City of Warrenton
Transportation System Plan

Prepared For:

Oregon Department of Transportation

Oregon State Highway Division

and

City of Warrenton

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"Making a difference through excellence of service"

CITY OF WARRENTON

Periodic Review Work Task No. 2 - Transportation Planning

MASTER ORIGINAL SUBMITTAL

Contents:

- Periodic Review Work Task Submittal Form *(Yellow Sheet)* with all Required Products;
- Ordinance No. 1064-A in its entirety;
- Findings of Fact and Agenda Memorandum;
- Written Testimony from Public Hearings;
- Updated Warrenton Development Code;
- Updated Warrenton Comprehensive Plan;
- February 2004 Warrenton Transportation System Plan;

City File No.: CPA-03-1
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Preface

The Warrenton Transportation System Plan (TSP) project was partially funded by a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. This TGM grant is financed, in part, by federal Transportation Equity Act for the 21st Century (TEA-21), local government, and the State of Oregon funds.

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Acronyms and Abbreviations

AAGR	average annual growth rate
AC	advisory committee
ADA	Americans with Disabilities Act
ADT	average daily traffic
ATR	Automated Traffic Recorder
AWSC	all-way, stop-controlled
CREST	Columbia River Estuary Study Taskforce
DAR	dial-a-ride
DEIS	Draft Environmental Impact Statement
DLCD	Department of Land Conservation and Development
DMV	Oregon Department of Motor Vehicles
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
GF	growth factor
HCM	Highway Capacity Manual
HOV	high occupancy vehicle
IM	interstate maintenance
IOF	Immediate Opportunity Fund
ITS	Intelligent Transportation System
LCDC	Land Conservation and Development Commission
LOS	level of service
MEV	million entering vehicles
MP	milepost
MPO	Metropolitan Planning Organization
mph	miles per hour
MUTCD	Manual on Uniform Traffic Control Devices
NHS	National Highway System

NWRC	Northwest Ride Center
OAR	Oregon Administrative Rule
OBPP	Oregon Bicycle and Pedestrian Plan
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
ORS	Oregon Revised Statute
OTIA	Oregon Transportation Investment Act
OTC	Oregon Transportation Commission
OTP	Oregon Transportation Plan
PMT	Project Management Team
SETD	Sunset Empire Transportation District
SPIS	Safety Prioritization Index System
STA	Special Transportation Area
STIP	Statewide Transportation Improvement Program
TDM	Transportation Demand Management
TPAU	Transportation Planning and Analysis Unit
TPR	Transportation Planning Rule
TSM	Transportation System Management
TSP	Transportation System Plan
TWSC	two-way stop control
UBA	urban business area
v/c	volume-to-capacity

SECTION 1

Introduction

The City of Warrenton, in conjunction with the Oregon Department of Transportation (ODOT), initiated a study of the City's transportation system in 2002. The Warrenton Comprehensive Plan is currently undergoing periodic review as required by state law. The transportation element (Goal 12) of the Warrenton Comprehensive Plan is a specified periodic review work task. The current transportation element does not address the City's obligation to meet state mandates, such as developing a Transportation System Plan (TSP) and associated implementing ordinances that comply with the Transportation Planning Rule (TPR). The City did develop and adopt a TSP in 1993. However, various state requirements that affect the development of TSPs, including the TPR, have been significantly amended since development of the 1993 Warrenton TSP.

The 2004 Warrenton TSP addresses ways to improve the transportation system to support anticipated growth in the City and associated traffic volumes in a way that will emphasize the local street network and protect the function of US 101 as a statewide highway. The TSP establishes a system of transportation facilities and services adequate to meet the City's transportation needs to the planning horizon year of 2022. The TSP plans for a transportation system that includes all modes of travel (that is, rail, pedestrian, bicycle, auto, marine, and public transportation), serves the entire urban area, and is well coordinated with the State, regional, and County transportation network.

The Warrenton TSP identifies planned transportation facilities and services needed to support planned land uses as identified in the City Comprehensive Plan in a manner consistent with the TPR (OAR 660-012) and the Oregon Transportation Plan (OTP). Preparation and adoption of a TSP for the City provides the following benefits:

- Assure adequate planned transportation facilities to support planned land uses during the next 20 years
- Provide certainty and predictability for the siting of new streets, roads, highway improvements and other planned transportation improvements
- Provide predictability for land development
- Help reduce the cost and maximize the efficiency of public spending on transportation facilities and services by coordinating land use and transportation decisions

This TSP will guide the management and development of appropriate transportation facilities in Warrenton, incorporating the community's vision, while remaining consistent with State, regional, and other local plans. This report provides the necessary elements to be adopted as the transportation element of the City's comprehensive plan.

The Warrenton TSP addresses ways to improve the transportation system to support anticipated growth throughout the City. The TSP considered future traffic volumes and circulation patterns in a way that emphasizes the City and County street network and

protects the function of the primary state highway corridor serving Warrenton; US 101. This TSP pays particular attention to the tourist and recreational aspects of the area and the transportation conditions created by the unique traffic characteristics. The TSP establishes a system of transportation facilities and services adequate to meet Warrenton's transportation needs to the planning horizon year of 2022. The TSP includes plans for a transportation system that incorporates all modes of travel (that is, rail, pedestrian, bicycle, auto, marine, and public transportation), serves the urban area, and is coordinated with the State, regional, and County transportation network.

Specific elements of the Warrenton TSP include:

- A street network with connections and extensions to provide for local circulation and access off of US 101
- Street standards that comply with the TPR
- Appropriate improvements along the primary City, County and State highway corridors that serve Warrenton to support planned land uses and measures to protect the long-term functionality of US 101
- Pedestrian and vehicle circulation improvements to reduce the need for short car trips on State highways and improve pedestrian safety throughout the planning area
- Amendments to the City's Development Code and other land use-related ordinances; the comprehensive plan; and any relevant financing plans, such as a capital improvement plan or other similar documents

The contents of the Warrenton TSP are guided by Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCD) administrative rule known as the Transportation Planning Rule (TPR). These laws and rules require that jurisdictions develop the following:

- A road plan for a network of arterial and collector streets
- A public transit plan
- A bicycle and pedestrian plan
- An air, rail, water, and pipeline plan
- A transportation financing plan
- Policies and ordinances for implementing the transportation system plan

The TPR requires that alternative travel modes be given equal consideration with the automobile, and that reasonable effort be applied to the development and enhancement of the alternative modes in providing the future transportation system. In addition, the TPR requires that local jurisdictions adopt land use and subdivision ordinance amendments to implement the provisions of the TSP. Finally, local communities must coordinate their respective plans with the applicable County, regional, and State transportation plans. This coordination occurred throughout the preparation of the Warrenton TSP.

Preparation of the Warrenton TSP also was guided by an Intergovernmental Agreement (IGA) entered into by Warrenton and ODOT to address capacity and access issues on US 101. The IGA was signed in January 2001 and provides direction regarding access and traffic

signalization on US 101. The principles of the IGA have been incorporated into the Warrenton TSP.

Plans and Policies

Several jurisdictions own the public roadways serving Warrenton. The Federal Government, ODOT, Clatsop County, and Warrenton all have jurisdiction over specific roadways within the City limits. These jurisdictions have plans and policies that directly affect transportation planning and decision making in Warrenton. One of the first steps in the TSP process was to review the following documents to serve as the basis for updating policies to reflect current conditions and to achieve consistency with other local, regional and State plans.

Federal

- General Management Plan, Development Concept Plans, Final Environmental Impact Statement for Fort Clatsop National Memorial (U.S. Department of the Interior, National Park Service) (1995)

State/ODOT

- Transportation Planning Rule (OAR 660-12)
- Oregon Transportation Plan (1992)
- Oregon Aviation Plan (2000)
- Oregon Bicycle and Pedestrian Plan (1995)
- Draft 2001 Oregon Rail Plan
- 1995 Oregon Transportation Safety Action Plan
- 1997 Oregon Public Transportation Plan
- 1999 Oregon Highway Plan
- 2002-2005 Statewide Transportation Improvement Program
- Executive Order No. EO-00-07, Development of a State Strategy Promoting Sustainability in Internal State Government Operations (2000)
- Executive Order No. EO-00-23, Use of State Resources to Encourage the Development of Quality Communities (2000)
- Access Management Rules (OAR 734-051)
- Freight Moves the Oregon Economy (1999)
- Proposed Oregon Coast Highway Corridor Master Plan (1995)
- Pacific Coast Scenic Byway Corridor Management Plan for US 101 in Oregon (1997)
- Portland – Astoria (US 30) Corridor Plan (1999)

- US 101 – Warrenton Vicinity Transportation Planning Study (Camp Rilea Road to Youngs Bay Bridge) (1993)

Sunset Empire Transit District

- Sunset Empire Transportation District Strategic Plan (2001)

Clatsop County

- Clatsop County Comprehensive Plan Goals and Policies (1994)
- Clatsop County Bicycle Plan (1993)
- Astoria Airport Master Plan (Port of Astoria) (2001)
- Columbia River Estuary Study Taskforce (CREST) Memorandum: Amended Clatsop County Population Projections with 2000 US Census Information (2001)
- Extended Bypass Alignment Study, Astoria, Oregon (1999)

City

- City of Warrenton Comprehensive Plan (1993)
- City of Warrenton Zoning Ordinance
- City of Warrenton Transportation System Plan (1993)
- Waterfront Revitalization Plan, Warrenton, Oregon (1994)
- City of Warrenton Community Visioning Project Summary Report (2001)
- City of Warrenton Draft Wetland Conservation Plan (1997)
- Intergovernmental Agreement: Warrenton: Traffic Signal Management on US 101 Within City Limits (2001)
- Cooperative Improvement Agreement Preliminary Engineering and Construction Finance (1989)
- Land Use Inventory and Analysis for the City of Warrenton (1998)
- Warrenton Property Zone Change Traffic Impact Study (1999)
- Warrenton Land & Investment Zone Change (2000)
- Skipanon Peninsula Rezone Traffic Impact Study (2001)

Public Involvement

The TSP planning process provided the citizens of Warrenton with the opportunity to identify priorities and provide input on future transportation projects in the County. The public involvement component of the Warrenton TSP consisted of two advisory committees and a community open house.

The project management team (PMT) included planners and representatives of Clatsop County, Warrenton, ODOT and DLCD. The PMT was responsible for reviewing technical aspects of the TSP. An Advisory Committee (AC) was made up of 10 residents representing a broad cross-section of the county population. The AC was responsible for evaluating the TSP from a policy perspective. This included reviewing the TSP goals and objectives, as well as the transportation evaluation criteria.

The two committees convened four times each during the process of developing the draft TSP, including: project kickoff, completion of the existing conditions analysis, presentation of the future conditions and alternatives analyses, and presentation of the draft TSP.

Two community open houses were designed as the primary public outreach tool for the TSP planning process and provided opportunities for the public to review TSP materials and to provide comments to the technical team preparing the TSP. The main objectives of the first open house were to gather community input for the development and evaluation of the proposed alternatives. A second open house was held in April of 2003 to review and gather public input on the draft TSP document.

Goals and Objectives

The formulation of goals and objectives represent an important component of the Transportation System Planning process. Goals and objectives are intended to reflect the vision and character of the City of Warrenton as the community develops its transportation system. The goals and objectives also are intended to implement and support the comprehensive plan.

The Warrenton TSP goals and objectives serve two main purposes: (1) to guide the development of the Warrenton transportation system during the next 20 years, and (2) to demonstrate how the TSP relates to other county, regional, and state plans and policies. The goal statements are general statements of purpose to describe how the City and the TSP intend to address the broad elements of the transportation system. The objectives are specific steps that illustrate how the goal is to be carried out.

The goals and objectives were formed as part of the Warrenton TSP planning process. They reflect the input of residents, businesses, and agencies that was obtained during the course of preparing the TSP. They also reflect current local, regional and State goals and policies, and are intended to support these policies. Transportation-related goals and objectives in the Warrenton Comprehensive Plan have been incorporated into the TSP goals and objectives.

Goal 1: Mobility

Develop a multimodal transportation system that serves the travel needs of Warrenton residents, businesses, visitors, and freight transport.

Objectives:

- Provide a network of arterials and collectors that are interconnected, appropriately spaced, and reasonably direct.

- Maintain functional classification standards and criteria.
- Balance the simultaneous needs to accommodate local traffic and through-travel.
- Minimize travel distances and vehicle-miles traveled.
- Safely, efficiently, and economically move motor vehicles, pedestrians, bicyclists, transit, trucks, and trains to and through Warrenton.
- Develop and adopt design standards for major collectors, minor collectors and arterials describing minimum right-of-way width, pavement, pedestrian service, bicycle travel, and other parameters.
- Encourage development patterns that offer connectivity and mobility options for members of the community.
- Work to enhance the connection of the Warrenton Harbor to the surrounding community.
- Recognize and balance freight needs with needs for local circulation, safety, and access.
- Recognize the need for sufficient parking for commercial development.
- Balance the need for truck access to industrial and waterfront areas with the desire for minimization of disruptions to downtown and commercial areas.
- Improve signage for streets, bicycle and pedestrian ways, and trails as well as directional signs to points of interest.
- Promote through-movement on US 101.

Goal 2: Livability

Provide a transportation system that balances transportation system needs with the community's desire to maintain a pleasant, economically viable city.

Objectives:

- Minimize adverse social, economic, and environmental impacts created by the transportation system, including balancing the need for street connectivity and the need to minimize neighborhood cut-through traffic.
- Preserve and protect the City's significant natural features and historic sites.
- Work to develop alternate transportation facilities that will allow development without major disruption of existing neighborhoods or the downtown area.

Goal 3: Coordination

Maintain a TSP that is consistent with the goals and objectives of Warrenton, Clatsop County, and the State.

Objectives:

- Provide a transportation system that is consistent with other elements and objectives of the Warrenton Comprehensive Plan and the City of Warrenton Community Visioning Project Summary Report (2001).
- Coordinate land use and transportation decisions to efficiently use public infrastructure investments to:
  - Maintain the mobility and safety of the roadway system
  - Foster compact development patterns
  - Encourage the availability and use of transportation alternatives
  - Enhance livability and economic competitiveness
- Cooperate with the City of Astoria, the Port of Astoria, and Clatsop County in establishing and maintaining zoning standards that will prevent the development of incompatible or hazardous uses around airports.
- Work to protect airspace corridors and airport approaches.
- Encourage and support the re-establishment of passenger service at the airport.
- Coordinate with the U.S. Army Corps of Engineers and the Oregon Division of State Lands to maintain appropriate operating depths at marina facilities, and identify beneficial uses of dredged material resulting from maintenance dredging.
- Support expansion of local boating and shipping activities, including the development of waterfront development activities along the Skipanon River, Youngs Bay, and Alder Cove.
- Work to expand the commercial boat moorage and facilities at the Warrenton Boat Basin as appropriate.

Goal 4: Public Transportation

Work to improve cost-effective and safe public transportation through and within Warrenton.

Objectives:

- Encourage a carpooling program for City employees and others to increase vehicle occupancy and minimize energy consumption.
- Work with the Sunset Empire Transportation District (SETD) to develop transit systems and stations and related facilities in convenient and appropriate locations that adequately and efficiently serve resident and employee needs.
- Work to improve the signage and amenities at transit stops and stations.
- Work with SETD to expand transit service as necessary during summer months of peak travel.

Goal 5: Pedestrian and Bicycle Facilities

Provide for an interconnected system of pedestrian and bicycle facilities in Warrenton to serve commuters and recreational users.

Objectives:

- Work to develop safe, connected pedestrian and bicycle facilities near schools, high-density residential districts, commercial districts, and waterfront areas.
- Develop bicycle lanes or shoulder bikeways on all arterial streets, major collectors, and minor collectors.
- Adopt, implement, and maintain appropriate design and construction standards for pedestrian access in new subdivisions, office parks, shopping centers, and public building developments.
- Ensure adequate pedestrian access on all streets in commercial zones.
- Use unused rights-of-way for greenbelts, walking trails, or bike paths where appropriate.
- Improve public access to the waterfront and trails along the waterfront.
- Establish an interconnected trail system that connects neighborhoods, the downtown area, and the waterfront, using old railway right-of-ways where appropriate and signage to indicate trail access points.
- Promote multimodal connections where appropriate.
- Promote increased bicycle awareness and support safety education and enforcement programs.
- Support and encourage increased levels of bicycling and walking.
- Develop safe and convenient pedestrian and bicycle systems that link all land uses, provide connections to transit facilities, and provide access to publicly owned land intended for general public use, such as the beach or park facilities.
- Adopt and maintain development standards that support pedestrian and bicycle access to commercial and industrial development, including (but not limited to) direct pathway connections, bicycle parking facilities, and signage where appropriate.

Goal 6: Accessibility

Provide a transportation system that serves the needs of all members of the community.

Objectives:

- Coordinate with SETD to encourage programs that serve the needs of the transportation disadvantaged.

- Provide for the transportation disadvantaged by complying with State and Federal regulations and cooperating with SETD and other agencies to provide transportation services for the disadvantaged.
- Upgrade existing transportation facilities and work with public transportation providers to provide services that improve access for all users.

Goal 7: Environment

Provide a transportation system that balances transportation services with the need to protect the environment and significant natural features.

Objectives:

- Promote a transportation system that encourages energy conservation, in terms of efficiency of the roadway network and the standards developed for street improvements.
- Encourage use of alternative modes of transportation and encourage development that minimizes reliance on the automobile.
- Work to balance transportation needs with the preservation of significant natural features and viewsheds.
- Work to minimize transportation impacts on beach/dune areas.
- Minimize transportation impacts on wetlands and wildlife habitat and promote the protection of rare and endangered plant and animal species.

Goal 8: System Preservation

Work to ensure that development does not preclude the construction of identified future transportation improvements, and that development mitigates the transportation impacts it generates when appropriate.

Objectives:

- Require developers to aid in the development of the transportation system by dedicating or reserving needed rights-of-way, by constructing half- or full-street improvements needed to serve new development, and by constructing off-street pedestrian, bicycle and transit facilities when appropriate.
- Consider transportation impacts when making land use decisions, and consider land use impacts (in terms of land use patterns, densities, and designated uses) when making transportation-related decisions.
- Ensure that development does not preclude the construction of identified future transportation improvements.
- Discourage through-traffic and high speeds in residential areas.

Goal 9: Capacity

Provide a transportation system that has sufficient capacity to serve the needs of all users.

Objectives:

- Protect capacity on existing and improved roads to provide acceptable service levels to accommodate anticipated demand.
- Limit access points on highways and major arterials, and use techniques such as alternative access points when possible to protect existing capacity.
- Minimize direct access points onto arterial rights-of-way by encouraging common driveways or frontage roads.
- Update and maintain City access management standards to preserve the safe and efficient operation of roadways, consistent with functional classification.
- Establish and maintain access spacing standards to protect capacity.
- Consider acceleration/deceleration lanes and other special turning lanes for capacity maintenance where appropriate.

Goal 10: Transportation Funding

Provide reasonable and effective funding mechanisms for City transportation improvements identified in the TSP.

Objectives:

- Develop a financing program that establishes transportation priorities and identifies funding mechanisms for implementation.
- Develop and implement a transportation impact fee program to collect funds from new developments to be used for offsite and onsite transportation improvements.
- Identify funding opportunities for a range of projects, and coordinate with County, State, and Federal agencies.

Goal 11: Safety

Provide a transportation system that maintains adequate levels of safety for all users.

Objectives:

- Undertake, as needed, special traffic studies in problem areas, especially around schools, to determine appropriate traffic controls to effectively and safely manage vehicle and pedestrian traffic.
- Work to improve the safety of rail, bicycle, and pedestrian routes and crossings.
- Identify safe connections for vehicles, bicycles, and pedestrians across US 101.
- Coordinate lifeline and tsunami/evacuation routes with local, State and private entities.

SECTION 2

Existing Transportation Conditions

This section summarizes the state of existing transportation conditions in Warrenton, Oregon. For more information, see the Warrenton Transportation System Plan Supplemental Background Document (CH2M HILL, January 2003) (referred to from this point forward as the Background Document). The inventory of existing transportation conditions in Warrenton will serve as a baseline for the 20-year planning horizon. The following elements of the existing transportation system are discussed in this section:

- Land Use
- Roadway Inventory
- Traffic Operations Analysis
- Safety Analysis
- Public Transportation Inventory
- Pedestrian and Trail System Inventory
- Bicycle System Inventory
- Air, Rail, Water, and Pipeline Transportation Inventory

Land Use and Zoning

Warrenton is located in the northwest corner of Oregon along the Columbia River and the Pacific Ocean, with a population of 4,280 in 2002 as reported by the Portland State University Population Research Center. Warrenton is connected with the nearby communities of Astoria and Seaside by US 101 and to Portland by US 26 and US 30. Warrenton serves a variety of transportation needs through a system that includes roads, public transportation amenities, pedestrian and bicycle facilities, an airport, two mooring basins, and pipelines. The study area for this project includes all areas within the City limits, including the Hammond area. Hammond is within the city limits of Warrenton because the two communities merged in 1991. Figure 2-1 shows the study area.

Warrenton includes approximately 11,780 acres of land within the urban growth boundary. Table 2-1 summarizes the approximate acreage of existing zoning in Warrenton, which is presented in Figure 2-2.

TABLE 2-1
Existing Zoning in Warrenton

Land Use Type	Acres
Commercial	600
URR	370
Industrial	1,910
OSI	1,330
Residential	2,640

Commercial development within Warrenton is concentrated downtown along Fort Stevens Highway 104, where several retail shops are located; at the regional commercial center located off US 101 at SE Marlin Avenue (Warrenton-Astoria Highway 105) and SE Neptune Avenue, which includes several regional or national chains such as Costco and Fred Meyer; along East Harbor Drive; and, along Fort Stevens Highway 104 in the Hammond area.

Industrial development is primarily located in the southeastern portion of Warrenton (east of US 101 near the Astoria Regional Airport and SE Dolphin Avenue) and in the north-central portion of Warrenton (off NE Skipanon Drive near the Skipanon Waterway and Warrenton Mooring Basin), and further north along Fort Stevens Highway 104 adjacent to the Columbia River.

Residential development in the City of Warrenton is concentrated in the Hammond area (located off Fort Stevens Highway 104) and in areas located directly to the south, west, and north, and within about one mile, of the Warrenton downtown area. There are also several newer housing developments located off DeLaura Beach Lane and Ridge Road. Warrenton has two schools, including the Warrenton High School located along Fort Stevens Highway 104, and the Warrenton Elementary School located off SW 9th Street, west of Fort Stevens Highway 104.

Warrenton contains significant amounts of open space within its boundaries. Fort Stevens State Park is located in the northwest corner of Warrenton, and Columbia Beach is also located to the west of Ridge Road, adjacent to the Pacific Ocean. Warrenton also contains several city parks, including Eben Carruthers Park off Fort Stevens Highway 104 along the Columbia Rive near Hammond, the central City Park to the west of downtown, and the 2nd Street Park/Kayak Dock located just east of downtown along the Skipanon River.

The Warrenton area contains many water features, including the Pacific Ocean, Columbia River, Skipanon River, Alder Creek, Tansy Creek, several sloughs and coastal lakes, and multiple wetlands, which affect the pattern of development in Warrenton. The Hammond and Warrenton Marinas are both functional.

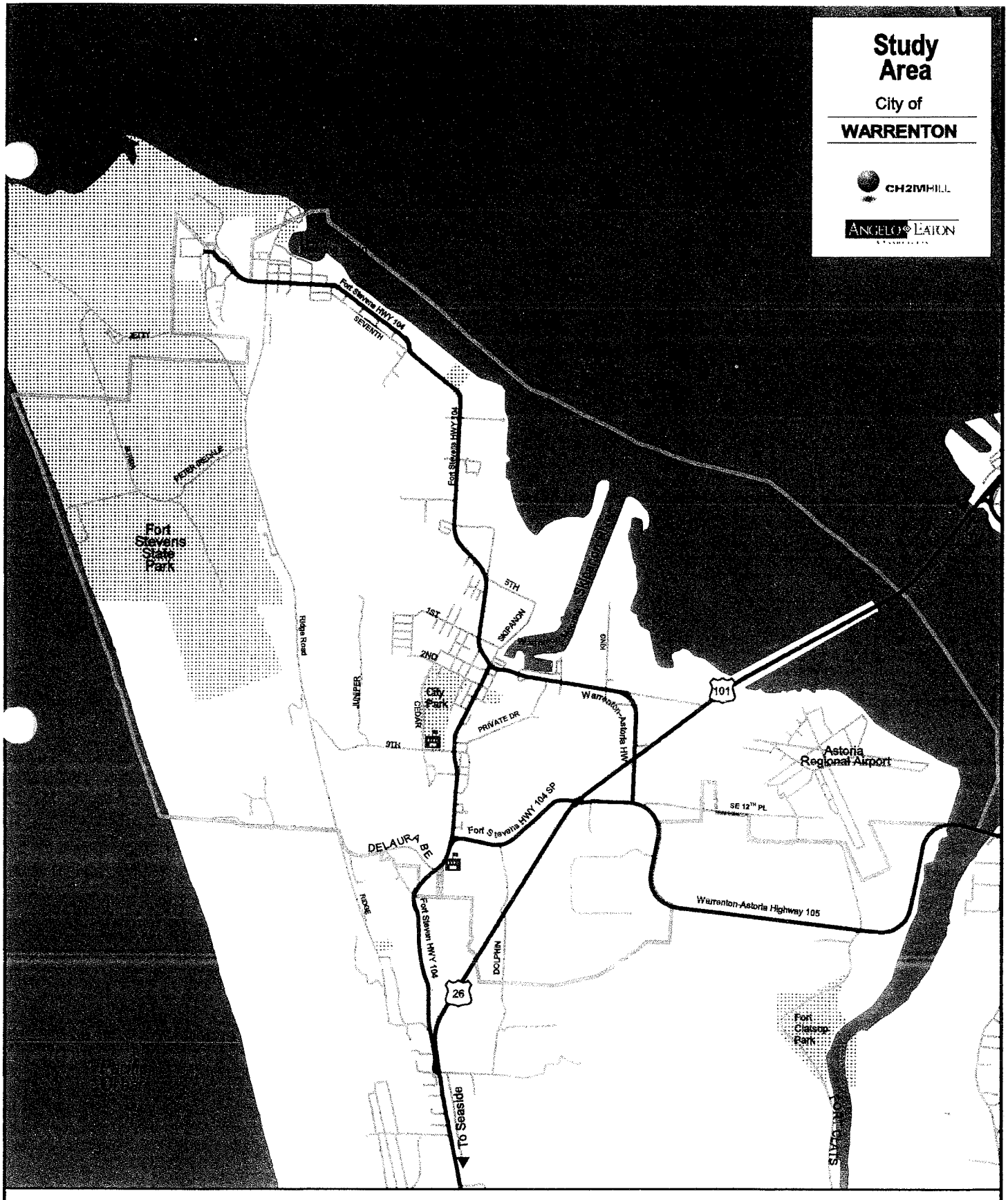
Roadway Inventory

Within Warrenton, the following roadway characteristics were inventoried:

- Maintenance and jurisdiction
- Functional classification
- Pavement type (asphalt, concrete, gravel)
- Pavement condition (good, fair, typical local)
- Number of travel lanes
- Intersection control
- Access management
- Parking
- Truck routes
- Lifeline routes
- Beach access points

Maintenance and Jurisdiction

Within Warrenton there is a mixture of road ownership, including roads owned by ODOT, Clatsop County, and Warrenton as shown in Figure 2-3.



File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:16, User: JGATES2, Figure 2-1 - Study Area

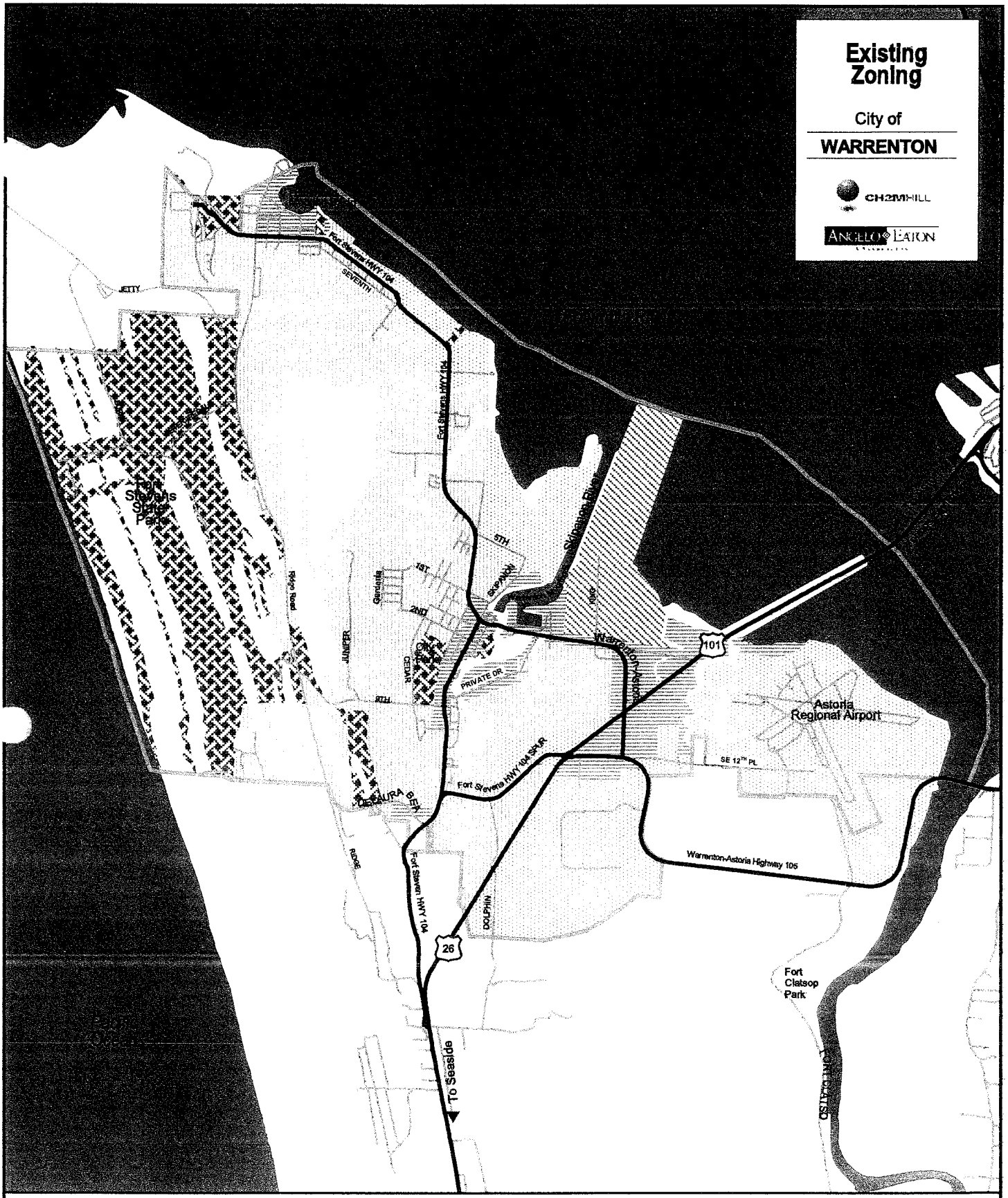
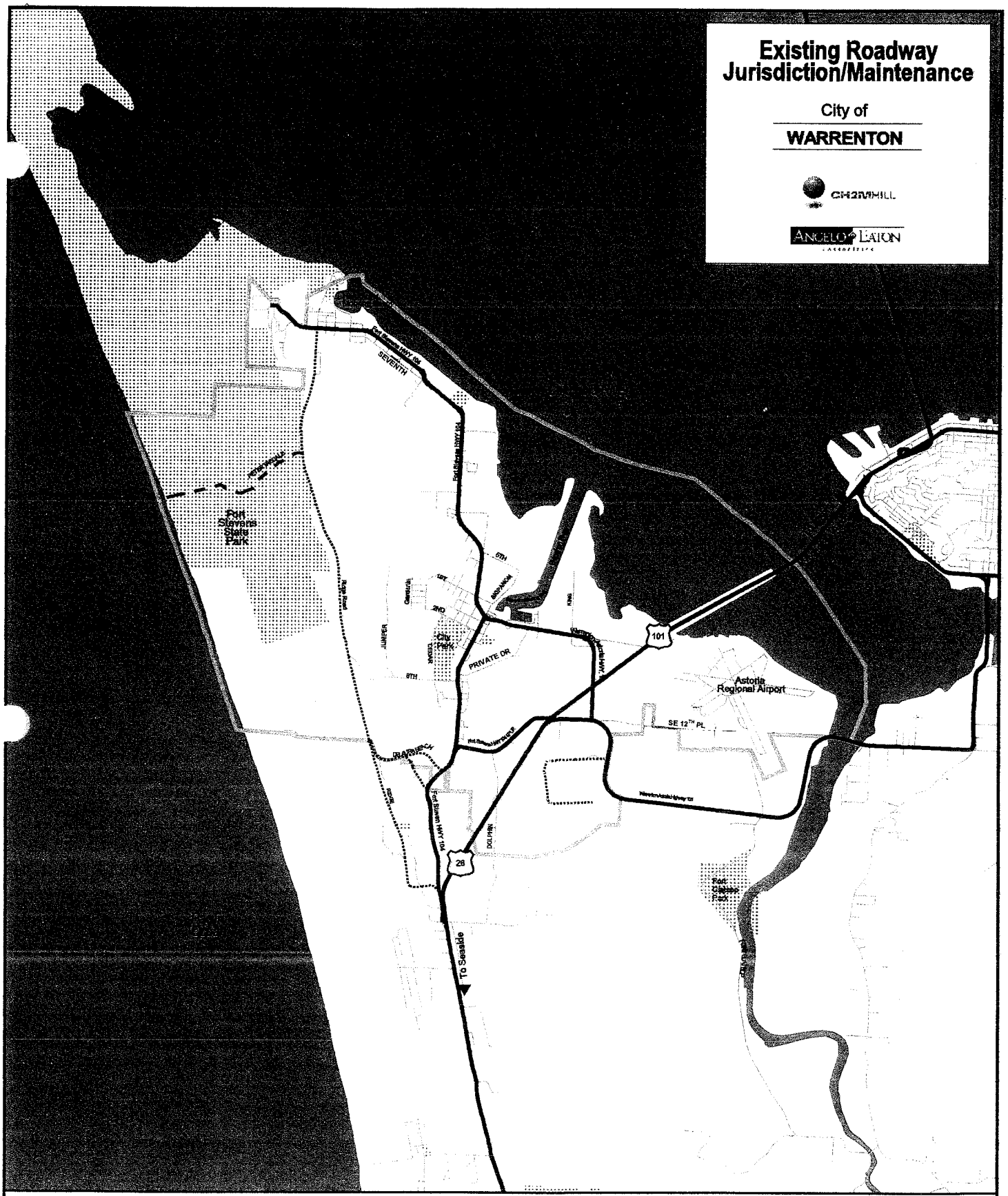


Figure 2-2
Transportation System Plan
Warrenton, OR

File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 14 May 2003 8:42, User: JGATES2, Figure 2-2 - Existing Zoning



File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:21, User: JGATES2, Figure 2-3 - Existing Jurisdiction

ODOT maintains and has jurisdiction over the following roads:

- **US 101** (also known as the Oregon Coast Highway)
- **Fort Stevens Highway 104** (known locally as Main Avenue, NW Warrenton Drive, and Pacific Drive)
- **Fort Stevens Highway 104 Spur** (also known as Alternate Highway 101)
- **Warrenton-Astoria Highway 105** (including East Harbor Drive, SE Marlin Avenue, US 101 Business, and a portion of Alternate Highway 101)

Clatsop County maintains and has jurisdiction over the following roads:

- **Ridge Road**
- **Whiskey Road**
- **SE 19th Street** off Warrenton-Astoria Highway 105 (also identified as the **North Coast Business Park Road**)
- **DeLaura Beach Lane** from Ridge Road to Fort Stevens Highway 104

The City of Warrenton maintains and has jurisdiction over all roads not mentioned above except for private streets and driveways that have not been formally accepted into the City's maintenance program.

In an amendment to the Warrenton Urban Growth Boundary Management Agreement signed in 1999, Clatsop County transferred jurisdiction and maintenance of Airport Road and Dolphin Road to the City of Warrenton. DeLaura Beach Lane (west of Ridge Road) was transferred to the City of Warrenton in 2003. The jurisdiction, maintenance, and upgrade of Peter Iredale Road is covered under an intergovernmental agreement between Clatsop County, the City of Warrenton, and the Oregon Parks and Recreation Department.

Existing Functional Classification

ODOT has identified the functional classification of roadways within Warrenton. The proper classification of each roadway is important to help determine the appropriate traffic control, design standards, pedestrian and bicycle facilities, and access to adjacent properties for a roadway segment. Figure 2-4 includes the following functional classifications for existing conditions within Warrenton:

- **Arterial Roadways.** The primary function of an arterial roadway is to provide mobility. Therefore, arterials typically carry higher traffic volumes and allow higher travel speeds while providing limited access to adjacent properties. Within Warrenton, US 101 is the only designated principal arterial.

- **Collector Roadways.** The function of a collector roadway is to collect traffic from local streets and provide connections to arterial roadways. Generally, collectors operate with moderate speeds and provide more access in comparison to arterials. Within Warrenton, Ridge Road and DeLaura Beach Lane (between Ridge Rd. and Hwy 104) are designated by ODOT as rural major collectors. Fort Stevens Highway 104, Fort Stevens Highway 104 Spur, East Harbor Drive, and Warrenton-Astoria Highway 105 are designated as urban collectors.

- **Local Roadways**. The primary function of a local roadway is to provide access to local traffic and route users to collector roadways. Generally, local roadways operate with

low speeds, provide limited mobility, and carry low traffic volumes in comparison to other roadway classifications. Within Warrenton, all roadways not mentioned above are designated as local roads by ODOT.

ODOT classifies only roadways of statewide significance. Therefore, several roadway segments that are currently classified as local roadways by ODOT were identified as potential collectors by the Public Works Superintendent for Warrenton and the Warrenton Planning Director. These roadway segments are shown in Figure 2-4.

Pavement Type and Condition

Within Warrenton, most of the roadway segments have asphalt surfacing. However, a few sections of local roads have gravel surfacing and one section of road has concrete surfacing.

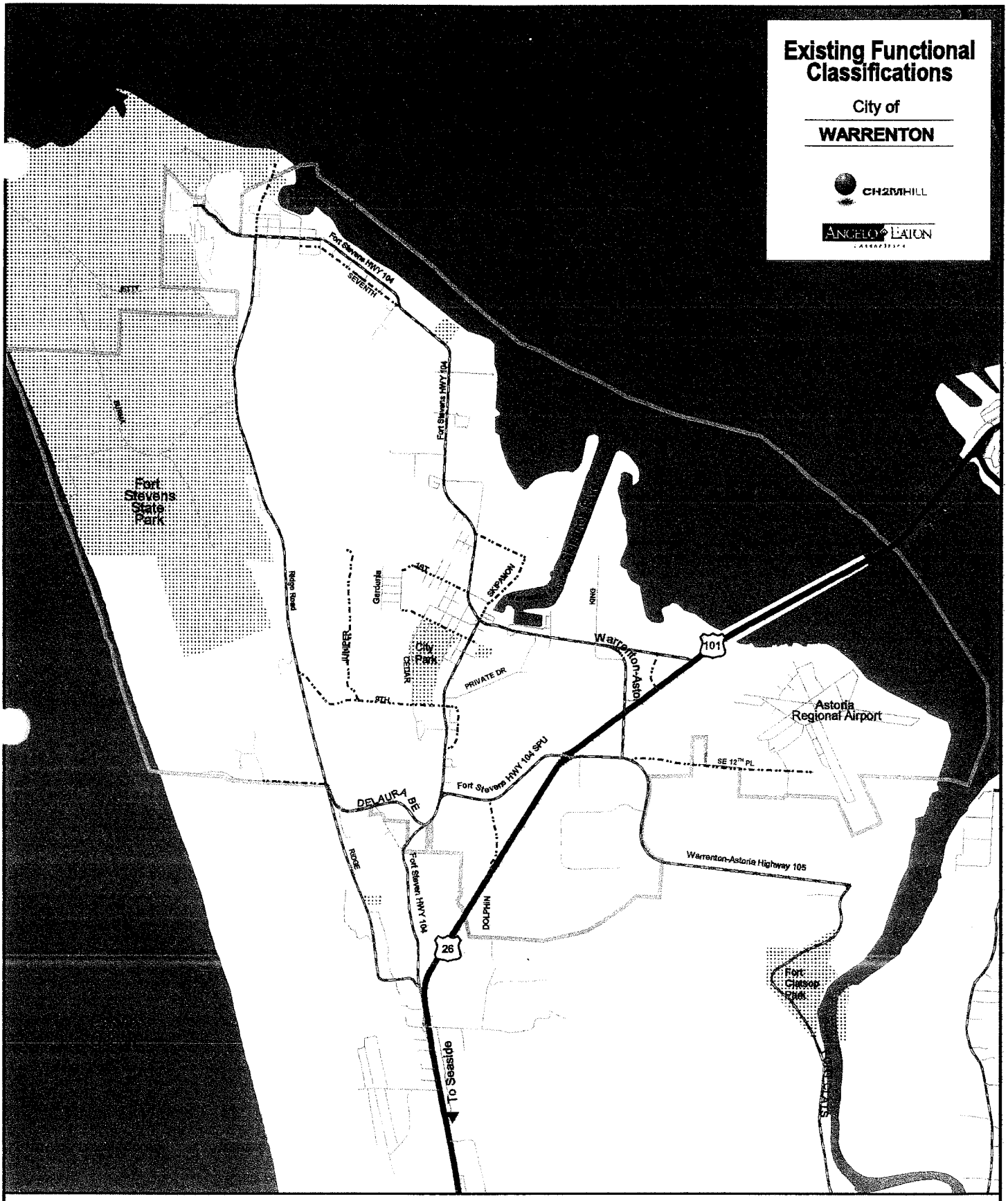
A visual inspection of pavement conditions was conducted for roads under jurisdiction of the City of Warrenton to determine which roads were in good, fair, and poor condition. Roads in good condition provided smooth driving conditions and were generally free of potholes, cracking, and maintenance issues. Roads in fair condition had sections of patching and short sections that require maintenance. Roads in poor condition provided a rough driving surface, with a majority of their length requiring maintenance because of potholes and cracking. Generally, the pavement condition of unimproved local roads within Warrenton was fair to poor and the condition of local roads with recent development including curb and sidewalk was good. On local road segments that serve low volumes of traffic at low operating speeds, improvements in pavement conditions may not be necessary.

As described in the 2001 Pavement Condition Report by ODOT and the Oregon Highway Plan (OHP), the state has a goal of maintaining a statewide pavement condition rating at 78 percent fair or better. Pavement conditions from December 2001 for roads under the jurisdiction of ODOT were obtained from the ODOT Web site (http://www.odot.state.or.us/tdmappingpublic/). The pavement condition of US 101 is good within the City limits of Warrenton. On Fort Stevens Highway 104, the pavement condition is generally fair, with a section in good condition between Fort Stevens Highway 104 Spur and Warrenton-Astoria Highway 105. The pavement condition of Warrenton-Astoria Highway 105 ranges from good to poor and the condition of Fort Stevens Highway 104 is poor.

Number of Travel Lanes and Roadway Width

Most roads in Warrenton allow two-way traffic with one lane in each direction. A few local roadway segments are one-lane roads. In addition, two or more lanes are provided in a few locations, including center turn lanes along US 101, SE Neptune Avenue, and Fort Stevens Highway 104. Two eastbound lanes are provided along East Harbor Drive from Neptune Drive to US 101.

According to the City of Warrenton Comprehensive Plan developed in 1993, minimum pavement widths for new or relocated streets are 40 feet for arterials, 36 feet for collectors and subcollectors, and 26 feet for minor streets. During the field visit to Warrenton, widths were not measured for each roadway in Warrenton. However, general observations were made relating to roadway width.



File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:21, User: JGATES2, Figure 2-4 - Functional Classification

Overall, the widths of most roads in Warrenton appeared to be close to the standards described above. Several local roads were identified in the existing conditions memorandum as one-lane roads, which do not meet the standards above. In addition, some of the potential collectors identified by City of Warrenton staff would not meet the standards described above (for example, SW 9th Street). Road widths and standards will be examined later in the development of the TSP for Warrenton.

Intersection Control

Within Warrenton, there are two existing signals at the following locations:

- US 101 and SE Neptune Avenue
- US 101 and East Harbor Drive

A third signal is scheduled to be installed at the intersection of US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105) in 2004.

Most intersections in Warrenton are two-way or one-way stop-controlled. There are four-way stop-controlled intersections within the project limits at the following locations:

- Fort Stevens Highway 104, Warrenton-Astoria Highway 105, and NE Skipanon Drive
- Peter Iredale Road and Fort Stevens Campground Loop Roads
- Fort Stevens Highway 104 and Ridge Road/Lake Drive
- First Avenue and Pacific Drive (Hammond)
- SW 9th Street and SW Cedar Avenue/Drive
- SW 2nd Street and SW Cedar Avenue

There is a three-way stop at the intersection of Cedar and 2nd Street.

Access Management

According to the OHP, access management is "balancing access to developed land while ensuring movement of traffic in a safe and efficient manner." The OHP states that the purposes of access management strategies include: ensuring safe and efficient roadways consistent with their determined function, ensuring the statewide movement of goods and services, enhancing community livability, supporting planned development patterns, and recognizing the needs of motor vehicles, transit, pedestrians, and bicyclists.

The State TPR requires that local governments adopt land use or subdivision ordinance regulations to protect transportation facilities for their identified functions, such as access control (OAR Section 660-12-0045(2)). Warrenton currently does not address access control measures in its zoning or subdivision/partition ordinances. This TSP process will address the State requirement for Warrenton access control standards.

Several collectors in Warrenton have multiple vehicle access points for access to local roads or private streets or driveways. Examples of roadways with frequent vehicle access points include Fort Stevens Highway 104, Fort Stevens Highway 104 Spur, and Warrenton-Astoria Highway 105 (East Harbor Drive and SE Marlin Avenue sections). Multiple access points can lead to increased opportunities for vehicle-vehicle conflicts as well as conflicts between vehicles and bicyclists or pedestrians. US 101 is access-controlled. The TSP will examine

where access control issues may affect the integrity of the transportation system in Warrenton.

During the field inventory, general observations were made about access management along each roadway segment:

- Highway 101 access points exist at intersections with SE Dolphin Avenue, Fort Stevens Highway 104 Spur, SE Marlin Avenue (Warrenton-Astoria Highway 105), SE Neptune Avenue, and East Harbor Drive. An access point also exists at the Premarq Center near the New Youngs Bay Bridge.
- Access points on collectors exist at intersections with local streets and private gravel driveways.
- Local streets provide frequent access points to private gravel driveways.

Parking

Within the downtown area of Warrenton, on-street parallel parking is allowed along Fort Stevens Highway 104. Parking is restricted to a 2-hour maximum and certain lengths are restricted to compact cars only. On-street parking is provided in residential areas.

Public parking lots are provided at the following locations:

- Peter Iredale Beach Access
- Warrenton and Hammond Mooring Basins
- Warrenton Community Center
- Soccer fields on Ridge Road
- Eben Carruthers Memorial Park
- Fort Stevens State Park and Museum

Truck Traffic

Warrenton has no designated truck routes. However, roadway segments near industrial areas are used more heavily by trucks. Industrial areas near Tansy Point, the Skipanon Waterway, and the Astoria Regional Airport generate significant truck traffic on the following local roadway segments:

- NW 13th Street
- NE 5th Street
- NE Skipanon Drive
- SE 12th Place (airport access road)
- SE Flight Line Drive

Significant truck traffic is also generated along SE Dolphin Avenue south of US 101.

Truck traffic generally continues from these industrial areas to roads under ODOT jurisdiction, including Fort Stevens Highway 104, Fort Stevens Highway 104 Spur, Warrenton-Astoria Highway 105, and US 101.

Lifeline Routes

Within Warrenton, several County and State roadways are designated as Priority 1 lifeline routes as shown in Figure 2-5, which means they are essential for emergency responses in the first 72 hours after an incident:

- US 101 south of Fort Stevens Highway 104 Spur
- Ridge Road between Hammond and DeLaura Beach Lane
- DeLaura Beach Lane between Ridge Road and Fort Stevens Highway 104
- Fort Stevens Highway 104 between DeLaura Beach Lane and US 101
- Fort Stevens Highway 104 Spur
- SE 12th Place/Airport Road in Warrenton

Beach Access Points

Public beach access points in Oregon have been inventoried and are summarized on the Inforain Web site (www.inforain.org). According to the Web site, there are four maintained beach access points in Warrenton. Maintained access points exist at Peter Iredale and Areas A through C in Fort Stevens State Park. Each of the maintained points has a paved parking lot and an unpaved path to the beach. See Figure 2-6 for the existing beach access points in Warrenton.

Existing Traffic Operations Analysis

The operational analysis of existing conditions (2002) was conducted for 12 intersections in Warrenton located on State, County, and City facilities. The analysis was conducted using peak-hour turn movement counts conducted in 2001, ODOT Future Volume Tables, and Automated Traffic Recorder (ATR) data. This section provides a summary of the operational analysis of existing conditions (2002). See the Background Document for further information on the methodology used to conduct the operational analysis of existing conditions.

Raw Intersection Traffic Counts

ODOT collected year 2001 traffic counts for 27 locations in the vicinity of Warrenton. The operational analysis of existing conditions focused on the 12 intersections shown in Table 2-2 with the highest entering volumes from the 2001 turn movement counts. The intersection of US 101, Fort Stevens Highway 104, and Perkins Lane is outside the City limits of Warrenton. However, because of its close proximity to Warrenton and impact on the transportation system in Warrenton, this intersection was included in the operational analysis.

TABLE 2-2
Highest Peak Hour Entering Volume at Warrenton Intersections

Intersection	Peak Hour Entering Volume (vehicles/hour)
US 101 and East Harbor Drive (Signalized)	2,200
US 101 and SE Neptune Avenue (Signalized)	1,656
US 101 and Fort Stevens Highway 104 and Perkins Lane	1,544
US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105)	1,532
US 101 and Fort Stevens Highway 104 Spur	1,329
US 101 and SE Dolphin Avenue	1,328
Fort Stevens Highway 104 and Warrenton-Astoria Highway 105	1,222
East Harbor Drive and SE Neptune Avenue	1,071
Warrenton-Astoria Hwy 105 (SE Marlin Ave) and E. Harbor Drive	970
Fort Stevens Highway 104 and Seventh Avenue (Hammond)	557
Fort Stevens Highway 104 and Lake Drive (Hammond)	481
Fort Stevens Highway 104 and DeLaura Beach Lane	445

Source: Year 2001 Traffic Counts

As noted in Table 2-2, the intersections of US 101 with East Harbor Drive and SE Neptune Avenue are signalized. All other intersections in Warrenton are currently unsignalized.

Average Daily Traffic Volumes

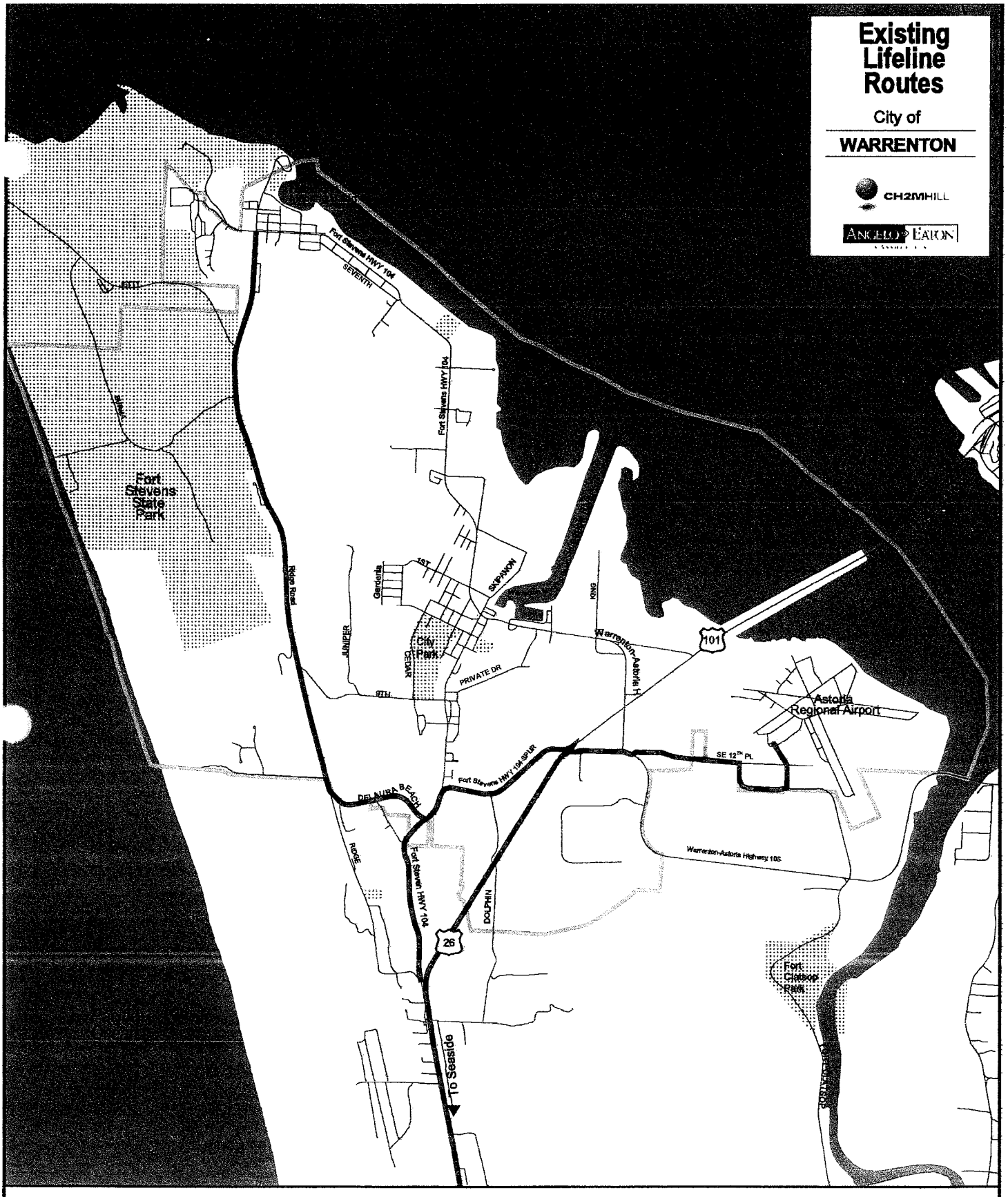
Year 2000 average daily traffic (ADT) volumes for US 101, Fort Stevens Highway 104, Fort Stevens Highway 104 Spur, and Warrenton-Astoria Highway 105 were obtained from the Transportation Volume Tables available on the ODOT Web site (http://www.odot.state.or.us/tdb/traffic_monitoring/tvtable.htm). Using the ADT volumes from ODOT tables and the traffic count volumes, ADT volumes were estimated for several locations in Warrenton, including Ridge Road, SE Neptune Avenue, DeLaura Beach Lane, and East Harbor Drive. See Figure 2-7 for existing ADT volumes in Warrenton, Oregon.

2002 Traffic Volumes

The analysis of existing conditions included the 12 study intersections shown in Table 2-2. To calculate 2002 peak-hour turn movements at each of the intersections, an average annual growth rate (AAGR) was applied to each year 2001 intersection turn movement count.

Analysis of the Automated Traffic Recorders

The TSP guidelines adopted by ODOT require that volume to capacity (v/c) ratios for intersections be calculated using 30th-highest-hourly traffic volumes. Within urban areas, 30th-highest-hourly traffic volumes typically occur during a weekday peak hour. In recreational areas such as the Oregon coast, 30th-highest-hourly traffic volumes typically occur during the peak tourist season. Therefore, 30th-highest-hour traffic volumes in Warrenton occur during summer months (July and August) during the peak tourist season.



File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:22, User: JGATES2, Figure 2-5 - Lifeline Routes

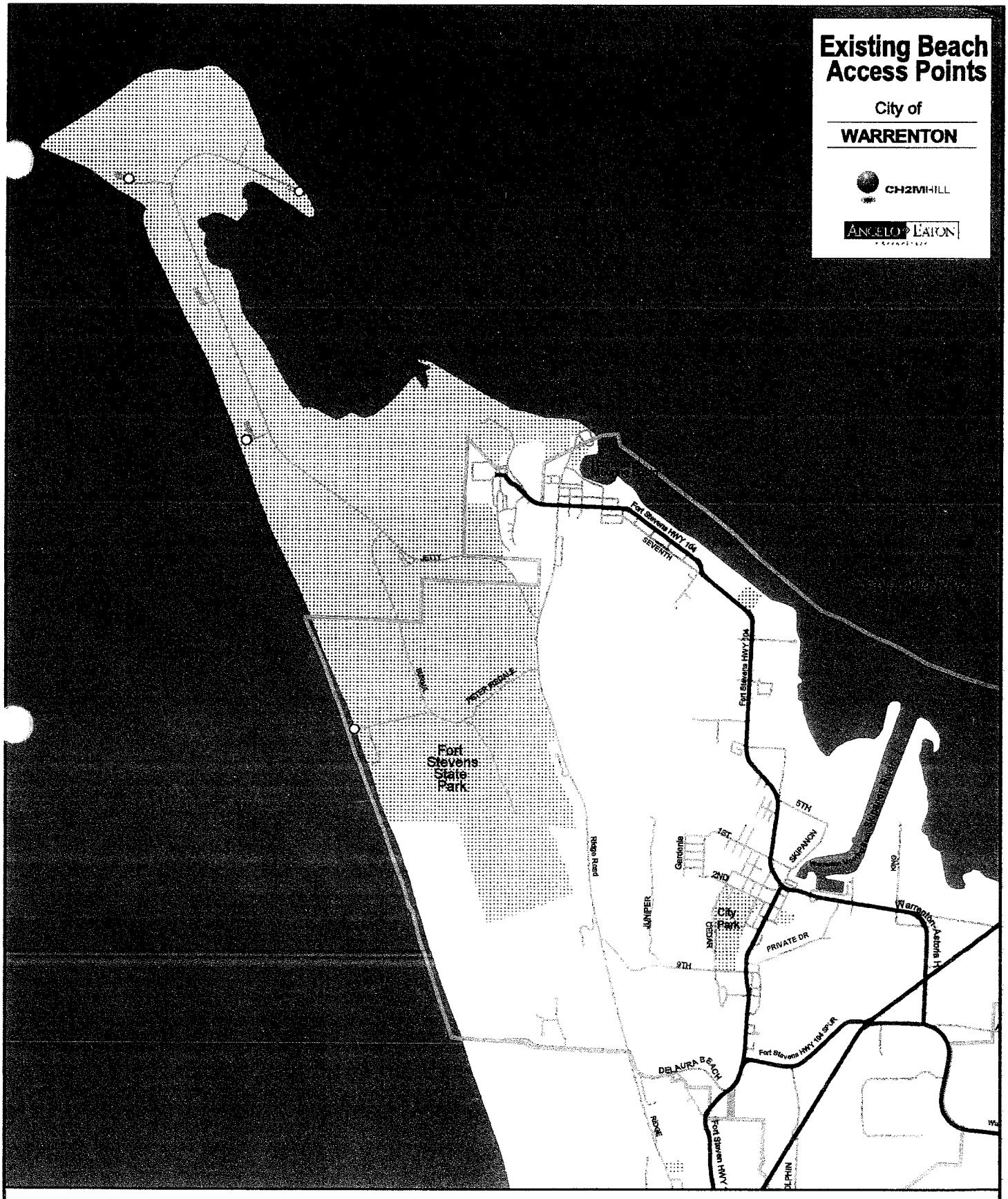


Figure 2-6
Transportation System Plan
Warrenton, OR

File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:22, User: JGATES2, Figure 2-6 - Beach Access Points

File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:22, User: JGATES2, Figure 2-7 - Existing ADT Volumes

2002 30th-Highest-Hour Traffic Volumes

The turn movement counts for intersections in Warrenton were conducted in July 2001. An analysis of the Gearhart ATR site, which is the closest ATR site to Warrenton along US 101, indicated the July 2001 counts were representative of 30th-highest-hour conditions along US 101. Therefore, the July counts were not adjusted to account for peak seasonal usage. Figure 2-8 presents the 2002 turn movement volumes used to analyze existing (2002) 30th-highest-hour conditions.

2002 Weekday, Peak-Hour Traffic Volumes

The analysis of 2001 data from the Gearhart ATR site demonstrates that traffic volumes increase by approximately 35 percent during weekends in August over average traffic volumes. Figure 2-9 demonstrates the variability in ADT volumes per month along US 101 as measured by the Gearhart ATR in 2001. To evaluate more typical operating conditions at intersections in the vicinity of US 101, weekday PM peak-hour volumes were calculated by reducing the 30th highest hour volumes by 35 percent. Figure 2-10 presents balanced weekday peak-hour volumes for intersections in the vicinity of US 101.

State Highway Mobility Standards

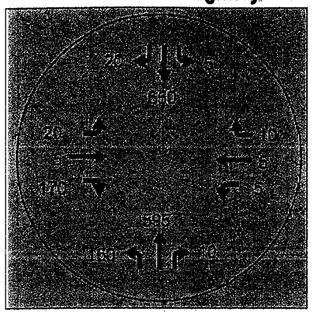
Eleven of the 12 intersections included in the operational analysis of existing conditions in Warrenton involve a State highway. The 1999 OHP designates US 101 as a Statewide NHS Non-Freight route. In Warrenton, the speed limit on US 101 is 45 miles per hour (mph), and the section of highway is inside the urban growth boundary in a non-Metropolitan Planning Organization (MPO) area. Therefore, the mobility standard designated by OHP for this section of roadway is a v/c ratio of less than 0.75. Fort Stevens Highway 104 and Warrenton-Astoria Highway 105 are district highways in a non-MPO area with speed limits of less than 45 mph. The mobility standard for these facilities designated in the OHP is a v/c ratio of less than 0.85. Table 2-3 displays OHP mobility standards for applicable facility types in Warrenton.

TABLE 2-3
Oregon Highway Plan Mobility Standards

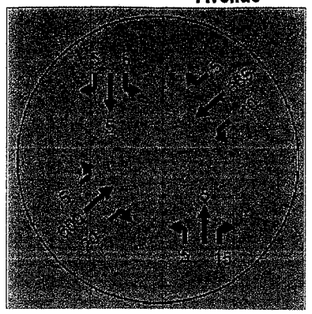
Highway Category	Mobility Standard (v/c ratio)
Statewide NHS Non-Freight Routes, Non-MPO Area (US 101)	0.75
District Highways, Non-MPO Area, Speed Less Than 45 mph (for example, Fort Stevens Highway 104)	0.85
Local Road Approaches with US 101	0.75
Local Road Approaches with District Highways, Inside Urban Growth Boundary	0.85
Local Road Approaches with District Highways, Outside Urban Growth Boundary	0.80

Source: Table 6 and Pages 74-79, Oregon Highway Plan.

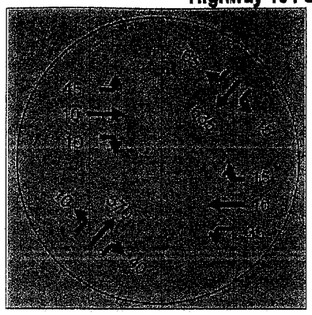
1 US 101 & Fort Stevens Highway 104



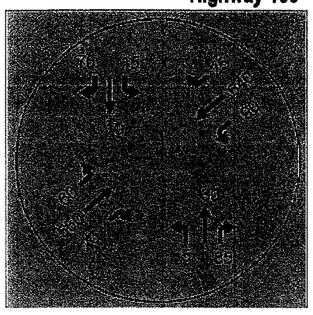
2 US 101 & Dolphin Avenue



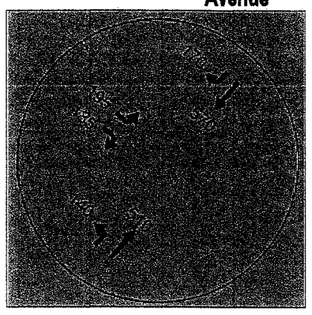
3 US 101 & Fort Stevens Highway 104 Spur



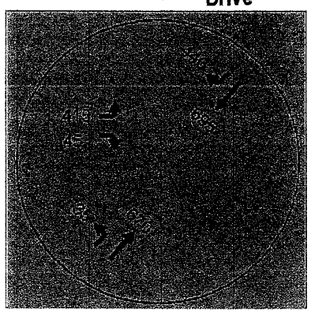
4 US 101 & Warrenton-Astoria Highway 105



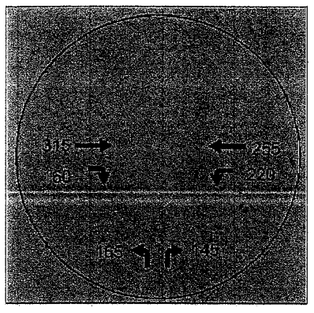
5 US 101 & Neptune Avenue



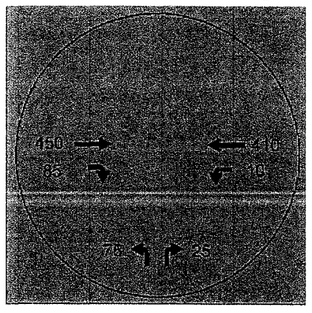
6 US 101 & Harbor Drive



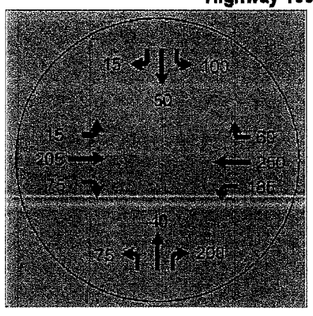
7 Harbor Drive & Neptune Avenue



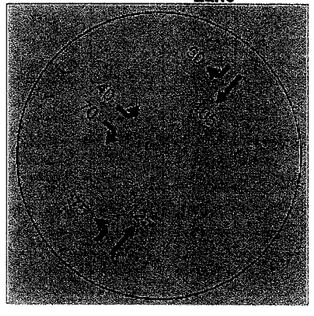
8 Warrenton-Astoria Highway 105 & Harbor Drive



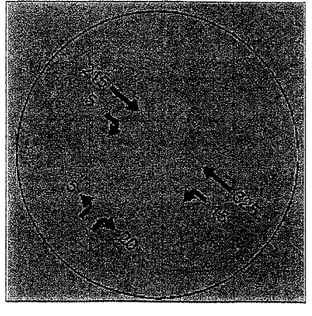
9 Fort Stevens Highway 104 & Warrenton-Astoria Highway 105



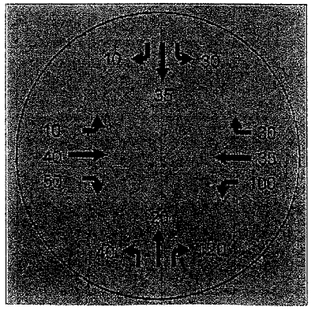
10 Fort Stevens Highway 104 & Delaura Beach Lane

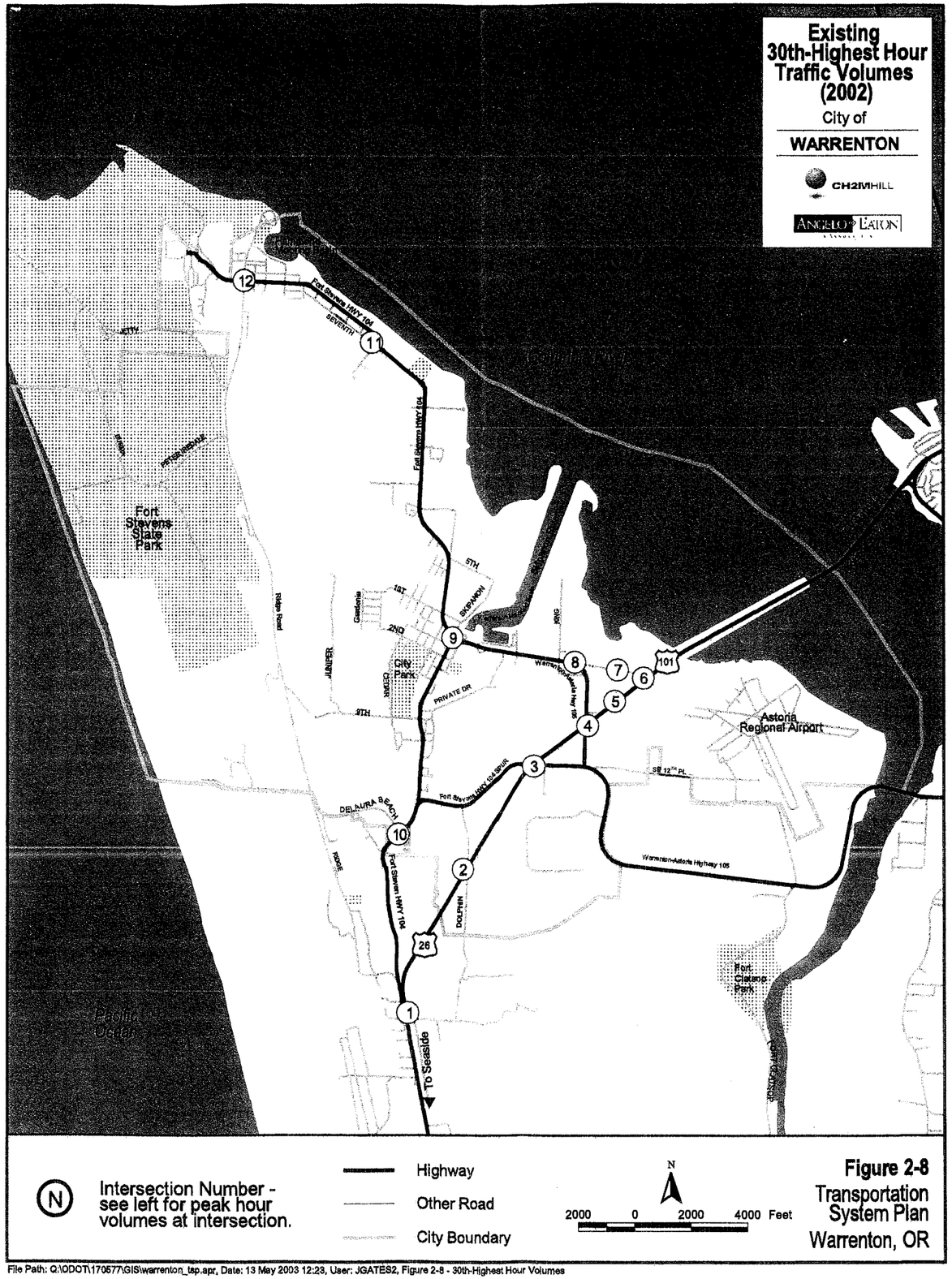


11 Fort Stevens Highway 104 & Seventh Ave



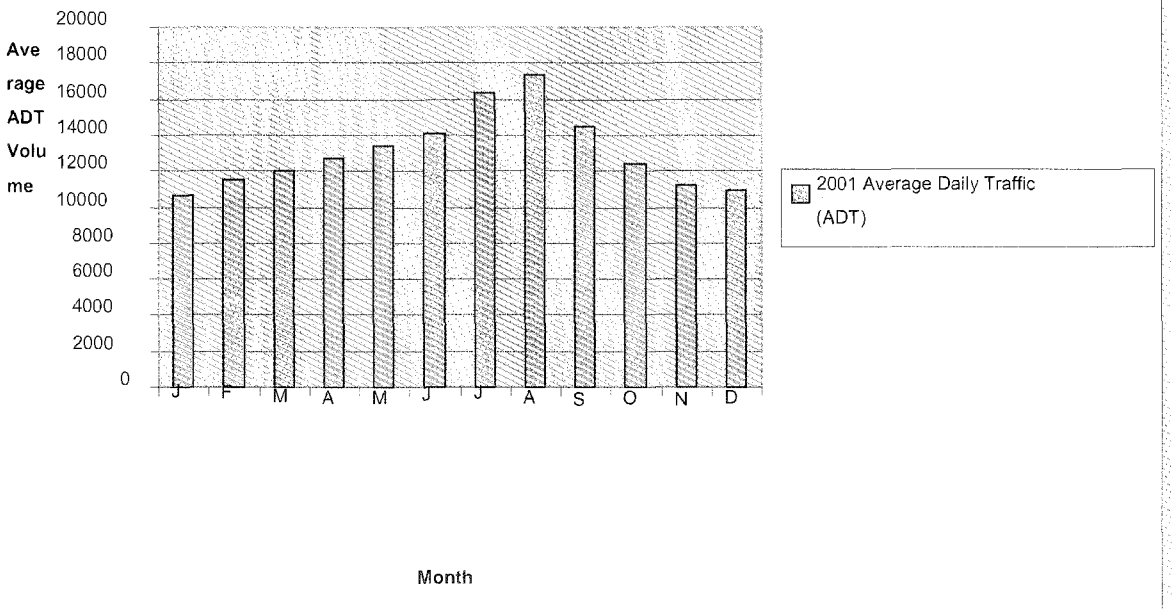
12 Fort Stevens Highway 104 & Lake Drive





File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:23, User: JGATES2, Figure 2-8 - 30th-Highest Hour Volumes

Figure 2-9 - 2001 ADT Volumes at Gearhart ATR by Month



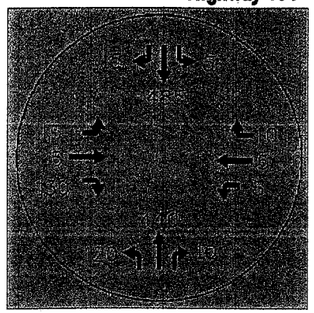
In Warrenton, there are several unsignalized intersections of US 101, Fort Stevens Highway 104, and Warrenton-Astoria Highway 105 with local roads. The OHP designates a maximum v/c ratio of 0.85 for local road approaches within the urban growth boundary (non-MPO areas, speed limit of less than 45 mph) and a maximum v/c ratio of 0.80 for local road approaches outside of the urban growth boundary. For signalized intersections of US 101 with local roads, the OHP designates that the maximum v/c ratio on the local approach is equal to the mobility standard designated for US 101.

Level of Service Analysis

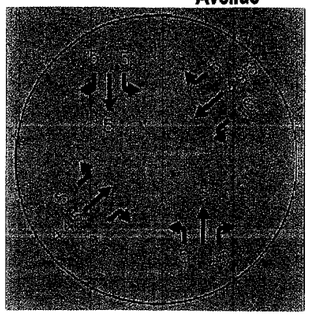
Level of service (LOS) is a measure of effectiveness for traffic operations at an intersection. Traffic is able to move freely at an intersection operating at LOS A, B, or C. Traffic operations become progressively worse as traffic operations move toward LOS D and E. LOS F represents conditions where traffic volumes exceed capacity, resulting in long queues and delays.

LOS is based on control delay time at an intersection for both signalized and unsignalized intersections. Table 2-43 summarizes the range of control delay times for each at signalized and unsignalized intersections and shows that for equivalent LOS ratings, signalized intersections have greater maximum delay thresholds than unsignalized intersections.

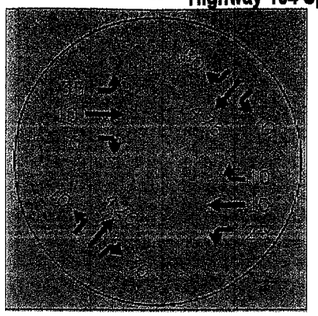
1 **US 101 & Fort Stevens Highway 104**



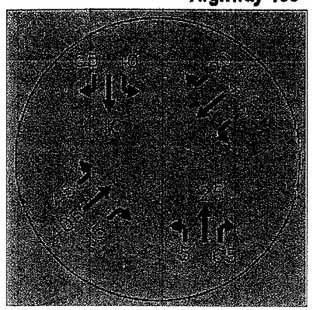
2 **US 101 & Dolphin Avenue**



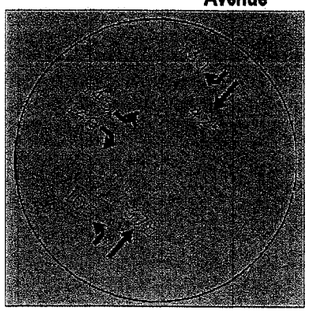
3 **US 101 & Fort Stevens Highway 104 Spur**



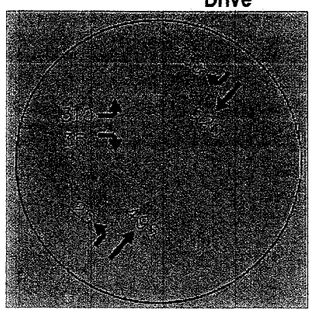
4 **US 101 & Warrenton-Astoria Highway 105**



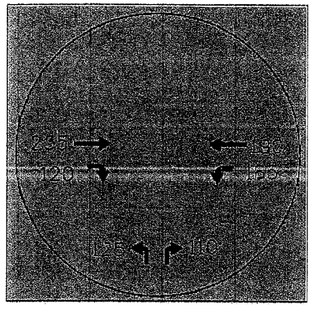
5 **US 101 & Neptune Avenue**



6 **US 101 & Harbor Drive**



7 **Harbor Drive & Neptune Avenue**



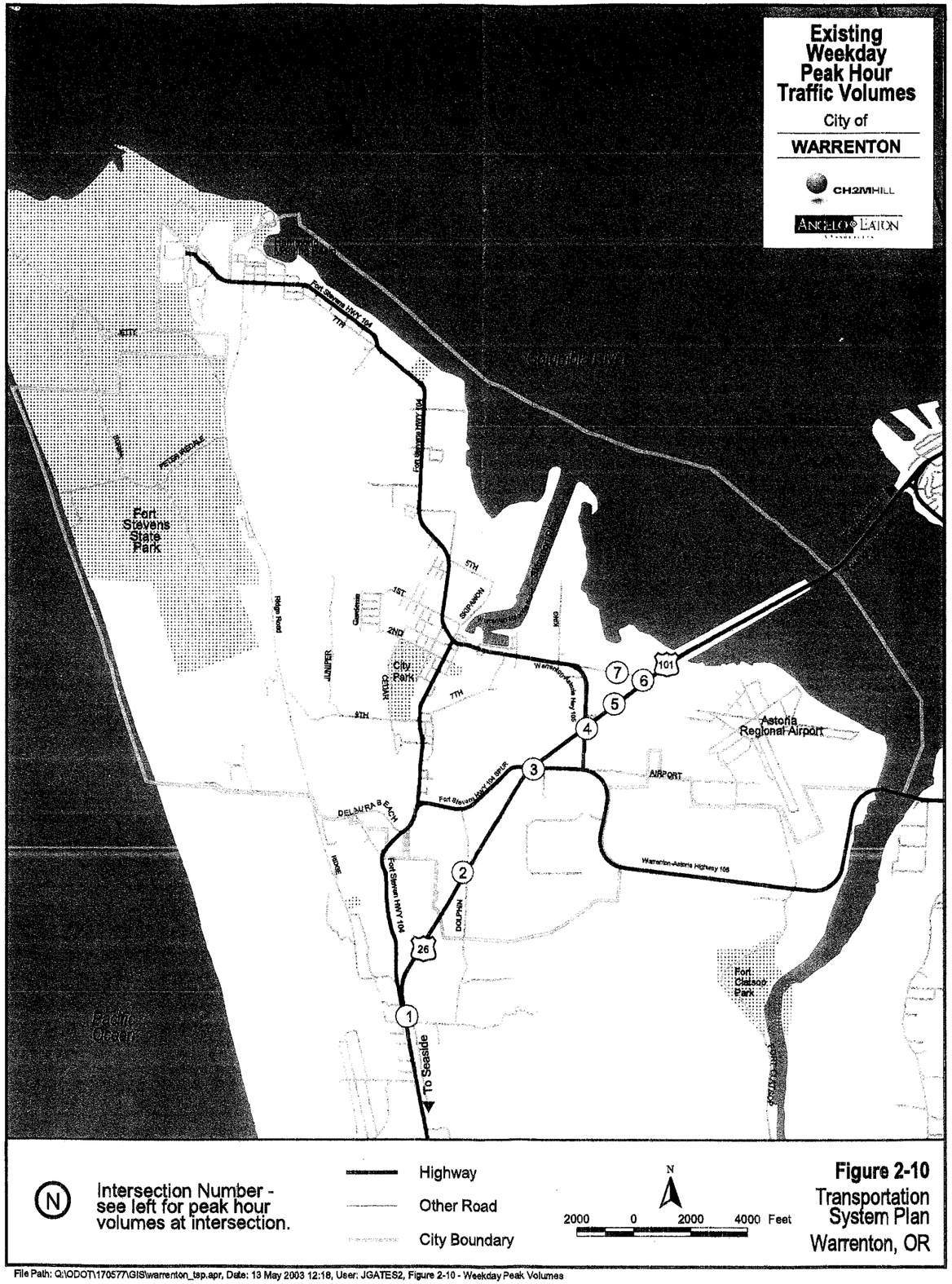


Figure 2-10
Transportation System Plan
Warrenton, OR

File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:18, User: JGATES2, Figure 2-10 - Weekday Peak Volumes

TABLE 2-4
LOS Control Delay Ranges

LOS	Unsignalized Intersections (control delay in seconds)	Signalized Intersections (control delay in seconds)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	>50	>80

Source: 2000 Highway Capacity Manual, Transportation Research Board.

Analysis Methodology

For the analysis of existing conditions at the 12 study intersections, Synchro, Version 5 was used. This methodology is based on the Highway Capacity Manual (HCM). An analysis of existing conditions was conducted using the 30th-highest-hour traffic volumes shown in Figure 2-8 to evaluate how the existing transportation performs during the peak tourist season. An analysis of existing conditions also was conducted under peak weekday hour conditions to evaluate how the system performs when there is less tourist traffic.

Traffic Operations at Intersections (30th-Highest-Hour Conditions)

Tables 2-5 through 2-7 present intersection LOS, OHP mobility standard, v/c ratio and delay time for each intersection analyzed. Tables 2-5 through 2-7 are organized by intersection type (signalized, all-way stop-controlled, and two-way stop-controlled). LOS is calculated based on intersection delay using the 2000 HCM. For each intersection, Tables 2-5 through 2-7 compare the OHP v/c mobility standard against 30th-highest-hour operating conditions. Bold, italic text is used to highlight operating conditions that currently exceed OHP mobility standards.

Table 2-5 summarizes the results of the operational analysis of existing conditions for the 30th-highest-hour for the two signalized intersections in Warrenton. Currently, the intersection of US 101 and East Harbor Drive exceeds OHP v/c mobility standards.

TABLE 2-5
Operational Analysis for Signalized Intersections—30th-Highest-Hour (Year 2002)

Intersection	LOS	OHP Mobility Standard	V/C Ratio	Delay (sec)
US 101 and East Harbor Drive	C	0.75	***0.86***	27.6
US 101 and Neptune Drive	B	0.75	0.67	18.2

Source: Synchro HCM Signalized Report.

Table 2-6 summarizes the results of the operational analysis of existing conditions for the 30th-highest-hour at the all-way, stop-controlled (AWSC) intersections in Warrenton. The v/c ratio reported represents the maximum (or worst) for any intersection movement. Currently, all of the AWSC intersections meet OHP standards.

TABLE 2-6
Operational Analysis of AWSC Intersections—30th-Highest-Hour (Year 2002)

Intersection	LOS	OHP Mobility Standard	V/C Ratio	Delay (Sec)
Fort Stevens Highway 104 and Warrenton-Astoria Highway 105	C	0.85	0.65	17.8
Critical Movement: Westbound (Warrenton-Astoria Highway 105)				
Fort Stevens Highway 104 and Lake Drive	A	0.85	0.29	9.2
Critical Movement: Westbound (Fort Stevens Highway 104)				

Source: Synchro HCM Unsignalized Report.

Table 2-7 summarizes the results of the operational analysis of existing conditions for the 30th-highest-hour at the two-way, stop-controlled (TWSC) intersections in Warrenton. Table 2-7 reports results for the movement with the worst operating performance. The minor approaches to a TWSC intersection may operate at LOS E or F because the minor movements are required to stop and wait for an acceptable gap in traffic along the major road. For minor approach movements with LOS E or F, safety or geometric improvements may improve operations. Traffic signal warrants also can be investigated to determine if a signal would improve the overall operating conditions of the network.

TABLE 2-7
Operational Analysis of TWSC Intersections—30th-Highest-Hour (Year 2002)

Intersection	LOS	OHP Mobility Standard	Max. V/C Ratio	Delay (Sec)
US 101 and Fort Stevens Highway 104 and Perkins Lane	E	0.80	0.75	47.2
Critical Movement: Eastbound (Fort Stevens Highway 104)				
US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105)	**F**	0.85	***1.26***	257.5
Critical Movement: Southbound (SE Marlin Avenue)				
US 101 and Fort Stevens Highway 104 Spur	B	0.85	0.14	12.8
Critical Movement: Eastbound Through (Fort Stevens Highway 104 Spur)				
US 101 and SE Dolphin Avenue	E	0.85	0.29	42.3
Critical Movement: Southbound (SE Dolphin Avenue)				
East Harbor Drive and SE Neptune Avenue	**F**	0.85	***1.17***	182.3
Critical Movement: Northbound Left (SE Neptune Avenue)				
Warrenton-Astoria Hwy 105 (SE Marlin Ave) and E. Harbor Drive	D	0.85	0.43	27.5
Critical Movement: Northbound (SE Marlin Avenue)				
Fort Stevens Highway 104 and Seventh Avenue (Hammond)	A	0.85	0.16	0.5
Critical Movement: Southbound (Fort Stevens Highway 104)				
Fort Stevens Highway 104 and DeLaura Beach Lane	B	0.85	0.17	11.0
Critical Movement: Southbound (DeLaura Beach Lane)				

Source: Synchro HCM Unsignalized Report.

Table 2-7 indicates that the TWSC intersections of US 101 and Marlin Drive (Warrenton-Astoria Highway 105) and Harbor Street and Neptune Drive have minor movements operating below mobility standards during 30th-highest-hour conditions.

Operational Analysis Results (30th-Highest-Hour)

As shown in Tables 2-5 though 2-7, 9 of the 12 intersections in the study area meet mobility standards designated in the OHP with 30th-highest-hour volumes under existing conditions. The following intersections do not meet mobility standards designated in the OHP:

- **US 101 and East Harbor Drive (Signalized).** Four movements at this intersection, including the eastbound left, southbound through, northbound left, and northbound through movements have v/c ratios greater than 0.75. All other movements have v/c ratios less than 0.75. Compared to other intersections in Warrenton, this intersection experiences the highest entering peak-hour volumes (see Table 2-2).
- **US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105).** All movements on US 101 have v/c ratios of less than 0.42. The southbound movements on Marlin Drive

have v/c ratios of 1.26 and the northbound movements on Marlin Drive have v/c ratios of 0.95, which are both deficient by OHP standards. Significant delay time occurs at the Marlin Drive approaches during 30th-highest-hour conditions for several reasons, including the traffic patterns on US 101 and the existing lane configuration on SE Marlin Avenue. Traffic turning from the SE Marlin Avenue approaches must wait for an appropriate gap in traffic along US 101 to continue through the intersection. Under the 30th-highest-hour conditions there is steady traffic on US 101 with short gaps between traffic, which causes large delay times for traffic on the SE Marlin Avenue approaches. The lane configuration of each approach on SE Marlin Avenue is a shared left/through/right lane. A vehicle turning left or traveling across the intersection would cause large delay times for vehicles turning right onto US 101 under steady traffic conditions.

- **East Harbor Drive and SE Neptune Avenue.** All movements on East Harbor Drive have v/c ratios of less than 0.25. The northbound left turn movement on SE Neptune Avenue has a v/c ratio of 1.17 and the northbound right turn movement on SE Neptune Avenue has a v/c ratio of 0.24. Under 30th-highest-hour conditions, there is steady traffic along East Harbor Drive. Vehicles turning left from SE Neptune Avenue to East Harbor Drive must wait for gaps in both directions of traffic along East Harbor Drive, causing large delay times for this movement.

Figure 2-11 displays intersections described above that do not meet mobility standards designated in the OHP under existing conditions with 30th-highest-hour volumes.

Traffic Operations at Intersections (Weekday, Peak-Hour Conditions)

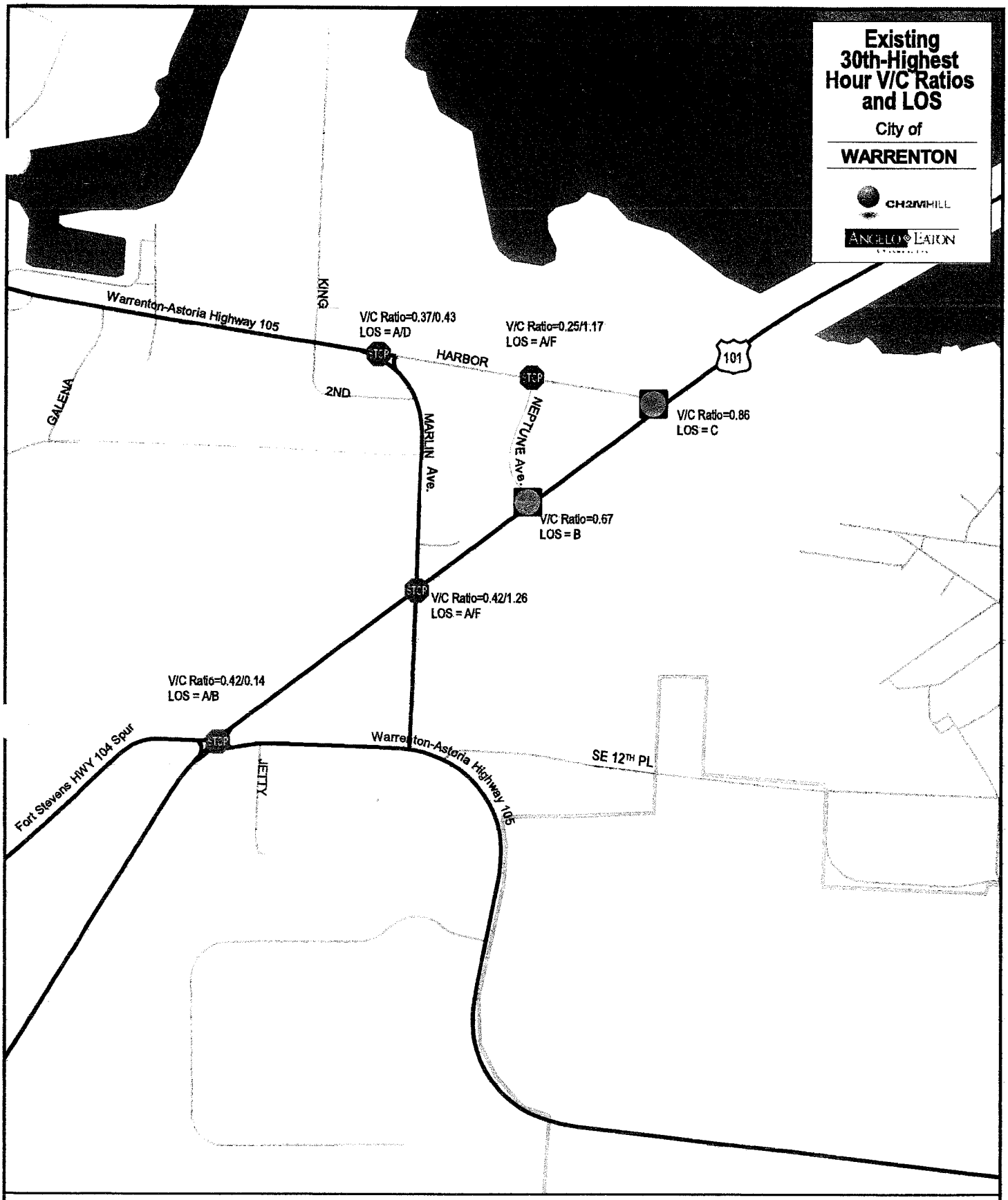
As seen with other tourist destinations along US 101, the 30th-highest-hour volumes in Warrenton occur during a weekend afternoon during the peak tourist season. To determine the operating conditions of intersections in the vicinity of US 101 outside of the peak tourist season (June through August), an analysis of existing conditions during the peak weekday hour was conducted at key intersections in Warrenton. The analysis includes intersections that did not meet mobility standards in the OHP with 30th-highest-hour volumes and surrounding intersections along US 101.

Tables 2-8 and 2-9 summarize the operational performance of each intersection analyzed under existing peak weekday hour conditions, including the intersection LOS, OHP mobility standard, v/c ratio, and delay time calculated using Synchro. Tables 2-8 and 2-9 are organized by intersection type and compare the OHP v/c mobility standard against weekday peak-hour operating conditions. Under these conditions, all of the intersections in Warrenton meet OHP mobility standards.

TABLE 2-8
Operational Analysis for Signalized Intersections—Weekday Peak Hour (Year 2002)

Intersection	LOS	OHP Mobility Standard	V/C Ratio	Delay (Sec)
US 101 and East Harbor Drive	B	0.75	0.64	17.4
US 101 and SE Neptune Avenue	B	0.75	0.50	16.1

Source: Synchro HCM Signalized Report.



File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:19, User: JGATES2, Figure 2-11 - 30th-Highest Hour V/C Ratios

TABLE 2-9
Operational Analysis of TWSC Intersections—Weekday Peak Hour (Year 2002)

Intersection	LOS	OHP Mobility Standard	Max. V/C Ratio	Delay (Sec)
US 101 and Fort Stevens Highway 104 and Perkins Lane	D	0.80	0.37	29.4
Critical Movement: Eastbound (Fort Stevens Highway 104)				
US 101 and SE Marlin Avenue (Warrenton-Astoria Hwy 105)	D	0.85	0.44	28.3
Critical Movement: Northbound (SE Marlin Avenue)				
US 101 and Fort Stevens Highway 104 Spur	B	0.85	0.27	26.9
Critical Movement: Eastbound (Fort Stevens Highway 104 Spur)				
US 101 and SE Dolphin Avenue	C	0.85	0.17	23.3
Critical Movement: Southbound (SE Dolphin Avenue)				
East Harbor Drive and SE Neptune Avenue	D	0.85	0.53	33.0
Critical Movement: Northbound Left (SE Neptune Avenue)				

Source: Synchro HCM Unsignalized Report.

Summary: Comparison of 30th-Highest-Hour and Weekday Peak-Hour Conditions

Under weekday, peak-hour conditions, the existing transportation system meets OHP mobility standards. As traffic volumes increase by 35 percent to 30th-highest-hour conditions because of traffic generated by weekend tourism on the Oregon Coast, 3 of the 12 intersections in Warrenton do not meet OHP mobility standards.

Safety Analysis

A safety analysis was conducted using data obtained from ODOT for intersections and roadway segments in Warrenton. The safety analysis included the top 10 accident sites in Warrenton, the 12 study intersections, the top 10 percent Safety Prioritization Index System (SPIS) sites, and State road segments. This section also includes discussion about the causes of accidents at intersections with geometric deficiencies. The safety analysis was conducted based on reported accidents to ODOT. This section provides a summary of the safety analysis. More detailed information about the analysis is available in the Background Document.

Top 10 Accident Sites and Study Intersections

A crash analysis was conducted using data obtained from ODOT for intersections in Warrenton. A list of the top 10 accident sites by the total number of crashes from January 1, 1997, to December 31, 2001, was obtained from ODOT for Warrenton and is summarized in Table 2-10 . Crash data was also obtained for the remaining intersections in the study area that do not appear on the top ten list (see Table 2-11).

TABLE 2-10
Crash Analysis of Top 10 Intersections (Year 1997 to 2001 Data)

No.	Location	Property Damage	Injuries	Fatalities	Crash Rate[1]
1	US 101 and SE Marlin Avenue (Warrenton-Astoria Hwy 105) — Top 10 percent SPIS Site	17	14	0	1.10
2	US 101 and East Harbor Drive	9	16	0	0.62
3	US 101 and Fort Stevens Highway 104	3	7	1	0.46
4	US 101 Within 100 feet of SE Neptune Avenue	4	5	0	0.31
5	Fort Stevens Highway 104 and NW 1st Street	3	3	0	N/A
6	Fort Stevens Highway 104 and Warrenton-Astoria Highway 105	4	2	0	0.25
7	Fort Stevens Highway 104 and SW 2nd Street	3	1	0	N/A
8	Warrenton-Astoria Highway 105 within 50 feet of NE Pacific Avenue	2	2	0	N/A
9	Warrenton-Astoria Highway 105 Within 100 feet of NE Heron Avenue	2	2	0	N/A
10	Warrenton-Astoria Highway 105 Within 100 feet of SE 12th Place	3	0	0	0.42

Source: ODOT Crash Data, Years 1997 to 2001.
[1]Crash rate in terms of million entering vehicle miles. N/A indicates ADT volumes not available.

TABLE 2-11
Crash Analysis of Remaining Intersections in Study Area (Year 1996 to 2000 Data)

Location	Property Damage	Injuries	Fatalities	Crash Rate[1]
US 101 and Fort Stevens Highway 104 and Perkins Lane	5	4	1	0.36
US 101 and SE Dolphin Avenue	0	0	0	0.00
East Harbor Drive and SE Neptune Avenue	0	0	0	0.00
Warrenton-Astoria Highway 105 (SE Marlin Avenue) and East Harbor Drive	1	2	0	0.13
Fort Stevens Highway 104 and Seventh Avenue (Hammond)	0	1	0	0.11
Fort Stevens Highway 104 and Lake Drive (Hammond)	1	0	0	0.17
Fort Stevens Highway 104 and DeLaura Beach Lane	0	0	0	0.00

Source: ODOT Crash Data, Years 1996 to 2000.
[1]Crash Rate in terms of million entering vehicles miles.

Crash rates were determined for each of the intersection locations and are summarized in Tables 2-10 and 2-11. An accident rate of greater than 1.0 crashes per million entering vehicles (MEV) generally indicates that accident causes should be further studied at an intersection. As shown in Tables 2-10 and 2-11, crash rates lower than 1.0 crashes per MEV were calculated at all but one intersection: US 101 at SE Marlin Avenue (Warrenton-Astoria

Highway 105). ODOT is addressing safety concerns at this intersection through a current Safety Priority Index System Project.

Safety Priority Index System (SPIS) Sites

The SPIS method is used by ODOT to identity locations with safety problems caused by the crash frequency, rate, and severity at the site. The top 10 percent ranked SPIS sites are evaluated each year by ODOT to identify improvements that may reduce the number and severity of accidents. The intersection of US 101 with SE Marlin Avenue (Warrenton-Astoria Highway 105) is the only year 2001 top 10 percent SPIS site in Warrenton. See Table 2-10 for the crash analysis at this intersection. In the 5-year period from 1997 to 2001, 31 total crashes were reported at this intersection. The intersection is unsignalized and operates as a TWSC intersection.

The intersection of US 101 with Fort Stevens Highway 104 and Perkins Lane was a top 25 percent SPIS site in year 2001, but was a top 10 percent SPIS site in years 2000, 1999, and 1998. Improvements to this intersection should be considered in the Clatsop County TSP, because this intersection is outside the Warrenton City limits.

Segment Crash Rates—State Facilities

As described in the 2000 State Highway Crash Rate Tables published by the Crash Analysis and Reporting Unit, Fort Stevens Highway 104, Fort Stevens Highway 104 Spur, and Warrenton-Astoria Highway 105 are non-freeway secondary highways and US 101 is a non-freeway primary highway. Table 2-12 summarizes the year 2000 crash rates and the 5-year average crash rates (1996 to 2000) along each of these roadways.

TABLE 2-12
Crash Rates Along State Highway Segments in Warrenton

Location	Year 2000 Crash Rate[1]	5-year Average Crash Rate[1]
US 101—Warrenton (Urban)	0.59	0.94
Fort Stevens Highway 104—Warrenton (Urban)	0.92	1.49
Fort Stevens Highway 104—Warrenton to US 101 (Rural)	0.58	0.63
Fort Stevens Highway 104 Spur (Rural)	0	0.28
Warrenton-Astoria Highway 105—Warrenton (Urban)	0.21	1.15

Source: 2000 State Highway Crash Rate Table, Crash Analysis and Reporting Unit, ODOT.
[1]Crash Rate in terms of million vehicles miles.

On urban sections only, the year 2000 statewide average crash rate was 2.90 crashes per million vehicle miles for non-freeway primary highways. With a crash rate of 0.59 crashes per million vehicle miles in Warrenton in year 2000, US 101 is below the state average crash rate for this type of roadway.

On rural sections only, the statewide average crash rate on non-freeway secondary highways was 1.14 crashes per million vehicle miles in year 2000. On urban sections only,

the statewide average crash rate on non-freeway secondary highways was 2.67 crashes per million vehicle miles in year 2000. As shown in Table 2-12, the crash rates in year 2000 along non-freeway secondary highways in Warrenton are below the statewide averages for both rural and urban sections. The average crash rates from years 1996 to 2000 are also below the statewide averages for both rural and urban sections.

Intersection Geometry and Safety Deficiencies

During a field visit to Warrenton, intersections with skewed geometry, potential safety issues, or sight distance issues were noted:

- US 101 and Fort Stevens Highway 104 Spur (sight distance/steep approaches)
- US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105) (skewed geometry)
- Fort Stevens Highway 104 and Seventh Avenue in Hammond (skewed geometry)
- DeLaura Beach Lane and Ridge Road (skewed geometry)
- US 101 and SE Dolphin Avenue (skewed geometry)

Although all of the identified intersections except for US 101 at SE Marlin Avenue (Warrenton-Astoria Highway 105) had relatively low crash rates under existing conditions, causes of accidents at each of these intersections was further evaluated. As traffic volumes increase at each intersection, geometric or safety deficiencies may create safety problems in the 20-year planning horizon.

The intersection of US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105) is the only year 2001 top 10 percent SPIS site in Warrenton. From 1996 to 2000, a majority of the 32 accidents occurred at the intersection (29) during daytime (25) with a dry surface (19). Of all the reported accidents, 11 involved a vehicle that stopped at US 101 and then continued moving across US 101 without right-of-way. Of these 11 accidents, 8 were angle collisions and 6 resulted in injuries. The skewed intersection geometry and operational performance of this intersection are most likely causes of this type of accident. Geometric improvements at this intersection are currently being designed through ODOT and are scheduled to be constructed in 2003.

The intersection of US 101 and Fort Stevens Highway 104 Spur appears on the top 10 accident site list for Warrenton. From 1996 to 2000, a majority of the 14 accidents occurred at the intersection (13) during daytime (12) with a dry surface (8). Of all the reported accidents, nine involved a vehicle that stopped at US 101 and then continued moving across US 101 without right-of-way. Of these nine accidents, all were angle collisions, five resulted in injuries, and one resulted in a fatality. The geometry and high approach volumes are most likely causes of this type of accidents. Geometric improvements at this intersection are currently being designed through ODOT and are scheduled to be constructed in 2003.

The intersections of Fort Stevens Highway 104 and Seventh Avenue in Hammond, DeLaura Beach Lane and Ridge Road, and US 101 and SE Dolphin Avenue do not appear on the top 10 accident list for Warrenton. However, the Warrenton Advisory Committee indicated that there was a fatality at the intersection of Ridge Road and DeLaura Beach outside of the 5-year period. The minor approaches for each of these intersections do not have significant delays under current operating conditions. Currently, the intersections of Fort Stevens Highway 104 with Seventh Avenue and DeLaura Beach Lane with Ridge Road serve low

ADT volumes in comparison to other intersections in Warrenton. The approaches of SE Dolphin Avenue at US 101 also serve low ADT volumes. If traffic volumes increase at these intersections, the safety and operational performance at these intersections would most likely get worse. Therefore, geometric improvements should be considered for these intersections as conditions change.

Public Transportation Inventory

In 2002, the following public transportation services in Warrenton were provided by SETD:

- Fixed-route service in Warrenton and between the five incorporated cities in Clatsop County
- Countywide Dial-A-Ride (DAR) service

Other public transportation services available in Warrenton include medical appointment transportation through the Northwest Ride Center, school bus service, fixed-route services available through Pacific Transit and Oregon Coachways, and door-to-door services provided by Bay Shuttle.

Fixed-Route Service—SETD

The following SETD routes served Warrenton in 2002. See the Background Document for further information.

- **Route 15**, *Astoria/Warrenton/Hammond*, provides service to the Cities of Astoria and Warrenton/Hammond. Route 15 has stops at 9th and Duane, the state offices, KFC, Fred Meyer (Warrenton), Warrenton Mini Mart, Kampers West, Point Adams, Corky's, KOA, Parkview Apartments, SW 9th St. and SW Cedar Ave., SW Alder Ave. and SW 2nd St., and Clatsop Community College. Route 15 operates during weekdays and on Saturday with 60-minute headways, starting at 6:25 a.m. and finishing at 8:00 p.m. According to the SETD Comprehensive Transportation Plan, this route carries 25 percent of SETD's riders.
- **Route 101**, *Astoria/Warrenton/Gearhart/Seaside*, provides service between the Cities of Astoria, Warrenton, Gearhart, and Seaside. Route 101 operates during weekdays and on Saturday between 6:00 a.m. and 8:20 p.m., with 120-minute headways. According to the SETD Comprehensive Transportation Plan, this route accounts for a fourth of the overall mileage served by SETD and carries more than a third of the system riders.

SETD routes will stop between the designated stops if flagged down by a rider. Along roads with more traffic, including US 101, riders are asked to call SETD so that buses can be alerted to pull off the road at a specified location. The headquarters for the SETD is located in Warrenton along Skipanon Drive.

Dial-A-Ride—SETD

DAR service currently is provided by SETD in Clatsop County. According to the SETD Comprehensive Transportation Plan, SETD operates five vehicles on weekdays between 6 a.m. and 4 p.m., which can be extended depending on demand. DAR service is available to

all users, but currently serves mainly seniors and disabled passengers. Riders are asked to call 2 days in advance to schedule a ride. However, SETD will schedule rides with less notice when possible. DAR headquarters are on NE Skipanon Drive.

Northwest Ride Center

The Northwest Ride Center (NWRC) provides transportation to medical appointments in Clatsop, Columbia, and Tillamook Counties for those passengers eligible under the Oregon Health Plan. The call center, which is stationed in Warrenton, is open Monday through Friday from 7:00 a.m. to 6:00 p.m.. Transportation services are scheduled through the call center and are provided 24 hours a day, 365 days per year, by reservation. Riders are asked to call at least 2 days in advance to schedule a ride. However, NWRC will schedule rides with less notice when possible.

School Bus

School bus service is provided in Warrenton by the Warrenton-Hammond School District. Four fixed-routes are operated each school day in addition to a route serving students with special needs. The bus headquarters for the school district is at Warrenton High School.

Pacific Transit

Fixed-route services are provided by Pacific Transit between Pacific County, Washington, and the City of Astoria. Four trips per day are currently provided into Astoria through this service. The stop in Astoria at 11th and Duane allows transfers with SETD Routes 101 and 15.

Oregon Coachways

Oregon Coachways provides fixed-route service between Portland and Astoria along US 26. The bus departs Astoria at 8:00 a.m. and arrives in Portland at 10:15 a.m. each day, making stops in Warrenton, Gearhart, Seaside, Cannon Beach, Necanicum Junction, Elsie, and Manning. The bus also departs Portland at 6:00 p.m. and arrives in Astoria at 8:15 p.m. each day. The stop at Fred Meyer allows transfers with SETD Routes 101 and 15.

Bay Shuttle

Bay Shuttle, which is based in southwest Washington, currently provides door-to-door service from northwest Oregon to the Portland area. The shuttle will pick up riders from their homes along US 101, US 26, or US 30 and transport them to Portland. Reservations up to a week in advance are required for use of this service.

Pedestrian System Inventory

Pedestrian facilities are an important component of the transportation system. As the *1995 Oregon Bicycle and Pedestrian Plan* (OBPP) explains, virtually everyone is a pedestrian at some point during the day. Pedestrians include children walking to and from school, people using wheelchairs or other forms of mobility assistance, people at bus stops, and people walking to and from their vehicles. Walking meets transportation needs for a significant segment of the population that does not have access to vehicle. Aside from providing a

necessary mode of transportation, a community's pedestrian system also offers recreational opportunities for both local and out-of-town users.

The Warrenton community has identified a comprehensive pedestrian and trail system as an important component of the City's character and high quality of life. The *2001 City of Warrenton Community Visioning Project*, which included three community meetings, demonstrated that the pedestrian and trail system is seen by residents as vital for connecting neighborhoods and community focal points, providing recreational opportunities, and maintaining the feel of an attractive and inviting community.

According to the OBPP, pedestrian facilities are walkways, traffic signals, crosswalks, and other amenities, such as illumination or benches. Warrenton has several different types of walkways, which are defined in the OBPP as "transportation facilities built for use by pedestrians and persons in wheelchairs," including the following:

- **Sidewalks:** Sidewalks are located along roadways, are separated from the roadway with a curb and/or planting strip, and have a hard, smooth surface, such as concrete. Examples of sidewalks in Warrenton include the sidewalks through downtown along South Main Avenue (Fort Stevens Highway 104).
- **Multi-use paths:** Multi-use paths can be used by a variety of people, including pedestrians, cyclists, skaters, and runners. Multi-use paths may be paved or unpaved, and are often wider than the average sidewalk (that is, 10 feet). Portions of the Warrenton Waterfront Trail are considered multi-use paths.
- **Roadway shoulders:** Roadway shoulders often serve as pedestrian routes in many Oregon communities. On roadways that experience low volumes of traffic, roadway shoulders are often adequate for pedestrian travel. These roadways should have shoulders wide enough so that both pedestrians and bicyclists can use them. Many local roadways in Warrenton are examples of roadway shoulder pedestrian facilities, including Fourth Avenue and King Salmon Street in the residential area south of the Hammond Mooring Basin.

The Warrenton pedestrian system can generally be characterized as comprehensive in certain areas of the City and lacking in other areas. There are some gaps in connectivity between neighborhoods with regard to pedestrian facilities. In general, the high number of private accesses and conflict opportunities are a barrier to continuous, connected pedestrian facilities in certain portions of Warrenton.

Existing Sidewalk Location

The existing sidewalks in Warrenton are generally concentrated in the downtown commercial core (Fort Stevens Highway 104) and in the established residential areas located directly to the west. Some sidewalks also exist in the newer residential areas to the west of Fort Stevens Highway 104 off SW 9th Street, and in the newer residential developments in the Hammond area near Fort Stevens State Park. Some streets, particularly newer development, have sidewalks on both sides, while others have sidewalks on just one side of the street. Many local streets do not have sidewalks, and pedestrians share the roadway with bicycle and vehicle traffic.

Existing Sidewalk Condition

Existing sidewalks in Warrenton are generally in good condition in many areas of the City. Most of the newer development west of Fort Stevens Highway 104 has 4- to 6-foot-wide, well-connected sidewalks with relatively smooth surfaces. Some areas of the City have intermittent sidewalks, where sidewalks exist in front of newer development, but do not connect with other sidewalks.

Existing Americans with Disabilities Act (ADA) Facilities

Most of the ADA ramps in Warrenton are located on sidewalks in the downtown core, near the commercial center at Neptune Drive, and in newer residential subdivisions directly west of the downtown area (SW 1st Street/Cedar/Alder/Birch/Gardenia area). Some of the ramps in the downtown core are not to ADA standard (for example, some are too steep or are cracked). Generally, ramps near the commercial center or the newer residential areas are compliant with ADA specifications, although there are some exceptions. The downtown area also features some texturized directional guidance for pedestrians with visual impairments (Fort Stevens Highway 104 and SW 2nd Street near the Warrenton Municipal Center building).

Existing Crosswalks

Table 2-13 lists the crosswalks in Warrenton. There are two signalized crosswalks in Warrenton, at US 101/East Harbor Drive and US 101/SE Neptune Avenue.

TABLE 2-13
Existing Crosswalks in Warrenton

Crosswalk Location	Crosswalk Type
SW Cedar Ave. / SW 7th Street (Elementary School)	Striped
SW Cedar Ave. (mid-block near Elementary School)	Striped
Fort Stevens Highway 104 / East Harbor Drive	Striped
Heceta Street / Pacific Drive (at Philadelphia Church School)	Striped
Heceta Street / Seventh Avenue (at Philadelphia Church School	Striped
Fort Stevens Highway 104 / SW 1st Street	Striped
Fort Stevens Highway 104 / SW 2nd Street	Striped
Fort Stevens Highway 104 / SW 3rd Street	Striped
Fort Stevens Highway 104 (at Warrenton High School)	Striped
US 101 / East Harbor Drive	Signalized
US 101 / SE Neptune Avenue	Signalized
Peter Iredale Road (various multi-use path crossings)	Striped
Burma Road (at registration site)	Striped

Existing Pedestrian Facilities at Pedestrian Generators

It is important for a city's pedestrian system to connect residential areas with commercial centers, schools, community focal points, and transit facilities, which are collectively referred to as pedestrian generators. The following descriptions characterize the pedestrian system near significant pedestrian generators in Warrenton.

- **Warrenton Elementary School.** Pedestrian facilities around Warrenton Elementary School are generally adequate. There are sidewalks along SW 9th Street from the school to Fort Stevens Highway 104, and along SW Cedar Avenue in front of the school (but not on the west side of the street). There is a striped crosswalk at SW Cedar Ave. and SW 7th Street, and a mid-block crosswalk to the school on SW Cedar Avenue. The crosswalks are not built to ADA standards. There is also signage for school crossings near the school. There are no sidewalks along SW 9th Street from SW Cedar Avenue to SW Juniper Avenue and beyond.

- **Warrenton High School.** Pedestrian facilities around Warrenton High School are not comprehensive, although this will improve after a sidewalk and bike lanes are constructed along Fort Stevens Highway 104 from US 101 (near the high school) north to SW 9th Street. This project is part of the Oregon Transportation Commission (OTC)-approved 2002-2005 Statewide Transportation Improvement Program (STIP). Currently, although there are warning signs and striped crosswalks for pedestrians near the school, but there are no sidewalks on Fort Stevens Highway 104 for student/employee use.

- **Downtown Warrenton (Fort Stevens Highway 104).** Downtown Warrenton is fairly well served in terms of pedestrian facilities. The main commercial core (Fort Stevens Highway 104 from East Harbor Drive to SW 2nd Street) is served by sidewalks on both sides of the street, and also has striped crosswalks at intersections. The sidewalk on the west side of the street (between 1st Street and 2nd Street) is at least 6 feet wide, and the sidewalk on the east side is narrower with some obstructions, such as flower boxes and electric light poles, that could be obstacles to people with wheelchairs. However, this area is mostly compliant with ADA standards, and also provides some pedestrian amenities, such as telephone booths and a bench. South of SW 2nd Street, the sidewalk is interrupted on both sides by private accesses.

  At the intersection of Fort Stevens Highway 104 and East Harbor Drive, there are sidewalks and ADA ramps on every corner of the intersection except the northeast corner. Crosswalks are striped on all four legs of the intersection.

- **Commercial Center at SE Neptune Avenue/US 101.** The commercial center near SE Neptune Avenue (Fred Meyer, Costco, etc.) has some pedestrian connections, but the system is not completely comprehensive. There are no sidewalks along SE Neptune Avenue from US 101 to East Harbor Drive or along East Harbor Drive near the commercial center. There are signalized crosswalks at the SE Neptune Avenue/US 101 and East Harbor Drive/US 101 intersections.

- **Warrenton Community Center/City Park.** The Warrenton Community Center and the City Park (tennis courts, ball fields, etc.) are located along SW Alder Avenue west of Fort Stevens Highway 104, adjacent to single-family and multi-family neighborhoods. Pedestrian facilities near the community center consist of a sidewalk on the west side of

SW Alder Avenue, as well as a path leading through residential development to the north of the community center building.

- **Soccer Fields on Ridge Road.** No pedestrian facilities serve the soccer fields on Ridge Road, which are located on both sides of Ridge Road to the north of the intersection with SW 9th Street. Although Ridge Road has fairly wide shoulders through this area, traffic generally moves too fast for pedestrian comfort. There are no crosswalks to provide access to the soccer fields from the west side of Ridge Road. SW 9th Street (intersection to the south of the soccer fields) also has striped shoulders.

- **Transit Stops/Multimodal Connections.** There are nine transit stops in Warrenton, served by SETD. None of these transit stops is signed or marked. Pedestrian facilities at the transit stops include:

  - **Fred Meyer**—ADA-compliant concrete landing pad; some surrounding sidewalks
  - **Mini-Mart**—Landing pad; some surrounding sidewalk
  - **Kampers West**—No pedestrian facilities/amenities
  - **Point Adams**—No pedestrian facilities/amenities
  - **Corky's**—Covered waiting area with bench
  - **KOA**—No pedestrian facilities/amenities
  - **Parkview Apartments**—No pedestrian facilities/amenities
  - **SW 9th Street/SW Cedar Ave.**—No pedestrian facilities/amenities
  - **SW 2nd Street/ SW Alder Ave. (near community center)**—Covered waiting area with bench

- **Beach Accesses.** Most beach accesses for pedestrians in the Warrenton urban limits are accessed via roadways. The major beach access roadways include Jetty Road and Peter Iredale Road in Fort Stevens State Park, and DeLaura Beach Lane just north of Camp Rilea (Oregon National Guard). Within Fort Stevens, there are five areas designated for beach access parking. DeLaura Beach Lane has wide shoulders on the north side from Fort Stevens Highway 104 to Ridge Road, but does not have sidewalks, west of Ridge Road (to SW Pine Drive and on to the beach) there are no sidewalks, and west of SW Pine Drive the roadway becomes gravel.

Existing Trail Locations and Conditions

The trail system in Warrenton consists primarily of the Warrenton Waterfront Trail and abandoned railway rights-of-way. The Warrenton Waterfront Trail is 4.5 miles long, and stretches from Seafarers' Park near the Hammond Mooring Basin and east along the Columbia River to E.H. Carruthers Park, and then on to Lighthouse Park near downtown Warrenton and finally to the SE 2nd Street Park/Kayak Dock. Much of this trail is located along old railway tracks/berms, some of it is located along flood control dikes, and some of it is located on existing roadway shoulders or sidewalks. Aside from those portions located on roadway shoulders or sidewalks, the majority of the trail is unpaved or grass surface. Restroom facilities are available at the Hammond Mooring Basin, Eben Carruthers Park, and Lighthouse Park. Trash receptacles are placed at various locations along the trail.

Other "unofficial" trails in Warrenton include trails along the abandoned Portland Western railroad bed, which stretches from downtown Warrenton south to the west and parallel to Fort Stevens Highway 104 to the southern limits of Warrenton.

Bicycle System Inventory

Bicycle travel offers commuters, children, and others a significant option for transportation. Cycling is also a valid transportation choice for people who do not own vehicles. Cycling is an important recreational option, especially in scenic portions of the country, such as Clatsop County. According to OBPP, bicycles are found in most households in America.

State, County, and local plans have identified bicycle facilities as an integral portion of the Warrenton transportation system. Warrenton's Comprehensive Plan outlines plans and policies related to increasing transportation options for both individuals and organizations to conserve energy and attain other objectives. The comprehensive plan also discusses the importance of a local bikeway system, particularly ensuring safe access to schools and other community focal points.

According to OBPP, there are several different types of bicycle facilities. Bikeways are design treatments located on roadways to accommodate bicycles, such as signage or striped shoulders. Multi-use paths are facilities separated from a roadway for use by cyclists, pedestrians, skaters, runners, or others. Multi-use paths are discussed in the review of existing conditions for the Warrenton pedestrian system. The following are types of bikeways:

- **Shared Roadway:** Shared roadways include roadways on which cyclists, motorists, and pedestrians share the same travel lane. Shared roadways are common on neighborhood streets and rural roads, such as NW 9th Street or Seventh Avenue. According to OBPP, two design treatments can enhance travel on a shared roadway:
  - **Wide Outside Lanes** (where shoulder bikeways or bike lanes are warranted, but limited due to physical constraints—wide enough so that a vehicle can comfortably pass a bicycle)
  - **Bicycle Boulevards** (a modification of the operation of a local street to function as a through street for bicycles while maintaining local access for vehicles, often via traffic control devices).
- **Shoulder Bikeway:** Paved roadways are striped shoulders wide enough for bicycle travel. According to OBPP, most rural bicycle travel on State highways occurs on shoulder bikeways. Sometimes shoulder bikeways are signed as a signal to motorists to expect bicycle travel along the roadway. An example of this type of bikeway in Warrenton is portions of Fort Stevens Highway 104.
- **Bike Lane:** Bike lanes are portions of the roadway designated specifically for bicycle travel via a 6-foot-wide striped lane, and are particularly appropriate on arterials and major collectors. Bike lanes are often signed. Examples of roadways with bike lanes in Warrenton include US 101 and Ridge Road.

The Warrenton bicycle system generally consists of either shared roadways (particularly on local roads) or shoulder bikeways. Certain roadways are marked with bicycle signage (for example, Ridge Road and US 101). The bicycle system lacks some connectivity in certain

areas of Warrenton, such as north-south and east-west routes through town, and routes are characterized by a relatively high number of vehicle access points, which can cause barriers or hazards for bicyclists.

Existing Bikeway Locations

The existing bikeways in Warrenton are generally located along major arterials or collectors, such as US 101 or Ridge Road. See Figure 2-10 for roadway segments that are signed as bike routes or have bike symbol striping. Most facilities are shoulder bikeways. Many local streets do not have bikeways, and cyclists share the roadway with pedestrian and vehicle traffic. Bikeways (and sidewalks) are planned for construction along Fort Stevens Highway 104 from US 101 (near the high school) north to SW 9th Street. This project is part of the OTC-approved 2002-2005 STIP.

Existing Bikeway Condition

Maintenance issues are relevant on some bikeways/roadway shoulders in Warrenton. Generally, the existing bicycle facilities are characterized by good pavement condition. As noted above, the number of vehicle access points, both at intersections and mid-block, can cause barriers and hazards for cyclists. Few bikeways in Warrenton are designated via signage.

Existing Bicycle Facilities at Major Community Focal Points

- **Warrenton Elementary School.** There are no designated bike lanes on SW 9th Street or SW Cedar Avenue near Warrenton Elementary School, though there are some striped crosswalks and school warning signs on Cedar. Avenue The school has bicycle parking available for up to 45 bicycles.

- **Warrenton High School.** Bicycle facilities around Warrenton High School are not comprehensive, though this will improve after sidewalks and bike lanes are constructed along Fort Stevens Highway 104 from US 101 (near the high school) north to SW 9th Street (STIP project W. Harbor Street—Oregon Coast Highway, Key #11081). Currently, Fort Stevens Highway 104 near the high school has striped shoulders approximately 4 feet wide that could be used for bicycle travel. There are warning signs for pedestrians near the school, and there are crosswalks in front of the school on Fort Stevens Highway 104 for student/employee use. The Warrenton High School has bicycle parking for 15 bicycles.

- **Downtown Warrenton (Fort Stevens Highway 104).** There are no striped bicycle facilities through the commercial core of Warrenton (Fort Stevens Highway 104 from East Harbor Drive to SW 2nd Street), though south of SW 2nd Street there are some intermittent striped shoulders. There is also no bicycle parking downtown. Near the Fort Stevens Highway 104/ SW 1st Street intersection there is a sign indicating that bicycles are not allowed on the sidewalks. As discussed in the Pedestrian System Inventory, the number of private mid-block accesses is potentially hazardous for bicyclists. The Fort Stevens Highway 104/East Harbor Drive intersection near Lighthouse Park does not have marked bicycle treatments.

Fort Stevens Highway 104, north of the Fort Stevens Highway 104 /East Harbor Drive intersection has signage indicating that bicycles will be on the roadway. The bridges along this stretch of roadway are adequate for both bicycle and pedestrian travel as a striped shoulder route.

- **Commercial Center at SE Neptune Avenue/US 101.** The commercial center near SE Neptune Avenue (Fred Meyer, Costco, etc.) has few bicycle connections. There are no bike lanes along SE Neptune Avenue from US 101 to East Harbor Drive. US 101 has bike lanes, and there are signalized crosswalks across US 101 leading to this area for northbound bicyclists on US 101. Shoulders along East Harbor Drive are generally 4 feet wide in this area, though the width varies along the street's length.

- **Warrenton Community Center/City Park.** The Warrenton Community Center and the City Park (tennis courts, ball fields, etc.) are located along SW Alder Avenue west of Fort Stevens Highway 104, adjacent to single-family housing and multi-family housing neighborhoods. Bicyclists share the road with vehicles in this area. The Warrenton Community Center has bicycle parking available for two bicycles, but no designated bicycle parking is available at the ball fields.

- **Soccer Fields on Ridge Road.** The soccer fields on Ridge Road are located on both sides of Ridge Road to the north of the intersection with SW 9th Street. Ridge Road has fairly wide shoulders in this area, which are marked as bikeway facilities. There are no pedestrian facilities along Ridge Road in this area, so pedestrians may be found using the bike lanes. There are no crosswalks accessing the soccer fields. SW 9th Street (intersection to the south of the soccer fields) also has striped shoulders for bicycle use. No designated bicycle parking areas are available at the soccer fields.

- **Beach Accesses.** The major beach access roadways include Jetty Road and Peter Iredale Road in Fort Stevens State Park, and DeLaura Beach Lane just north of Camp Rilea (Oregon National Guard). The bicycle system in Fort Stevens State Park generally does not have recognized bike lanes. DeLaura Beach Lane has wide shoulders that can be used by bicyclists on the north side from Fort Stevens Highway 104 to Ridge Road. West of Ridge (to SW Pine Drive and on to the beach), there are no bike lanes and west of Pine the roadway becomes gravel.

- **US 101.** US 101 is designated and signed as the Oregon Coast Bike Route, and generally has wide, well maintained striped shoulders that are adequate for bicycle use in the Warrenton area. Signalized intersections along US 101 are somewhat confusing because the bike lanes and shoulders become wider (near East Harbor Drive and SE Neptune Avenue), leading some motorists to believe that these are lanes for vehicles. The New Youngs Bay Bridge between Warrenton and Astoria has no shoulders except on the causeway portion where it has shoulders four feet wide

- **East-West Connections.** Several of the East-West connections through Warrenton have designated bicycle routes. Warrenton-Astoria Highway 105 is generally adequate, although it lacks bicycle treatments at the intersection with Fort Stevens Highway 104. Most of the east-west connections have many vehicle access points.

- **Ridge Road.** Ridge Road has wide shoulders on both sides that are marked as bikeways (pavement markings). Unlike many portions of Warrenton, there are relatively few access points along Ridge Road for potential conflicts.

Area Bicycle Shops and Organizations

There are no specialized bicycle shops in Warrenton. The following bicycle shops are located in Clatsop County: Bikes and Beyond (Astoria), Mike's Bike Shop (Cannon Beach), Hauer's Cyclery and Locksmith (Astoria), Prom Bike and Hobby Shop (Seaside).

The major bicycle and pedestrian advocacy organization in the Warrenton/Clatsop County area is Bicycle Friendly. Bicycle Friendly is a non-profit chapter of the national Bicycle Transportation Alliance that focuses on bicycle and pedestrian issues in the northern coastal area of Oregon. More information regarding Bicycle Friendly can be found at: http://www.bicyclefriendly.org.

Air System Inventory

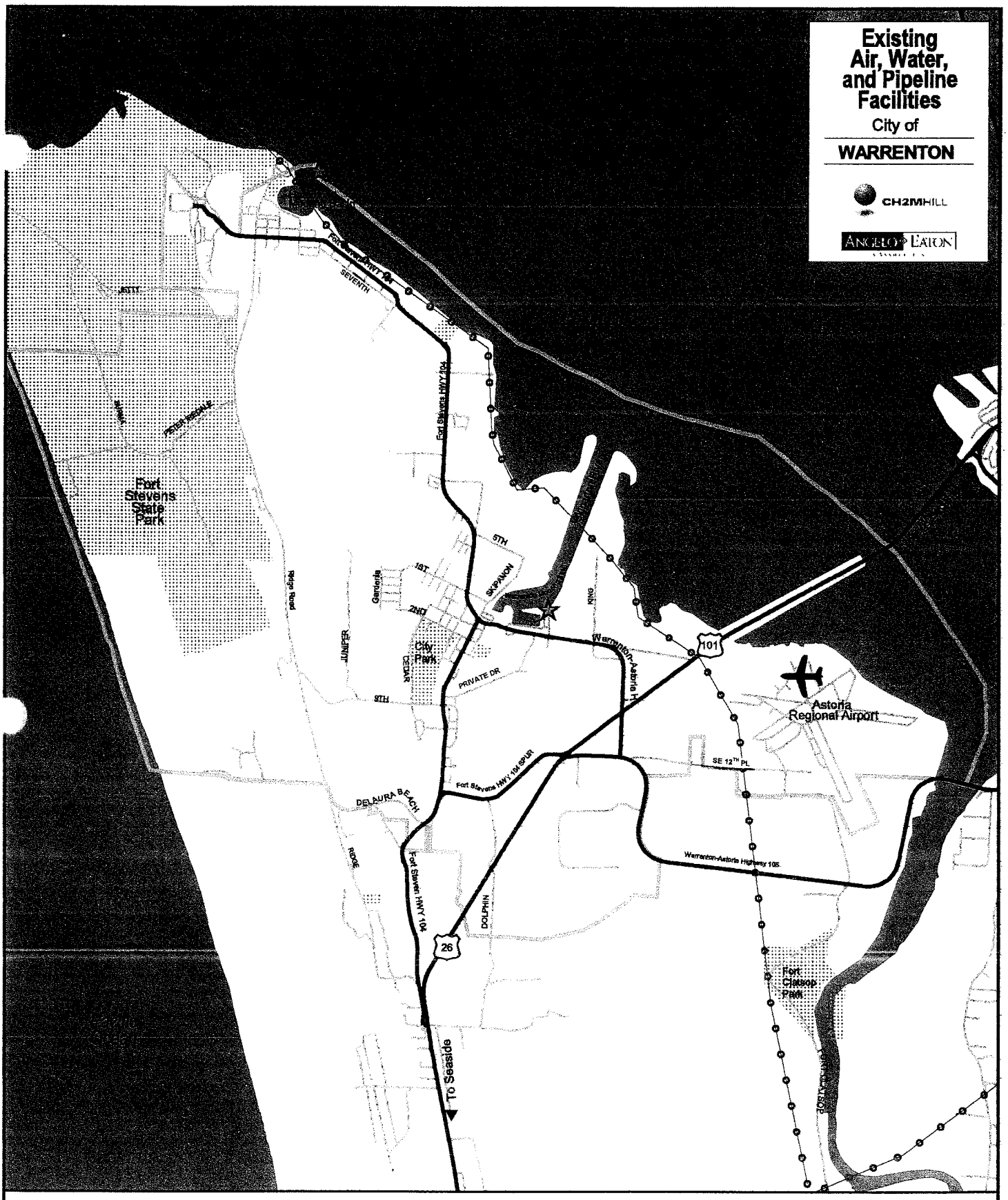
The Astoria Regional Airport, owned and operated by the Port of Astoria, is located in the City of Warrenton (see Figure 2-12). A U.S. Coast Guard Air Station is located at the airport and there are two active, asphalt-surfaced runways. In addition, the airport provides the following services: air freight, air cargo, charter flights, flight instruction, aircraft rental, hangars, and fuel. The airport averages 145 operations per day, with 47 aircraft based at the airport. Approximately 38 percent of the operations are military, 31 percent are local general aviation, 30 percent are transient general aviation, and 2 percent are air taxi. Currently the Astoria Regional Airport provides no commercial air passenger service. The Portland International Airport, which is located approximately 95 miles from Astoria, is the closest commercial air passenger service provider. SkyTaxi service, which provides the ability for passengers to make arrangements to fly from Astoria to hub airports or out-of-the-way destinations, is available at the Astoria Regional Airport. SkyTaxi flights serve Oregon, Washington, Idaho, NW. Utah, Nevada, W. Montana, N. California, and S. British Columbia.

As summarized in the Astoria Airport Master Plan prepared in 1993, the Astoria Regional Airport had sufficient capacity to handle existing demand (1993) and expected future demand for the 20-year planning period (2013). The Airport Manager for the Port of Astoria indicates that the Astoria Regional Airport still has sufficient capacity to handle existing demand (2002) under current use.

Access to the Astoria Regional Airport from the west is provided along Airport Road, which connects with Warrenton-Astoria Highway 105, Fort Stevens Highway 104 Spur, and US 101. From the east, access to the airport is provided along SE Flight Line Drive and SE 12th Place, which connect with Warrenton-Astoria Highway 105.

Rail System Inventory

There are currently no rail facilities in Warrenton. All historic railroad beds in Warrenton have been abandoned and many are presently used as trails. A railroad trestle that connected Warrenton to Astoria across Young's Bay was removed in the 1980s.



File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:20, User: JGATES2, Figure 2-12 - Existing Air, Water, and Pipeline

Water System Inventory

There are two existing moorage facilities in Warrenton, including the Warrenton Mooring Basin on the Skipanon River and the Hammond Mooring Basin on the Columbia River (see Figure 2-11). Both facilities provide services to recreational boats as well as commercial boats and guide services. Use of both facilities is seasonal, with maximum use occurring from May to November. Boats that are too large for the mooring basins in Warrenton are referred to the Port of Astoria.

Warrenton Mooring Basin

The Warrenton Mooring Basin can accommodate commercial boats up to 100 feet long and recreational boats up to 50 feet long. The facility has about 375 slips and inadequate parking facilities to handle parking demand during the summer months. The Warrenton Mooring Basin requires a fee for each launch. Access to the Warrenton Mooring Basin is provided along NE Ensign Avenue, East Harbor Drive, and NE Harbor Place.

Hammond Mooring Basin

The Hammond Mooring Basin can handle boats up to 50 feet long and has about 175 slips. The Columbia River Bar Pilots use the Hammond Mooring Basin facilities. Access to the Hammond Mooring Basin is provided along Lake Drive and Iredale Avenue.

Pipeline System Inventory

As shown in the Corridor Plans for US 26 and 30 and Figure 2-11, Warrenton is served by a Northwest Natural Gas pipeline that runs along the Columbia River from US 101 toward Hammond. There are no other significant pipelines in Warrenton.

Existing Conditions Summary

As described in this section, the major transportation corridor through Warrenton consists of US 101, which connects Warrenton with Astoria and Seaside. Under weekday PM peak-hour existing conditions, US 101 has sufficient capacity to serve local and low volumes of tourist traffic. As traffic volumes increase to 30th-highest-hour conditions because of high levels of tourism on the Oregon Coast, two intersections do not meet OHP mobility standards. Along US 101, several intersections with geometric or safety deficiencies were identified.

Several State, County, and City facilities also carry high traffic volumes because of tourism in Warrenton: Fort Stevens Highway 104, Fort Stevens Highway 104 Spur, Warrenton-Astoria Highway 105, Ridge Road, East Harbor Drive, and SE Neptune Avenue . Along each of these facilities, there are no deficiencies under existing weekday PM peak-hour conditions. Only one intersection (E. Harbor Dr. at SE Marlin Ave.) along each of these facilities does not meet OHP mobility standards under existing 30th-highest-hour conditions. Safety deficiencies that should be further evaluated were noted along several of these facilities.

Bicycle and pedestrian facilities are integral to the Warrenton transportation system, and should be improved where deficiencies have been identified. Shoulder widths should be increased to include bikeways on certain State, County and local facilities where warranted. Additionally, many local streets do not have sidewalks, and pedestrians share the roadway with bicycle and vehicle traffic. The lack of pedestrian facilities in these areas, as well as sidewalk maintenance issues and compliance with ADA need to be addressed.

The inventory of conditions on State, County, and City facilities will serve as a baseline for identifying the existing and future needs of the transportation system in Warrenton. In subsequent sections, projects and alternatives to address each identified need will be developed and evaluated.

SECTION 3

Future Transportation Conditions (2022) and Transportation System Needs

Population growth and increases in tourist volumes will play an important role in determining the future needs of the transportation system in Warrenton. This section summarizes the methodology used to determine future travel demand and the results of the operational analysis of future, forecasted (2022), no-build, 30th-highest-hour and weekday, peak-hour conditions in Warrenton. The no-build analysis of future, forecasted conditions in year 2022 assumes existing roadway geometry and traffic control, with the addition improvements and a signal at the intersection of US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105). This section also summarizes the needs of the transportation system as determined through the analysis of existing and future conditions. See the Background Document for more information on the methodology used in the analysis of future, forecasted, no-build conditions.

Population Growth

Within the next 20 years, population growth is expected in Warrenton and other incorporated communities of Clatsop County. The forcasted County population for 2020 is 41,788, which is 18 percent growth from the 2000 population of 33,301. Within the City of Warrenton, a 1.7 percent growth rate is expected between 2000 and 2020. Table 3-1 illustrates the historic and projected population for Warrenton, the incorporated areas, the unincorporated areas of the County, and the County as a whole. Within the City of Warrenton, future development will be driven by zoning and the locationss of wetlands.

TABLE 3-1
Clatsop County Population

	Actual[1]		Percent of County Population		New Forecasts		
Jurisdiction	1990	2000	1990	2000	2020 Urban Area Totals[2]	Percent of County Population[4]	Average Annual Growth Rate 2000-2020
Warrenton[3] Hammond	2,681	4,096	9.82 percent	11.50 percent	5,741	13.74 percent	1.70 percent
Incorporated Total	20,946	22,392	62.90 percent	62.85 percent	28,017	67.05 percent	1.13 percent
Unincorporated Total	12,944	13,238	38.87 percent	37.15 percent	13,771	32.95 percent	0.20 percent
County Total	33,301	35,630	-	-	41,788	-	0.80 percent

1. Center for Population Research and Census, Portland State University; United States Census.
2. City totals projected based on previous percentages of County population and percent growth.
3. Warrenton annexed Hammond in 1999, thus the substantial change in population.
4. Based on the previous growth rates and percentage of County population.
5. County projection from the Office of Economic Analysis, Department of Administrative Services, State of Oregon.

According to the 2000 US Census, the age of Warrenton's population is fairly well-distributed. Forty-two percent of the residents are between the ages of 25 to 55 years old, 35 percent are under the age of 25 years old and 23 percent are older than 55 years. Household income levels in Warrenton generally range from middle to low. Median household income for the 1,613 households is $33,472, while 68 percent are $49,999 or less. Eleven percent of the households earn less than $10,000 and 32 percent earn $50,000 or more.

The data on commuter patterns available from the 2000 US Census indicate that in Warrenton, an overwhelming majority of the 1,939 total workers over the age of 16 drive to work, either alone or as part of a carpool. Seventy-seven and one-half percent of workers drive to work alone, 11.3 percent drive in a carpool, 2.2 percent of workers take public transportation, 3.0 percent walk, 1.7 percent use another, unidentified mode, and 4.3 percent of the working population works at home. Though approximately 88 percent of the working population drives to work, 7.3 percent of the working population walks to work or works at home, highlighting the importance of pedestrian and bicycle systems. The mean travel time to work for Warrenton workers in 2000 was 21.3 minutes, slightly less than the 21.5 minute mean travel time for Clatsop County commuters as a whole.

Future Travel Demand

Several methodologies for determining future travel demand in Warrenton were considered, including use of the Astoria EMME/2 Model, the Oregon Statewide Model, and historical growth rates. Through discussions with ODOT's Transportation Planning and Analysis Unit (TPAU), historical growth rates calculated using the Future Volume Tables available on the ODOT Web site (http://www.odot.state.or.us/tddtpau/SysAnalysis.html) were used to determine future travel demand. This methodology is consistent with a Level 1 Trending Forecast as discussed in the ODOT TSP Guidelines. Table 3-2 presents the growth rates that were used to calculate future, forecasted, 2022 volumes for the 12 study intersections in Warrenton.

TABLE 3-2
Projected State Highway Growth Rates (1997-2019)

Highway Number	Annual Growth Rate
US 101	2.7 percent
Fort Stevens Highway 104	1.2 percent
Warrenton-Astoria Highway 105	2.0 percent

Source: ODOT Transportation Volume Tables.

The analysis of future, forecasted, no-build conditions assumes that the growth rates that have been observed in the past 20 years will continue through the 20-year planning horizon. If conditions change unexpectedly between existing conditions (2002) and the 20-year planning horizon (2022), the future, forecasted, traffic volumes will need to be revised.

The balanced year 2002 traffic volumes for the 12 intersections were projected to year 2022 volumes using the AAGR shown in Table 3-2.

Figure 3-1 presents balanced year 2022 peak-hour volumes at each intersection analyzed under no-build 30th-highest-peak-hour conditions.

Figure 3-2 presents balanced year 2022 peak-hour volumes at each intersection analyzed under no-build weekday peak-hour conditions. The 2022 weekday peak-hour volumes were calculated by applying the 1.35 seasonal adjustment factor to the balanced 30th-highest-hour year 2022 peak-hour volumes. Future, forecasted, weekday, peak-hour volumes were developed only for intersections in the vicinity of US 101, which is consistent with the analysis of existing conditions (2002).

Future, Forecasted, No-Build Conditions (2022)

For the analysis of future, forecasted, no-build conditions (2022) at the 12 study intersections, Synchro, Version 5 was used. This methodology is based on the HCM. For signalized intersections, results from the Synchro HCM Signalized Report are reported in this section. For unsignalized intersections, results from the Synchro HCM Unsignalized Report are reported in this section.

An analysis of future, forecasted, no-build conditions was conducted using the 30th-highest-hour traffic volumes shown in Figure 3-1 to evaluate how the existing transportation will perform during the peak tourist season compared with OHP mobility standards. An analysis of future, forecasted, no-build conditions also was conducted under forecasted PM peak-weekday-hour conditions to evaluate how the system will perform when there is less tourist traffic.

A signal has been proposed at the intersection of US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105). The addition of a signal at this intersection most likely will be included in a recently approved project that will add turn lanes to SE Marlin Avenue and reduce the skew of the intersection. The addition of a signal and turn lanes at the intersection of SE Marlin Avenue and US 101 is the only improvement that is included in the no-build analysis of future conditions (2022), because this project has committed funding through ODOT's STIP program.

Traffic Operations at Intersections (30th-Highest-Hour Conditions)

In addition to the three intersections previously identified as deficient under 30th-highest-hour existing conditions, this analysis predicts six additional intersections will fail to meet established OHP mobility standards with future, forecasted, 30th-highest-hour volumes under no-build conditions.

Tables 3-3, 3-4, and 3-5 present intersection LOS, OHP mobility standards, v/c ratio, and delay time for each intersection analyzed. Tables 3-3, 3-4, and 3-5 are organized by intersection type (signalized, AWSC, and TWSC). LOS is calculated based on intersection delay using the 2000 HCM. For each intersection, Tables 3-3, 3-4, and 3-5 compare the OHP v/c mobility standard against future, forecasted, no-build, 30th-highest-hour operating conditions. Bold, italic text is used to highlight operating conditions that will exceed OHP mobility standards in year 2022 under forecasted 30th-highest-hour conditions.

Table 3-3 summarizes the results of the operational analysis of future conditions for no-build 30th-highest-hour volumes at the two currently signalized intersections in Warrenton (US 101 at East Harbor Drive and US 101 at SE Neptune Avenue). With the existing geometric configuration of each intersection and the forecasted, future traffic volumes, both intersections will exceed OHP v/c mobility standards. Table 3-3 also includes results for the intersection of US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105), because this intersection most likely will become signalized in the near future. With the addition of left turn lanes and a signal, this intersection also will exceed OHP v/c mobility standards under future, forecasted, no-build conditions.

TABLE 3-3
No-Build Operational Analysis of Signalized Intersections—30th-Highest-Hour (Year 2022)

Intersection	LOS	OHP Mobility Standard (v/c ratio)	No-Build V/C Ratio	Delay (sec)
US 101 and East Harbor Drive	***F***	***0.75***	***1.33***	***143.2***
US 101 and SE Neptune Avenue	***D***	***0.75***	***1.04***	***43.6***
US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105)[1]	***E***	***0.75***	***1.05***	***72.5***

Source: Synchro HCM Signalized Report.

[1]A traffic signal will likely be constructed at this intersection in 2003.

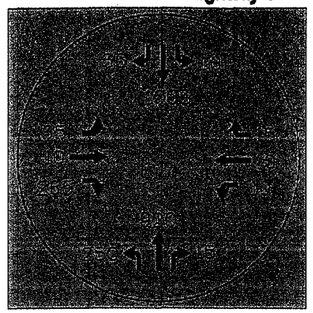
Table 3-4 summarizes the results of the no-build operational analysis of future, forecasted conditions for the 30th-highest hour at the AWSC intersections in Warrenton. The v/c ratio reported represents the maximum (or worst) for any intersection movement. With the existing geometric configuration of each intersection and future, forecasted, traffic volumes, the intersection of Fort Stevens Highway 104 and Warrenton-Astoria Highway 105 will exceed OHP v/c mobility standards. The intersection of Fort Stevens Highway 104 and Lake Drive will continue to meet OHP mobility standards.

TABLE 3-4
No-Build Operational Analysis of AWSC Intersections—30th-Highest-Hour (Year 2022)

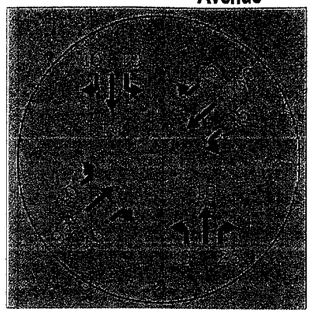
Intersection	LOS	OHP Mobility Standard (v/c ratio)	No-Build V/C Ratio	Delay (sec)
Fort Stevens Highway 104 and Warrenton-Astoria Highway 105	***C***	***0.85***	***0.89***	***23.4***
Critical Movement: Westbound (Warrenton-Astoria Highway 105)				
Fort Stevens Highway 104 and Lake Drive	B	0.85	0.39	10.6
Critical Movement: Westbound (Fort Stevens Highway 104)				

Source: Synchro HCM Unsignalized Report.

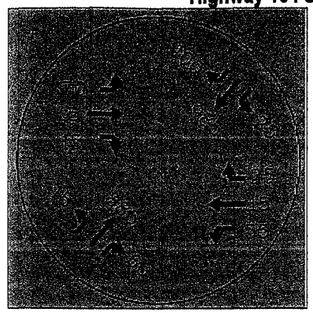
1 US 101 & Fort Stevens Highway 104



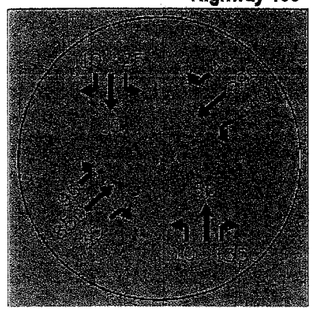
2 US 101 & Dolphin Avenue



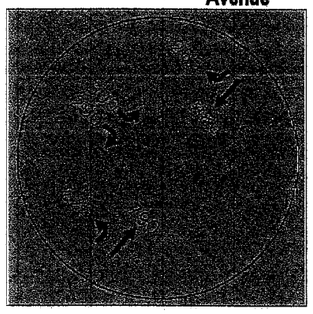
3 US 101 & Fort Stevens Highway 104 Spur



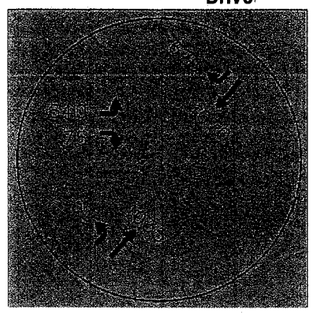
4 US 101 & Warrenton-Astoria Highway 105



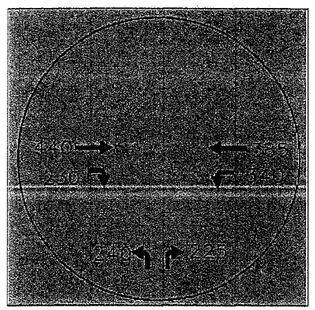
5 US 101 & Neptune Avenue



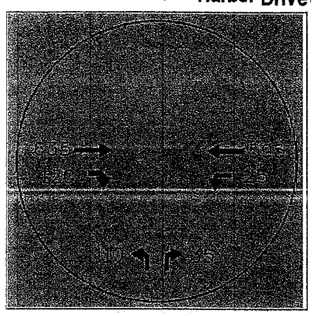
6 US 101 & Harbor Drive



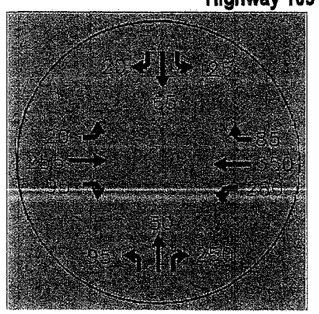
7 Harbor Drive & Neptune Avenue



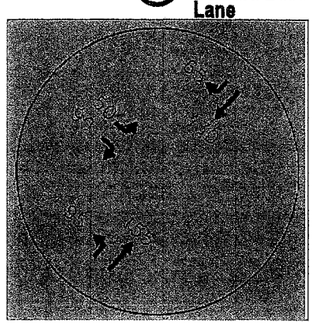
8 Warrenton-Astoria Highway 105 & Harbor Drive



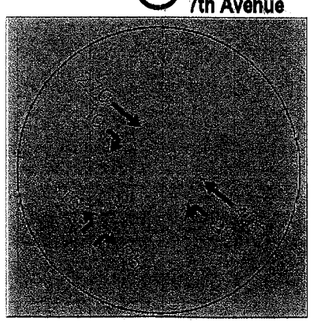
9 Fort Stevens Highway 104 & Warrenton-Astoria Highway 105



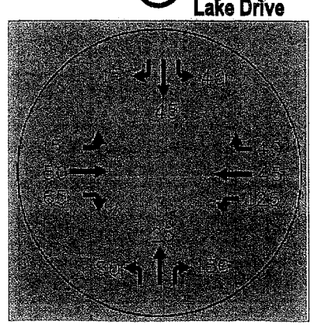
10 Fort Stevens Highway 104 & Delaura Beach Lane

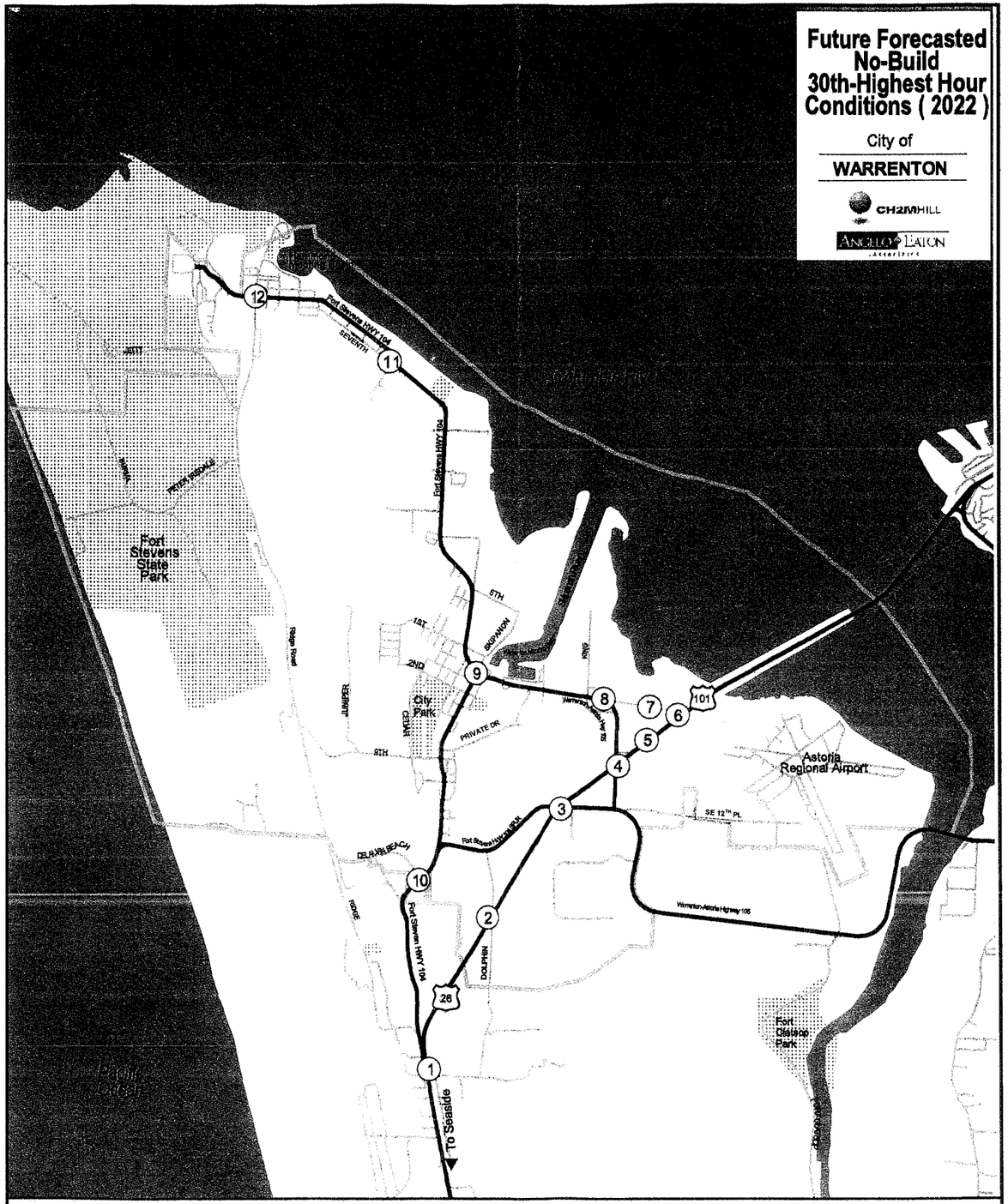


11 Fort Stevens Highway 104 & 7th Avenue



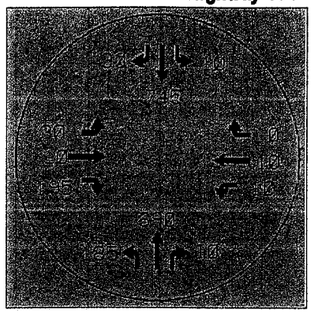
12 Fort Stevens Highway 104 & Lake Drive



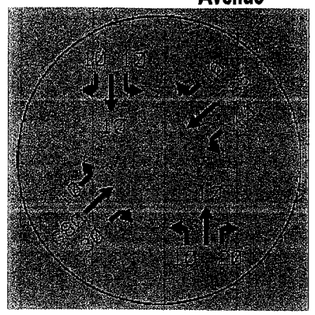


File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:23, User: JGATES2, Figure 3-1 - Forecasted No-Build

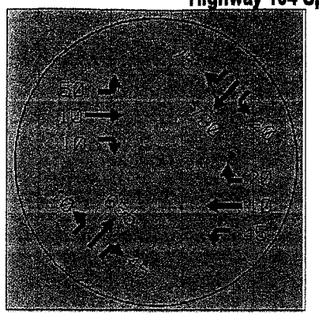
① US 101 & Fort Stevens Highway 104



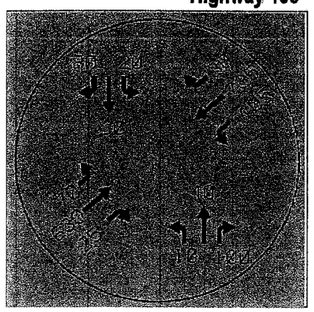
② US 101 & Dolphin Avenue



③ US 101 & Fort Stevens Highway 104 Spur



④ US 101 & Warrenton-Astoria Highway 105



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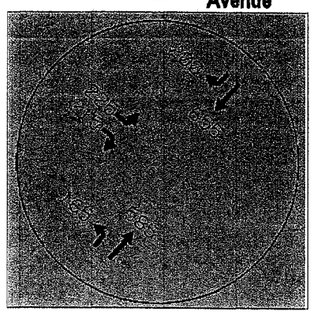
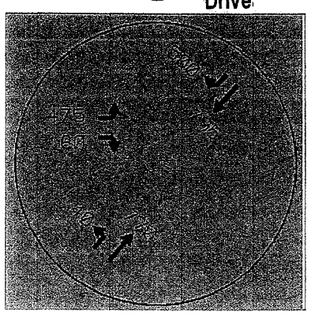
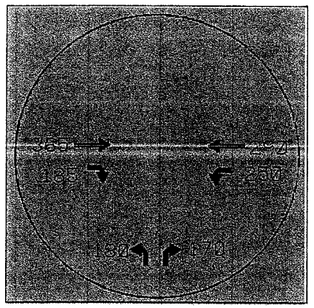
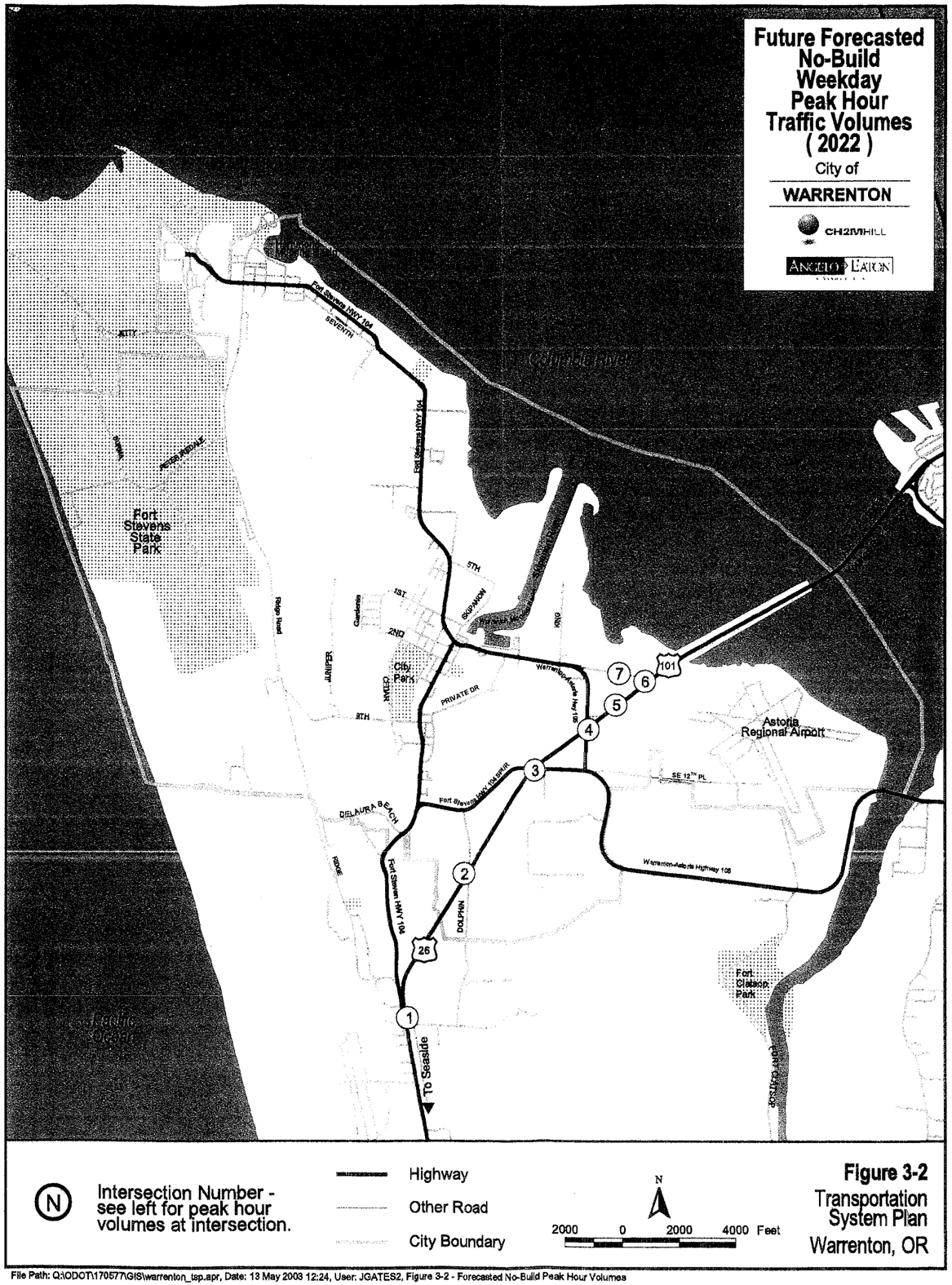


⑥ US 101 & Harbor Drive



⑦ Harbor Drive & Neptune Avenue





File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:24, User: JGATES2, Figure 3-2 - Forecasted No-Build Peak Hour Volumes

Table 3-5 summarizes the results of the no-build operational analysis of future conditions for the 30th-highest-hour at TWSC intersections in Warrenton. Table 3-6 shows results for the movement with the worst operating performance. As shown in Table 3-5 the minor approaches at five of the TWSC intersections in Warrenton would operate at a LOS of F under no-build future, forecasted, 30th-highest-hour conditions in year 2022. This occurs because the minor movements are required to stop and wait for an acceptable gap in traffic along the major road, causing high delay times for the minor movements. During the next phase of the TSP process, alternatives will be developed and analyzed to improve the operating conditions at each of these intersections.

TABLE 3-5
No-Build Operational Analysis of TWSC Intersections—30th-Highest-Hour (Year 2022)

Intersection	LOS	OHP Mobility Standard (v/c ratio)	No-Build Max. V/C Ratio	Delay (sec)
US 101 and Fort Stevens Highway 104 and Perkins Lane	F	0.80	ERR[1]	ERR[1]
Critical Movement: Eastbound (Fort Stevens Highway 104)				
E. Harbor Dr. and SE Marlin Ave. (Warrenton-Astoria Hwy 105)	F	0.85	1.21	205.9
Critical Movement: Northbound (SE Marlin Avenue)				
US 101 and Fort Stevens Highway 104 Spur	F	0.85	ERR[1]	ERR[1]
Critical Movement: Eastbound (Fort Stevens Highway 104 Spur)				
US 101 and SE Dolphin Avenue	F	0.85	ERR[1]	ERR[1]
Critical Movement: Southbound (SE Dolphin Avenue)				
East Harbor Drive and SE Neptune Avenue	F	0.85	ERR[1]	ERR[1]
Critical Movement: Northbound Left (SE Neptune Avenue)				
Fort Stevens Highway 104 and Seventh Avenue (Hammond)	A	0.85	0.20	0.6
Critical Movement: Southbound (Fort Stevens Highway 104)				
Fort Stevens Highway 104 and DeLaura Beach Lane	B	0.85	0.24	12.3
Critical Movement: Southbound (DeLaura Beach Lane)				

Source: Synchro HCM Unsignalized Report.
[1]ERR indicates an error message produced by Synchro because of high delay times on the minor movements.

Table 3-5 indicates that five of the seven study intersections that currently operate as TWSC intersections would not meet OHP mobility standards in year 2022 under no-build 30th-highest-hour conditions. At each of these five intersections, the minor movements would not meet OHP mobility standards. The major movements at each of the TWSC intersections would continue to meet OHP mobility standards in year 2022. If a signal is not constructed at the intersection of US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105), this intersection also would fail to meet OHP mobility standards in year 2022 as a TWSC intersection under no-build conditions.

As shown in Tables 3-3 though 3-5, 9 of the 12 intersections in the study area would not meet mobility standards designated in the OHP with forecasted year 2022 30th-highest-hourly volumes under no-build conditions.

Traffic Operations at Intersections (Weekday, Peak-Hour Conditions)

To determine the future operating conditions of intersections in the vicinity of US 101 outside of the peak tourist season (June through August) under no-build conditions, an analysis of future conditions using peak weekday hour volumes was conducted at key intersections in Warrenton. The future, no-build analysis includes all intersections that were analyzed under existing peak weekday traffic conditions.

Tables 3-3, 3-4, and 3-5 summarize the operational performance of each intersection analyzed, including the intersection LOS, OHP mobility standards, v/c ratio, and delay time calculated using Synchro. Tables 3-3, 3-4, and 3-5 are organized by intersection type and compare the OHP v/c mobility standard against future, no-build, weekday, peak-hour operating conditions. Under future, forecasted, no-build, weekday peak-hour operating conditions, six of the seven intersections listed in Tables 3-6 and 3-7 will fail meet OHP mobility standards.

TABLE 3-6
No-Build Analysis of Signalized Intersections—Weekday Peak-Hour (Year 2022)

Intersection	LOS	OHP Mobility Standard (v/c ratio)	V/C Ratio	Delay (sec)
US 101 and East Harbor Drive	D	0.75	0.99	42.7
US 101 and SE Marlin Ave. (Warrenton-Astoria Hwy 105)	C	0.75	0.80	26.0
US 101 and SE Neptune Avenue	C	0.75	0.77	22.6

Source: Synchro HCM Signalized Report.

Table 3-7 reports results for the movement with the worst operating performance on both the major and minor approaches at each intersection (major/minor).

TABLE 3-7
No-Build Analysis of TWSC Intersections—Weekday Peak-Hour (Year 2022)

Intersection	LOS	OHP Mobility Standard	Max. V/C Ratio	Delay (sec)
US 101 and Fort Stevens Highway 104 and Perkins Lane	F	0.80	2.16	733.9
Critical Movement: Eastbound (Fort Stevens Highway 104)				
US 101 and Fort Stevens Highway 104 Spur	F	0.85	1.02	175.9
Critical Movement: Westbound (Fort Stevens Highway 104 Spur)				
US 101 and SE Dolphin Avenue	F	0.85	0.90	154.9
Critical Movement: Southbound (SE Dolphin Avenue)				
East Harbor Drive and SE Neptune Avenue	F	0.85	1.75	433.3
Critical Movement: Northbound left (SE Neptune Avenue)				

Source: Synchro HCM Unsignalized Report.

Comparison of No-Build Year 2022 30th-Highest-Hour Analysis and Weekday Peak-Hour Analysis

Under future, forecasted, no-build, weekday, peak-hour conditions, all of the seven intersections listed above will not meet OHP mobility standards. As traffic volumes increase by 35 percent to the 30th-highest-hour future, forecasted, no-build volumes because of traffic generated by weekend tourism on the Oregon Coast, conditions will worsen at each intersection and all seven intersections will fail to meet OHP mobility standards.

In addition to the seven intersections near US 101 that were analyzed under both 30th highest hour and weekday peak hour future forecasted conditions, five local intersections within Warrenton were analyzed under future forecasted 30th highest hour conditions only. The intersections of East Harbor Drive at SE Marlin Avenue (Warrenton-Astoria Highway 105) and Fort Stevens Highway 104 at Warrenton-Astoria Highway 105 will fail to meet OHP mobility standards under no-build, future forecasted 30th highest hour conditions. The intersections of Fort Stevens Highway 104 with Lake Drive, Seventh Avenue, and DeLaura Beach Lane will continue to meet OHP mobility standards under future forecasted no-build 30th highest hour conditions.

Sensitivity Analysis—Growth Rates

A sensitivity analysis was conducted to determine the maximum average annual growth rate that would be supported by the existing geometry at each intersection below to meet OHP mobility standards under 30th-highest-hour conditions in year 2022. The analysis was conducted for all no-build intersections projected not to meet OHP mobility standards using the trend forecast growth rates in Table 3-8. The intersections of US 101 with East Harbor Drive and E. Harbor Dr. with SE Neptune Avenue were excluded from the analysis because these intersections do not meet OHP mobility standards under existing 30th-highest-hour conditions (2002). The intersection of US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105) was included in the analysis as a signalized intersection. Table 3-8 summarizes the growth factor (GF) and resulting AAGR for each intersection that would meet OHP mobility standards. The maximum growth factors were determined using Synchro through an iterative process, where existing traffic volumes were adjusted until the v/c ratio equaled the OHP mobility standard. The growth factors represent the maximum increase in existing traffic volumes that will equal OHP mobility standards in year 2022.

TABLE 3-8
Maximum Growth Rate To Meet OHP Mobility Standard—No-Build Alternative (Year 2022)

Intersection	Maximum Growth Factor	Maximum Sensitivity Analysis AAGR	Mobility Standard (v/c ratio)
US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105) (Signalized)	1.19	0.95 percent	0.75
US 101 and SE Neptune Avenue (Signalized)	1.12	0.6 percent	0.75
Fort Stevens Highway 104 and Warrenton-Astoria Highway 105 (AWSC)	1.32	1.6 percent	0.85
US 101 and Fort Stevens Highway 104 and Perkins Lane (TWSC)	1.03	0.2 percent	0.85 (Eastbound)
East Harbor Drive and SE Marlin Avenue (Warrenton-Astoria Highway 105) (TWSC)	1.30	1.5 percent	0.85 (Northbound)
US 101 and Fort Stevens Highway 104 Spur (TWSC)	1.29	1.5 percent	0.85 (Eastbound)
US 101 and SE Dolphin Avenue (TWSC)	1.31	1.6 percent	0.85 (Southbound)

Source: Synchro HCM Signalized and Unsignalized Reports.

As shown in Table 3-8, annual growth rates of less than 1 percent would be required for three of the seven intersections to meet OHP mobility standards in year 2022. Annual growth rates of less than 1 percent per year are unrealistic based on historical growth rates.

At four of the seven intersections, growth rates of less than 1.5 percent or 1.6 percent would be required to meet OHP mobility standards in year 2022. At the intersection of East Harbor Drive and SE Marlin Avenue (Warrenton-Astoria Highway 105), the maximum growth rate of 1.5 percent is in the same range of the historical growth rate seen on Warrenton-Astoria Highway 105. At the intersection of Fort Stevens Highway 104 and Warrenton-Astoria Highway 105, the maximum growth rate of 1.6 percent is similar to the historical growth rate of Warrenton-Astoria Highway 105. At the intersections of US 101 with Fort Stevens Highway 104 Spur and SE Dolphin Avenue, the maximum growth rates of 1.5 percent and 1.6 percent are unrealistic based on historical growth rates on US 101.

Preliminary No-Build Year 2022 Traffic Signal Warrant Analysis

A preliminary traffic signal warrant analysis was conducted for each of the AWSC and TWSC intersections included in the no-build analysis of future conditions (2022) to determine the need for future signalization under no-build conditions. The preliminary traffic signal warrant analysis is based on Warrant 1 (Eight-Hour Vehicular Volume) from the Manual on Uniform Traffic Control Devices (MUTCD). The analysis was based on forecasted year 2022 30th-highest-hour ADT volumes, as directed by ODOT's TPAU.

Condition A of the warrant analysis is based on minimum traffic volumes and is designed to warrant the installation of traffic signals at intersections where there are large volumes of intersecting traffic. Condition B of the warrant analysis is based on interruption of continuous traffic and is designed to warrant the installation of a traffic signal at intersections where heavy major movements restrict minor turn movements. A location

must meet one of these conditions to warrant the installation of a traffic signal. The MUTCD Millennium Edition provides more discussion on specifics of the warrant analysis.

As described in the MUTCD, the preliminary traffic signal warrant analysis was conducted for the 70 percent columns included in the warrant analysis description. The 70 percent column is applicable to projects in isolated communities with populations of less than 10,000 or where the 85th percentile speed is more than 40 mph. Using the forecasted population growth rate for Clatsop County on the Portland State University Population Research Center Web site, Warrenton would have a population of less than10,000 in year 2022. The MUTCD Millennium Edition provides more discussion on specifics of the warrant analysis.

The preliminary traffic signal warrant analysis did not include US 101 and Marlin Drive (Warrenton-Astoria Highway 105), because a traffic signal most likely will be constructed at this intersection in the near future. As shown in Table 3-9, the analysis found that four of the nine unsignalized intersections likely will meet signal warrants in year 2022 under no-build conditions.

TABLE 3-9
Results of Preliminary Traffic Signal Warrant Analysis (2022)—No-Build Conditions

Intersection	Meets Preliminary Warrant Analysis (70 percent)
Fort Stevens Highway 104 and Seventh Avenue (Hammond)	N
Fort Stevens Highway 104 and Lake Drive	N
Fort Stevens Highway 104 and DeLaura Beach Lane	N
East Harbor Drive and SE Neptune Avenue	Y
Fort Stevens Highway 104 and Warrenton-Astoria Highway 105	Y
US 101 and Fort Stevens Highway 104 and Perkins Lane	Y
US 101 and SE Dolphin Avenue	N
US 101 and Fort Stevens Highway 104 Spur	N
Warrenton-Astoria Hwy 105 (SE Marlin Ave.) and E. Harbor Dr.	Y

Traffic signals may not be installed in all locations meeting the preliminary signal warrant.

Conclusions

Under existing 30th-highest-hour operating conditions (2002), 3 of the 12 intersections in the study area do not meet OHP mobility standards in Warrenton. Under existing peak weekday operating conditions (2002), all of the 12 intersections in the study area meet OHP mobility standards in Warrenton.

Assuming continuation of historical growth trends during the next 20 years, operating conditions will become significantly worse in Warrenton. As presented in this TSP report, 9 of the 12 intersections will not meet OHP mobility standards under forecasted, 30th-highest-hour, no-build conditions in year 2022. Under no-build peak weekday conditions (2022), all

of the seven analyzed intersections will not meet OHP mobility standards. Of the nine unsignalized intersections in Warrenton, four most likely will meet traffic signal warrants in year 2022 under 30th-highest-hour no-build conditions.

Alternatives will be evaluated in Section 4 of this TSP to improve operating conditions in year 2022 in Warrenton. Alternatives will be developed based on goals and objectives, including preservation of the State highway system by minimizing the need for future signalization.

Transportation System Needs

This section describes the long- and short-term needs of the transportation system in Warrenton. Roadway, pedestrian and bicycle, transit, rail, air, and water needs were identified based on the analyses of existing and future forecasted, no-build conditions, and projects that have been recommended in relevant planning documents and policies. The needs included in this section have not been prioritized. In Section 4 of the Warrenton TSP, projects and alternatives will be developed to address the needs described in this section.

Roadway System Needs

Through the analysis of existing and future, forecasted 2022, no-build conditions; capacity; safety; and other roadway deficiencies were identified for State, County, and City facilities in Warrenton.

Operational Deficiencies—30th-Highest-Hour Conditions

Under future, forecasted, no-build, 30th-highest-hour conditions, operations at 9 of the 12 study intersections in Warrenton will not meet OHP mobility standards:

- US 101 and East Harbor Drive (Signalized)
- US 101 and SE Neptune Avenue (Signalized)
- US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105) (Signalized Intersection Assumed in No-Build Analysis)
- Fort Stevens Highway 104 and Warrenton-Astoria Highway 105
- US 101 and Fort Stevens Highway 104 and Perkins Lane
- East Harbor Drive and SE Marlin Avenue (Warrenton-Astoria Highway 105)
- US 101 and Fort Stevens Highway 104 Spur
- US 101 and SE Dolphin Avenue
- East Harbor Drive and SE Neptune Avenue

Operational deficiencies that are forecasted under 2022, no-build, 30th-highest-hour conditions are significant, because all of the intersections analyzed along US 101 will not meet OHP mobility standards. Intersections along East Harbor Drive also will be deficient under future, forecasted, 30th-highest-hour conditions.

Operational Deficiencies—Weekday Peak-Hour Conditions

Peak traffic volumes in Warrenton occur on holidays and during the summer tourist season. Weekday peak-hour volumes were developed for both existing and future, forecasted, no-build conditions to determine the operational performance of the transportation system in Warrenton outside of the summer months. Seven intersections in close proximity to US 101 were included in the analysis of weekday peak-hour conditions.

In year 2022, under no-build, weekday peak-hour, forecasted conditions, all of the seven study intersections will not meet OHP mobility standards:

- US 101 and East Harbor Drive (Signalized)
- US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105) (Signalized Intersection Assumed in No-Build Analysis)
- US 101 and SE Neptune Avenue (Signalized)
- US 101 and Fort Stevens Highway 104 and Perkins Lane
- US 101 and SE Dolphin Avenue
- East Harbor Dive and SE Neptune Avenue
- US 101 and Fort Stevens Highway 104 Spur

This analysis shows that five of the six intersections along US 101 in Warrenton will not meet OHP mobility standards under future, forecasted, no-build, weekday peak-hour conditions. The intersection of East Harbor Drive and SE Neptune Avenue currently does not meet OHP mobility standards under existing 30th-highest-hour conditions and will not meet mobility standards under future, forecasted, no-build, weekday, peak-hour conditions. All of the other intersections along East Harbor Drive and Warrenton-Astoria Highway 105 that were found to be deficient under future, forecasted, 30th-highest-hour conditions will not be deficient under future, forecasted, weekday, peak-hour conditions.

Safety Deficiencies

Through the analysis of existing conditions, comments from the PMT, AC, and public open house; and recommendations in relevant planning documents, several safety-related issues were identified. Improvements to the following intersections with geometric, sight distance, or safety issues are recommended:

- US 101 at SE Marlin Avenue (Warrenton-Astoria Highway 105) (top 10 percent SPIS site)
- US 101 at Fort Stevens Highway 104 Spur (sight distance)
- Fort Stevens Highway 104 and Seventh Avenue (skewed intersection)
- DeLaura Beach Lane and Ridge Road (skewed intersection)
- US 101 and SE Dolphin Avenue (geometry issues)
- Warrenton-Astoria Highway 105 and Fort Stevens Highway 104 (trucks)
- Fort Stevens Highway 104 and NE 5th Street (geometry issues)
- US 101 and Fort Stevens Highway 104 (top 10/25 percent SPIS site)
- Warrenton-Astoria Highway 105 and SE 12th Place (airport–skewed intersection)
- Shilo Inn Access with 90 degree corner (NE Pacific Avenue at East Harbor Drive)

Preliminary Traffic Signal Warrant Analysis

A preliminary traffic signal warrant analysis was conducted for unsignalized study intersections based upon Warrant 1 (Eight-Hour Vehicular Volume) from MUTCD. The analysis was based on forecasted, year 2022, 30th-highest-hour ADT volumes, as directed by the ODOT's TPAU.

Signalization should be considered at the following locations based on results of the preliminary traffic signal warrant analysis:

- East Harbor Drive and SE Neptune Avenue
- Fort Stevens Highway 104 and Warrenton-Astoria Highway 105 (East Harbor Drive and Main Avenue Intersection in Downtown Warrenton)
- US 101 and Fort Stevens Highway 104 and Perkins Lane
- Warrenton-Astoria Highway 105 (SE Marlin Avenue) and East Harbor Drive

In addition, the intersection of US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105), which was assumed to be signalized in the future, forecasted, no-build analysis, would meet the preliminary traffic signal warrant under future conditions.

Widening/Connectivity Needs

Widening or the addition of shoulders should be considered on the following roads:

- SW 9th Street
- Warrenton-Astoria Highway 105
- DeLaura Beach Lane (SW Pine Drive to Beach)

The following connectivity issues have been identified:

- **SW 2nd Street to SW Juniper Avenue connection.** A project to extend SW 2nd Street to SW Juniper Avenue would provide better connectivity in the residential area west of downtown Warrenton and reduce reliance on SW 9th Street and Fort Stevens Highway 104.
- **SE 7th Street to SE Marlin Avenue (Warrenton-Astoria Highway 105) connection.** A project to improve the existing private street (identified as 7th Street on some TSP maps) between Fort Stevens Highway 104 and SE Galena Avenue, and construct a new section of roadway between SE Galena Avenue and SE Marlin Drive would provide connectivity between downtown Warrenton and the commercial area. This connection would reduce congestion on East Harbor Drive.
- **NW/SW Juniper Avenue to Ridge Road connection.** A project to construct a new section of roadway between Ridge Road and NW/SW Juniper Avenue would provide an additional east-west connection between Ridge Road and downtown Warrenton.

Operations Projects on State Highways

Potential operations projects were included in the project list to address improved signing of tourist areas (Fort Clatsop, Fort Stevens scenic loop, and Astoria Regional Airport) along US 101 and a variable message sign on the New Youngs Bay Bridge.

Bridge

Improvement projects for bridges with sufficiency ratings less than 50 should be considered. In addition, bridge projects listed in corridor plans and STIP project lists should be implemented. As detailed in the Prioritization of Oregon Bridges for Seismic Retrofit Report completed in 1997, Phase 1 and Phase 2 seismic retrofit projects are recommended for bridges in Clatsop County.

Preservation/Overlay Projects

As described in the 2001 Pavement Condition Report by ODOT and the OHP, the State has a goal of maintaining a statewide pavement condition rating at 78 percent fair or better. In Warrenton, the following State highways are currently in poor condition:

- Warrenton-Astoria Highway 105
- Fort Stevens Highway 104
- Fort Stevens Highway 104 Spur

Overlay or roadway improvement projects would improve existing pavement condition deficiencies.

On local roads, the current pavement condition is fair to good in recently developed areas. On local roads without curbs and gutters, the pavement condition is generally poor to fair. These local roads typically serve low volumes of traffic. Therefore, overlay or preservation projects may not be warranted.

Pedestrian and Bicycle System Needs

Pedestrian and bicycle system improvements in Warrenton are recommended for State, County, and local roadways, as well as off-street pedestrian and bicycle facilities. Off-street pedestrian and bicycle facilities include the Warrenton Waterfront Trail and a network of dikes. The recommended projects are based on review of existing pedestrian and bicycle system conditions and existing pedestrian and bicycle system deficiencies and needs, as well as a review of existing State, County, and local pedestrian and bicycle plans. In general, pedestrian and bicycle improvements, ranging from sidewalks to widened shoulders, should be considered any time a roadway is improved for any reason, for the purposes of cost efficiency.

The recommended pedestrian and bicycle system improvements address gaps in connectivity and lack of crosswalks or other safety considerations. Regular maintenance of sidewalks and bicycle lanes/shoulders should be a priority to ensure access and safety for bicyclists and pedestrians. Access management should be addressed with regard to pedestrian and bicyclist safety (in addition to roadway capacity preservation).

Functional Classification and Bicycle and Pedestrian Systems

The TSP document includes a recommended functional classification system for Warrenton, as well as recommended street standards for incorporation into City code. According to the recommended street standards, bicycle lanes and sidewalks should be provided on both sides of all new arterial and collector roadways. The street standards will help to provide

more connected, safer, Warrenton pedestrian and bicycle systems as development and redevelopment occurs. In addition, proposed arterials and collectors should be retrofitted with bicycle and pedestrian improvements, where possible, because these roadways undergo roadway maintenance or other projects. Examples of proposed arterials and collectors where bike improvements are recommended include:

- DeLaura Beach Lane
- SW 9th Street
- SE Marlin Avenue
- SE Neptune Avenue

Pedestrian System Improvements on State and County Facilities

According to the ODOT Bike Inventory Program, sidewalks should be added to both sides of the street on the segments of State roadways located in Warrenton listed in Table 3-10.

TABLE 3-10
ODOT Recommended Sidewalk Facilities

Fort Stevens Highway 104	North of NE Skipanon Drive—South of SE 1st Street — Milepost (MP) 3.28-3.40
Fort Stevens Highway 104	South of SE 1st Street—South of DeLaura Beach Lane — MP 3.40-4.73
Fort Stevens Highway 104	South of DeLaura Beach Lane—North of Warrenton City limits — MP 4.73-4.82
Warrenton-Astoria Highway 105 (East Harbor Drive)	Fort Stevens Highway 104—North of SE Marlin Avenue—MP 0.00-1.54
Warrenton-Astoria Highway 105 (SE Marlin Avenue)	North of SE Marlin Avenue—North of Airport Road—MP 1.54-1.62

Further recommended pedestrian system improvements on State and County facilities located in Warrenton were derived from (1) a review of relevant existing local, regional, and State plans and policies (including the Clatsop County Transportation System Plan) and (2) an analysis of existing conditions and deficiencies based on a field visit to Warrenton in spring 2002. These improvements are summarized in Table 3-11.

TABLE 3-11
Recommended Pedestrian System Improvements on State and County Roadways

Roadway	Location
Hammond	
Fort Stevens Highway 104	Beginning (intersection with Lake Drive) to Intersection with East Harbor Drive
Near Downtown Warrenton	
Fort Stevens Highway 104** (MP 3.44–4.68)	SW 2nd Street south to Warrenton City limits
Fort Stevens Highway 104 (Pacific Avenue) (MP 1.17–3.32)	NW Warrenton Drive south to leg of NE Skipanon Drive
South and East of Downtown	
US 101(MP 4.51–5.31)	New Youngs Bay Bridge
Fort Stevens Highway 104	Intersection with SW 9th Street
Fort Stevens Highway 104 Spur	Between US 101 and Fort Stevens Highway 104
Warrenton-Astoria Highway 105 (E. Harbor Dr.)	Between US 101 and SE Marlin Avenue
DeLaura Beach Lane	Ridge Road west to facility end

** = Projects identified in the 2002-2005 ODOT STIP.

Pedestrian System Improvements on Local Facilities

Pedestrian system improvements are recommended on certain local facilities in Warrenton (see Table 3-12). Many local roadways in Warrenton have low traffic volumes, and, therefore, pedestrians can safely share the roadway with motorists and bicyclists. However, several local roadways warrant improved pedestrian facilities. The downtown Warrenton area would benefit from the addition of pedestrian amenities, such as benches, drinking fountains, trash receptacles, curb extensions, undergrounding of utilities and informational signage or historical kiosks.

TABLE 3-12
Recommended Pedestrian System Improvements on Local Roadways

Roadway	Location
Columbia Beach Lane*	Ridge Road to Fort Stevens Highway 104
SW 9th Street	Fort Stevens Highway 104 to Ridge Road
SE Neptune Avenue	East Harbor Drive to US 101
SW Alder Avenue	At SW 3rd Street/SW 4th Street

* = Project listed in Clatsop County Approved 2001-2006 Modernization List.

Americans with Disabilities Act (ADA) Compliance

New sidewalks should be constructed to ADA standards, including adequate width (3 feet minimum clear area), grade, and cross-slope. Existing sidewalks should be retrofitted with ADA-compliant facilities where necessary and when possible.

Warrenton has some ADA-compliant facilities, such as pedestrian ramps and texturized pavement, in the downtown area and at specific SETD transit stops. Pedestrian ramps should be constructed to Federal and State standards, including proper grade, landing area dimensions, and pavement quality.

The following locations should be examined with regard to ADA facility improvements:

- **Downtown Warrenton and Fort Stevens Highway 104 -** South Fort Stevens Highway 104 and its approaches, particularly in the downtown commercial area and near Warrenton High School.
- **Kamper's West Transit Stop**—Upgrade for ADA compliance.
- **Point Adams Transit Stop**— Upgrade for ADA compliance.
- **Corky's Transit Stop**— Upgrade for ADA compliance.
- **KOA Transit Stop**— Upgrade for ADA compliance.
- **Parkview Apartments Transit Stop**— Upgrade for ADA compliance.
- **SW 9th Street/SW Cedar Avenue Transit Stop**— Upgrade for ADA compliance. Access should be ensured from the transit stop to the community center.
- **SW 2nd Street/SW Alder Avenue Transit Stop**— Upgrade for ADA compliance.
- **SW Cedar Avenue/SW 7th Street**—Upgrade existing crosswalk for ADA compliance near elementary school.

Warrenton Bicycle System

Bicycle routes in Warrenton fall into two major categories:

- Shoulder bikeways/bike lanes—6-foot-wide striped shoulders with signage/markings
- Shared roadways—general minimum of 28 feet of roadway width with signage/markings

Other unmarked and unsigned roadways may accommodate bicyclists as shared roadways, but all components of the official Warrenton bicycle system should be signed and/or marked as bicycle routes per OBPP standards.

The *Clatsop County Bicycle Plan and the Clatsop County Transportation System Plan* include recommended bicycle route classification for major bicycle routes in the County, some of which apply to Warrenton. According to these County plans, US 101 and Warrenton-Astoria Highway 105 should be classified as shoulder bikeways.

The Warrenton Bicycle System should include the following roadways with the following classifications:

- Ridge Road—shoulder bikeway
- US 101—shoulder bikeway
- Fort Stevens Highway 104—shoulder bikeway
- DeLaura Beach Lane (Beach to Fort Stevens Highway 104)—shoulder bikeway

- Warrenton-Astoria Highway 105—shoulder bikeway
- Fort Stevens Highway 104 Spur—shoulder bikeway
- SW 9th Street—shoulder bikeway
- Columbia Beach Lane—shared roadway
- Old Ridge Road—shared roadway
- SE Neptune Avenue—shared roadway

Bicycle System Improvements on State and County Facilities

Recommended bicycle system improvements on State and County facilities in Warrenton were derived from (1) a review of relevant existing local, regional, and State plans and policies (including the Clatsop County Transportation System Plan) and (2) an analysis of existing conditions and deficiencies based on a field visit to Warrenton in spring 2002. These improvements are summarized in Table 3-13.

TABLE 3-13
Recommended Bicycle System Improvements on State and County Roadways

Roadway	Location
US 101*	Traffic signals through Warrenton
US 101	New Youngs Bay Bridge (MP 4.51–5.31)
Fort Stevens Highway 104**	Warrenton (MP 3.44–4.68)
Fort Stevens Highway 104 Spur	Fort Stevens Highway 104—US 101
Warrenton-Astoria Highway 105	Ridge Road—US 101
DeLaura Beach Lane*	Ridge Road—Beach

* = Projects identified in the Clatsop County TSP.
** = Projects identified in 2002-2005 ODOT STIP.

Bicycle System Improvements on Local Facilities

Bicycle system deficiencies have also been identified on certain local facilities in Warrenton. Many local roadways in Warrenton have low traffic volumes, and, therefore, bicyclists can safety share the roadway with pedestrians and motorists. However, several local roadways warrant improved bicycle facilities, which are detailed in Table 3-14.

TABLE 3-14
Bicycle System Improvements on Local Facilities

Roadway	Location
Columbia Beach Lane*	Ridge Road—Fort Stevens Highway 104
Old Ridge Road	AC section—Columbia Beach Lane
SW 9th Street	Fort Stevens Highway 104—Ridge Road
SE Neptune Avenue	East Harbor Drive—US 101

* = Project listed in Clatsop County Approved 2001-2006 Modernization List.

Bicycle Parking

Bicycle parking in Warrenton should comply with design standards set forth in the OBPP. Bicycle parking should be installed at the following activity centers in Warrenton:

- Downtown Warrenton (to serve local businesses, offices, and government buildings)
- Warrenton soccer fields on Ridge Road
- City Park (near community center)

Warrenton Trail System

The following off-street pedestrian and bicycle improvements are recommended for Warrenton:

- Trail connection between Hammond Marina and Fort Stevens State Park
- Improved signage and signage visibility for Warrenton Waterfront Trail
- Improved pedestrian amenities for Warrenton Waterfront Trail (pedestrian lighting, trash receptacles, benches, etc.)
- Construct paved bicycle/pedestrian path on top of dike near Alder Creek
- Construct paved bicycle/pedestrian path on top of dike in Hammond area of Warrenton
- Construct paved bicycle/pedestrian path on top of dike in downtown Warrenton area (east of Fort Stevens Highway 104)
- Support extension of Fort Stevens bicycle path to Sunset Beach

Transit Needs

The SETD Comprehensive Transportation Plan (June 2001) outlines opportunities to improve public transportation services offered by SETD, including the following items:

- **Decrease the reliance on single occupancy vehicles in Clatsop County.** To meet this goal, services available to low-wage workers and DAR users would need to be strengthened. In addition, the hours of operation and service frequency would need to be expanded.
- **Cut travel time.** Transit users who currently commute between Astoria and Seaside cite travel time as an inconvenience to public transit usage. As stated in the SETD Comprehensive Transportation Plan, ways to cut travel time should be explored.
- **Extend hours of operation** to allow users with alternative work schedules to use transit services.
- **Decrease the headway between buses** to minimize wait time for users.
- **Review scheduling and routes** and make changes as necessary. Incorporated communities have both residential- and tourist-related needs. Each of the incorporated communities also has both intercity and intracity public transportation needs that should be addressed.

- **Improve the efficiency of the DAR program** to serve more users. According to the SETD Comprehensive Transportation Plan, the system currently serves an average of one user per hour. By grouping DAR trips generated in the same location and assigning DAR drivers to a specific geographic zone, the program would serve more riders for the same cost throughout Clatsop County. The use of specialized software and training for DAR employees would be necessary to improve the efficiency of the program.
- **Meet the transit demands created by future development**, including the relocation of Clatsop Community College and the North Coast Business Park.
- **Consider the loss of transit connections with Washington.**
- **Improve connections** with other transit service providers. Currently, connections between transit service providers, including Pacific Transit, Oregon Coachways, and the Cannon Beach Shuttle, are not well coordinated.
- **Advertise and promote** SETD services.
- **Maximize the potential of the proposed intermodal center**, by using the facility to educate users about transit options and community events, in addition to providing an efficient transfer point between services.

In addition to the points discussed above, other transit issues were identified through the field visit and interaction with the PMT, AC, and attendees of the public open house. Other issues that have been identified include the addition of transit amenities and extended service to unincorporated areas.

Transit amenities, including covered benches, signage, and concrete landing pads, should be considered for stops with high ridership. In addition, transit pull-outs at stops with high ridership should be constructed where feasible as a safety improvement. These amenities would make the system more visible to potential users and possibly attract new users.

Currently, there is SETD service in Astoria (Route 10), between Astoria and Warrenton (Route 15), between Seaside and Cannon Beach (Route 20), in Seaside (Route 25), and between Astoria, Warrenton, and Seaside (Route 101). Because of low ridership, previous routes that provided service between Astoria and Westport and between Warrenton and Jewell through Seaside have been cancelled. Future service to connect unincorporated communities such as Arch Cape, Knappa, Westport, and Miles Crossing with incorporated communities should be considered.

Additional transit needs were listed in relevant planning documents:

- New Youngs Bay Bridge—kiosks and shelters north and south of the bridge on US 101 (Astoria TSP)
- Improve transit between the Willamette Valley and Seaside and between Cannon Beach and Astoria (Draft Oregon Coast Highway Corridor Master Plan)
- Fort Clatsop Shuttling System (2002-2005 STIP)
- Intermodal Facility Improvements (2002-2005 STIP)

Rail System Needs

There are no existing rail facilities in Warrenton.

Air System Needs

The following needs for the Astoria Regional Airport have been identified through the Astoria Airport Master Plan (1993), the Astoria TSP, and discussions with the Airport Manager:

- Runway safety areas for the 13/31 runway need to be modified to meet Federal Aviation Administration (FAA) standards.
- The existing water facilities at the airport do not meet minimum standards.

From the field inventory, improved signing to the airport and improved signing and striping within the airport area should be considered.

Currently, the Astoria Regional Airport does not provide commercial air passenger service. If commercial air passenger service is reinstated at the airport in the future, the following issues should be addressed:

- As stated in the Astoria Airport Master Plan (1993), the current access to the airport should be improved to provide a more direct access with an improved alignment. The master plan includes a conceptual plan for improved access at US 101.
- A passenger terminal building with parking might be necessary.
- The airport would need to upgrade security to meet new security requirements.

Water System Needs

Two needs were identified by the City of Warrenton Harbormaster for the Warrenton and Hammond Mooring Basins, including seasonal use and parking facilities. Use of both facilities is seasonal, with maximum use occurring from May to November. During maximum use periods, both facilities currently operate at capacity with all of the slips in use. Parking facilities at the Warrenton Mooring Basin are not adequate for the demand, causing users to park outside of the designated parking areas along local roads and State highways during peak use periods. At the Hammond Mooring Basin, parking is not a problem because there are adequate parking areas to handle the demand during peak use periods.

Pipeline Needs

No major deficiencies of the existing pipelines in Warrenton have been identified.

SECTION 4

Transportation System Plan Alternatives

To address the deficiencies and needs of the transportation system in Warrenton, five system alternatives have been identified and evaluated in this section. Each alternative was evaluated on the basis of measures of effectiveness that were developed using the goals and objectives of the Warrenton TSP. The following five system alternatives were analyzed:

- **Alternative 1: No-Build Alternative.** Under the no-build alternative, no improvements would be constructed in Warrenton during the next 20 years except for projects with committed funding. The only capacity improvement that was assumed in this alternative is the US 101 at SE Marlin Avenue Project, which has committed STIP funding. This alternative is not a viable planning alternative, because roadway, pedestrian, bicycle, transit, rail, air, water, and pipeline needs would not be addressed. The no-build alternative is included in the analysis for comparison purposes.

- **Alternative 2: Transportation System Management (TSM) Baseline Improvements.** This alternative identifies local roadway projects in downtown Warrenton and in the Hammond area that should be considered to improve traffic circulation and safety. Alternative 2 does not assume any improvements on US 101 within the City limits of Warrenton to address forecasted operational deficiencies.

- **Alternative 3: Major Capacity Improvements on US 101.** This alternative identifies which capacity improvements would be required in the vicinity of US 101 to eliminate future, forecasted, operational deficiencies compared with OHP mobility standards without construction of new roadway facilities (that is, the Astoria-Warrenton Parkway). Construction of Alternative 3 would result in five signals along US 101 within the City limits of Warrenton. This alternative was analyzed under future, forecasted, 30th-highest-hour and weekday, peak-hour conditions.

- **Alternative 4: Astoria-Warrenton Parkway and Astoria Bypass.** The Astoria-Warrenton Parkway was studied in 1999 to address community concerns about potential impacts of the Astoria Bypass. Alternative 4 identifies impacts of the Astoria-Warrenton Parkway on US 101 in Warrenton, including impacts on the New Youngs Bay Bridge. Construction of Alternative 4 would result in three signals along US 101 within the City limits of Warrenton. This alternative assumes that the Astoria Bypass improvements discussed in the Clatsop County TSP would be constructed. This alternative was analyzed under future, forecasted, 30th-highest-hour and weekday, peak-hour conditions.

- **Alternative 5: Weekday Peak-Hour Capacity Improvements.** Alternative 5 is a policy-driven alternative that was developed to determine which combination of improvements from Alternatives 2 through 4 would improve operations in Warrenton under future, forecasted, weekday, peak-hour conditions. This alternative assumes construction of the Astoria-Warrenton Parkway without additional capacity at the New Youngs Bay Bridge or the intersection of East Harbor Drive and US 101. Under

Alternative 5, the mainline segment of US 101 north of East Harbor Drive and the intersection of East Harbor Drive with US 101 would be congested during future, forecasted, weekday, peak-hour conditions and would not meet OHP mobility standards. Outside of the deficiencies identified at these locations, this alternative would meet OHP mobility standards under future, forecasted, weekday, peak-hour conditions. Alternative 5 would result in three signals along US 101 within the City limits of Warrenton. This alternative would provide additional east-west connectivity with an overpass at US 101 along the King Street extension, which would connect with the parkway alignment.

Alternatives presenting only Transportation Demand Management (TDM), transit, and land use strategies have not been included in this analysis because of the nature of the transportation system needs. As Warrenton experiences high volumes of through tourist traffic, each of these measures on their own would not address all of the transportation system needs. Therefore, TDM and transit strategies are included as part of other alternatives.

Within this section, the preferred alternative and recommended phasing of the preferred alternative are discussed.

Measures of Effectiveness

Using the goals and objectives developed for the Warrenton TSP, the measures of effectiveness shown in Table 4-1 were developed to analyze each alternative and project.

TABLE 4-1
Measures of Effectiveness

Goal	Rating	Project Criterion
Mobility/Accessibility	+	Improves transportation options or connectivity to serve different types of users (pedestrians, bicycles, freight) and the transportation disadvantaged.
	0	Does not significantly change transportation options or connectivity
	-	Reduces or limits transportation options or connectivity
Coordination	+	Included as part of other local, County, regional or State policies or plans
	0	Not specifically mentioned in other policies or plans, but not out of compliance with such plans
	-	Not in compliance with other plans and policies
Non-Motorized Users	+	Promotes an interconnected system of bicycle and/or pedestrian facilities to serve either commuters, transit users, or recreational users
	0	Does not significantly change existing non-motorized facilities
	-	Reduces the connectivity, safety, or aesthetics of existing non-motorized facilities
Transportation Funding	+	Has identified funding
	0	Has no identified funding, but potential funding anticipated as reasonable
	-	Does not have identified funding

TABLE 4-1
Measures of Effectiveness

Goal	Rating	Project Criterion
Environment	+	Preserves or enhances environmental significant areas or natural or historic features
	0	Low impacts to environmentally significant areas or natural or historic features
	-	Significantly impacts environmentally significant areas or natural or historic features
Capacity	+	Improves the capacity of the roadway network
	0	Does not significantly change the capacity of the roadway network
	-	Worsens roadway capacity
Safety	+	Improves safety for users
	0	Does not significantly change roadway/facility safety
	-	Decreases safety for users
Lifeline Routes	+	Improves the quality or identification of lifeline routes
	0	Does not significantly change the quality or identification of lifeline routes
	-	Adversely affects the effectiveness or connectivity of lifeline routes

Alternatives Analysis

For each of the five alternatives included in the analysis, this section presents a description of the alternative, a summary list of capacity projects required on major facilities, the measures of effectiveness, the advantages and disadvantages, and the analysis methodology . The no-build alternative assumes that no major capacity improvement projects will be constructed in Warrenton except for improvements at the intersection of US 101 with SE Marlin Avenue (Warrenton-Astoria Highway 105). The remaining four alternatives were developed to address the needs of the transportation system in Warrenton.

Alternative 1: No-Build Alternative

Under the no-build alternative, no improvements would be constructed in Warrenton during the next 20 years except for projects with committed funding (US 101 at SE Marlin Avenue Project). This alternative is not a viable planning alternative, because the roadway, pedestrian, bicycle, transit, rail, air, water, and pipeline needs of the transportation system would not be addressed. The no-build alternative is included in the analysis for comparison purposes.

Alternative 1—30th-Highest-Hour Analysis Summary

Alternative 1 assumes that no improvements outside of those with committed funding would be constructed in Warrenton in the 20-year planning horizon. Under Alternative 1, there would be operational deficiencies under future, forecasted, 30th-highest-hour and

weekday, peak-hour conditions. In addition, roadway, pedestrian, bicycle, transit, rail, air, water, and pipeline deficiencies would not be addressed.

Measures of Effectiveness

The measures of effectiveness show that Alternative 1 would make no progress in meeting the goals and objectives of the Clatsop County TSP.

Mobility/ Accessibility	Coordination	Non-Motorized Users	Transportation Funding	Environment	Capacity	Safety	Lifeline Routes
0	-	0	+	+	0	0	0

The advantages of Alternative 1 are:

- Low economic impacts (cost)
- Low environmental impacts

The disadvantages of Alternative 1 are:

- Existing lifeline routes are not improved
- Under future, forecasted, 30th-highest-hour and weekday, peak-hour conditions, there would be operational deficiencies throughout the City.

Alternative 2: Baseline TSM Improvements

Alternative 2 was developed to meet the goals and objectives of the Warrenton TSP with minimum construction costs and environmental impacts. Alternative 2 would improve local circulation and safety in Warrenton and the Hammond area with safety-, non-capacity-, and TSM-related projects. This alternative would not improve forecasted operational deficiencies on US 101.

Baseline TSM Improvements

Appendix A lists all of the safety-, non-capacity-, and TSM-related projects that are assumed in Alternative 2. The list includes projects identified in relevant planning documents. The list also includes short-term projects that have been approved for Warrenton with STIP funding. Projects that were identified through the analysis of existing or future, forecasted, no-build conditions; the field visit; and input from the PMT, AC, or public open house are included in the list of needs and potential projects. For each of the transportation improvements in Appendix A, preliminary order-of-magnitude cost estimates were calculated.

Appendix A groups the needs by facility and the following project categories:

- **Modernization** projects include capacity improvements to reduce congestion and improve safety. Improvements in this category include the addition of lanes on roadways or bridges to increase capacity.
- **Safety** projects include cost-effective improvements to reduce crash rates and fatalities.

- **Preservation** projects include rehabilitative work to extend the service life of existing facilities. Preservation improvements include pavement overlays and safety improvements (that is, installation of guardrail, slope flattening, striping, etc.).
- **Bridge** projects include improvements on bridges, overpasses, and culverts.
- **Maintenance** projects include improvements that relate to the appearance and functionality of a roadway system. Improvements in this category include surface repairs, drainage work, minor structural work, maintenance of signs, signals, and lighting.
- **Operations** projects include improvements that increase the efficiency of a roadway network. Improvements within this category include interconnected traffic signal systems, signs, Intelligent Transportation System (ITS) features, and rock fall or slide repairs.
- **Access management** projects identify locations where access management plans should be developed or considered on the basis of recommendations in previous planning documents.
- **Air** projects include potential improvements at the Astoria Regional Airport.
- **Pedestrian and bicycle** projects include potential improvements to better serve pedestrians and bicycles, including the addition of striped bike lanes, shoulders, and sidewalks.
- **Transit** projects include potential improvements to the existing public transportation system.
- **Water** projects include potential improvements at the Port of Astoria and Warrenton Mooring Basin.

Within Appendix A, the projects are evaluated on the basis of the measures of effectiveness.

Alternative 2 Summary

Under Alternative 2, the transportation system would be improved beyond no-build conditions through the following roadway projects, which are shown in Figure 4-1:

- **Realignment of the DeLaura Beach Lane and Ridge Road intersection.** This intersection, with sight distance issues and skewed geometry, is confusing for drivers.
- **Improvements to SW 9th Street.** 9th Street is one of two connections between Fort Stevens Highway 104 and Ridge Road. SW 9th Street serves residential traffic and is near the City Park and Warrenton Elementary School. Alternative 2 assumes that SW 9th Street will be upgraded through the addition of roadway width and shoulders, striped bike lanes, and sidewalks. This improvement would require acquisition of right-of-way from adjacent property owners.
- **Improvements to DeLaura Beach Lane.** An unofficial beach access exists at DeLaura Beach Lane. Past SW Pine Drive, the road turns to a gravel roadway section in poor condition. Alternative 2 assumes that this roadway section will be improved to provide

better access to the beach. This improvement would require acquisition of right-of-way from adjacent property owners and would likely have environmental/wetland impacts.

- **SW Juniper Avenue to SW 2nd Street connection.** Connecting these two roadways would provide better circulation in Warrenton between the downtown area and Ridge Road. This improvement may require acquisition of right-of-way from adjacent property owners and would likely have environmental/wetland impacts.

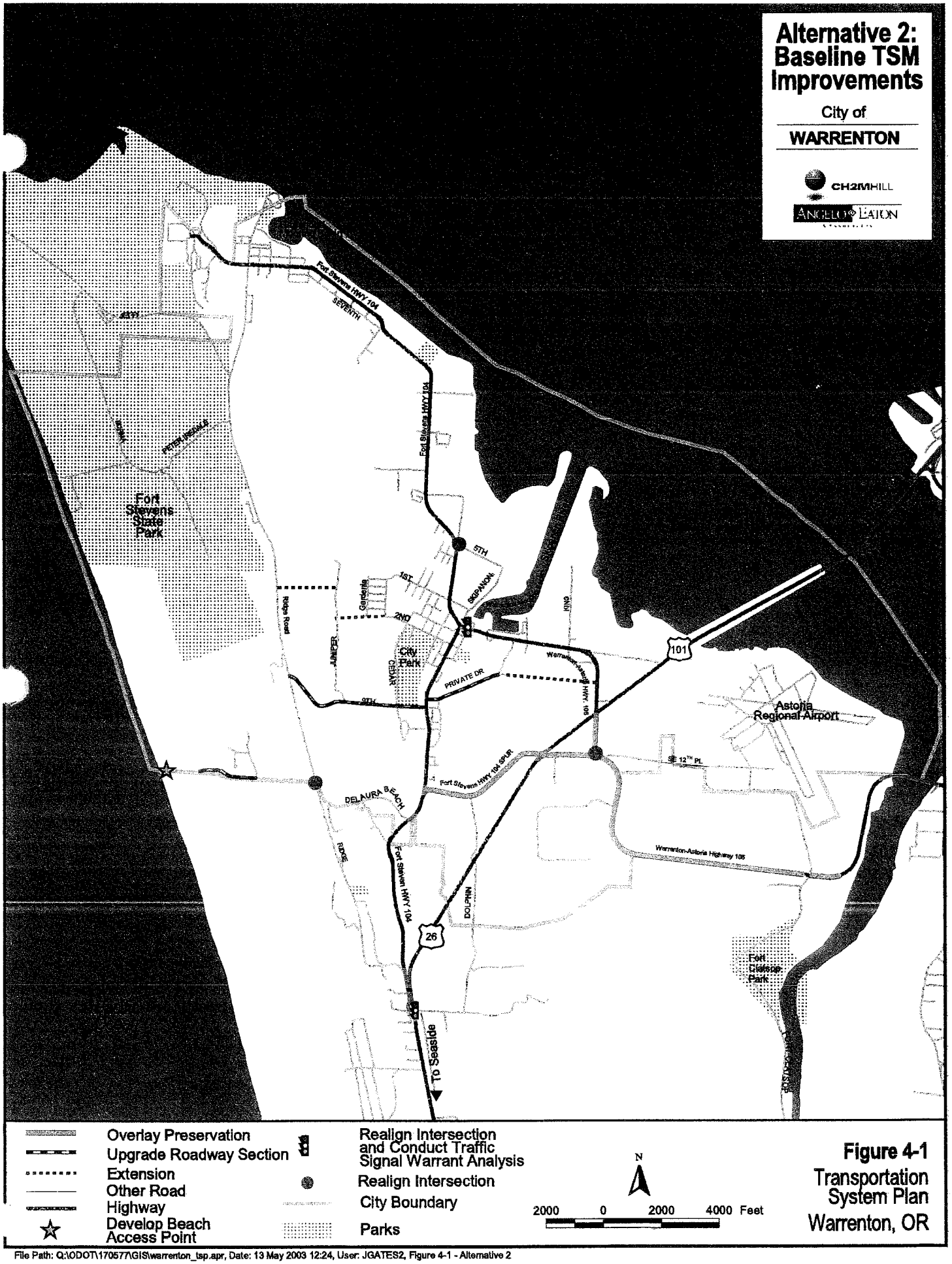
- **Connection between NW/SW Juniper Avenue and Ridge Road.** Connecting these two roadways would provide better circulation within Warrenton between the downtown area and Ridge Road. This connection would also likely reduce traffic on SW 9th Street. This improvement would require acquisition of right-of-way from adjacent property owners and would likely have environmental/wetland impacts.

- **Improvements to SE Marlin Avenue (Warrenton-Astoria Highway 105) between East Harbor Drive and US 101.** The intersection of US 101 and SE Marlin Avenue most likely will become signalized in the near future as part of the US 101 at SE Marlin Avenue Project. With the addition of a signal at this intersection, more traffic likely will use SE Marlin Avenue between East Harbor Drive and US 101. This section of roadway currently has no curb, with narrow shoulders and a ditch section. Alternative 2 assumes that this section of roadway will be upgraded through the addition of shoulders, striped bike lanes, and sidewalks. .This improvement would require acquisition of right-of-way from adjacent property owners.

- **Realignment of the Fort Stevens Highway 104 and NE 5th Street intersection.** This intersection, which currently serves high volumes of trucks from the nearby industrial areas, was identified by the Advisory Committee as an intersection that should be realigned. This improvement would require acquisition of right-of-way from adjacent property owners.

- **Overlay preservation projects on State highways with poor pavement condition.** Fort Stevens Highway 104 Spur and Warrenton-Astoria Highway 105 south of US 101 were identified in the analysis of existing conditions as having poor pavement condition.

- **Realignment and traffic control modifications at the Fort Stevens Highway 104 and US 101 intersection.** This intersection was a top 25 percent SPIS site in year 2001 and a top 10 percent SPIS site in years 2000, 1999, and 1998. Although this intersection is outside the City limits of Warrenton, this intersection was included in Alternative 2 because it affects traffic in downtown Warrenton. Under future, forecasted, no-build conditions, the intersection of Fort Stevens Highway 104 and US 101 meets the preliminary traffic signal warrant. US 101 is a four-lane section with a 45-mph speed limit at this intersection, making turn movements from Fort Stevens Highway 104 difficult and unsafe during peak volumes. Therefore, a traffic signal at this location should be considered. A traffic signal at this location would need to be approved by the State Traffic Engineer. Due to the rural nature of the intersection, a signal in this location would not be expected by drivers. Alternatives to signalization, including an interchange and making the approaches on Fort Stevens Highway 104 and Perkins Lane right-out, should be considered. Major improvements at this intersection would require acquisition of right-of-way from adjacent property owners.



File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:24, User: JGATES2, Figure 4-1 - Alternative 2

- **Realignment and Signalization of Warrenton-Astoria Highway 105 and Fort Stevens Highway 104 intersection.** As shown in the analysis of future, no-build conditions, the intersection of Fort Stevens Highway 104 and Warrenton-Astoria Highway 105 in downtown Warrenton would not meet OHP mobility standards under forecasted, 2022 30th-highest-hour conditions. The intersection is forecasted to have a v/c ratio of 0.89 under future, forecasted, no-build conditions, which slightly exceeds the OHP mobility standard of 0.85. Under future, forecasted conditions, the intersection would meet the preliminary traffic signal warrant because of high ADT volumes on the south, west, and east approaches. To meet the OHP mobility standards with a traffic signal at this intersection, additional lanes would be required at the intersection. Additional lanes would include a right-turn lane on the west and east side of the intersection, and additional lanes on the north and south approaches. Reconfiguration of this intersection to accommodate truck turning movements and meet OHP mobility standards would create right-of-way impacts with surrounding properties.

- **Extend Private Drive (SE 7th Street) to SE Marlin Drive (Warrenton-Astoria Highway 105).** Making this connection would create better circulation between downtown Warrenton and the commercial area on the east and reduce traffic volumes on East Harbor Drive. Significant improvements would be required along the private drive (SE 7th Street) and a bridge would be required over the Skipanon Slough. Since SE 7th Street is currently a private drive, right-of-way would need to be acquired for this improvement. Traffic associated with Fort Stevens State Park shall be discouraged from using this local street through appropriate design and signage. Consideration shall be made to align this roadway extension to make a connection with the Hwy 104 Spur as opposed to SE Marlin Avenue. According to the existing zoning of Warrenton, the area between the Skipanon Slough and SE Marlin Avenue is zoned Intermediate Density Residential and General Commercial. Therefore, this connection would allow access to future development. This improvement would likely have significant environmental/ wetland impacts.

- **Realignment of the Warrenton-Astoria Highway 105 and SE 12th Place intersection to the airport.** This intersection, which provides access to the Astoria Regional Airport, currently has skewed intersection geometry. Alternative 2 assumes realignment of this intersection and improved signing to the airport. This improvement would require acquisition of right-of-way from adjacent property owners.

Alternative 2 would also include pedestrian, bicycle, transit, air, and water projects.

Measures of Effectiveness

The measures of effectiveness show that Alternative 2 would make progress in meeting the goals and objectives of the Warrenton TSP. With the identified roadway, pedestrian, bicycle, transit, rail, air, and water projects, this alternative improves mobility/accessibility, options for non-motorized users, and safety. Alternative 2 is consistent with other relevant plans and policies.

Mobility/ Accessibility	Coordination	Non-Motorized Users	Transportation Funding	Environment	Capacity	Safety	Lifeline Routes
+	+	+	0	0	0	+	0

The advantages of Alternative 2 are:

- Improved operations on the local roadway network in Warrenton
- Low costs compared with other alternatives
- Low environmental impacts compared with other alternatives

The disadvantages of Alternative 2 are:

- 30th-highest-hour operational deficiencies would exist in Warrenton.
- Existing lifeline routes would not be significantly improved.

Summary

Alternative 2 would improve conditions in Warrenton and meet most of the goals and objectives. As shown through the measures of effectiveness, Alternative 2 would not significantly improve lifeline routes or capacity on US 101, which is the primary transportation corridor through Warrenton. To address both of these goals and objectives, Alternatives 3 and 4 were developed and analyzed. Each of these alternatives identifies which capacity improvements would be necessary on State facilities to meet OHP mobility standards under future, forecasted 30th-highest-hour and weekday, peak-hour conditions and improve lifeline/alternate routes. Alternatives 3 through 5 do not include baseline TSM improvements within Warrenton.

Alternative 3: Major Capacity Improvements on US 101

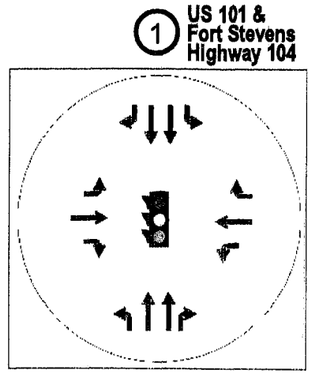
Alternative 3 was developed to determine which capacity improvements would be necessary to eliminate future, forecasted (2022), no-build, 30th-highest-hour, operational deficiencies in Warrenton without construction of new sections of roadway (that is, the Astoria-Warrenton Parkway, frontage roads, or new connections). The operational analysis results of future, forecasted, weekday, peak-hour conditions also are presented for Alternative 3. However, the summary performance of Alternative 3 is presented for only the forecasted 30th-highest-hour conditions.

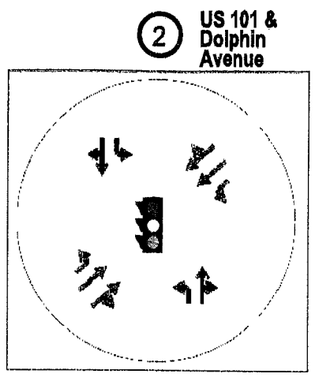
Alternative 3—30th-Highest-Hour Analysis Summary

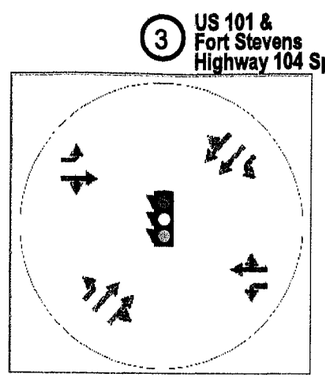
To eliminate future, forecasted, operational deficiencies under 30th-highest-hour conditions, capacity improvements would be required in the following locations, which are shown in Figure 4-2:

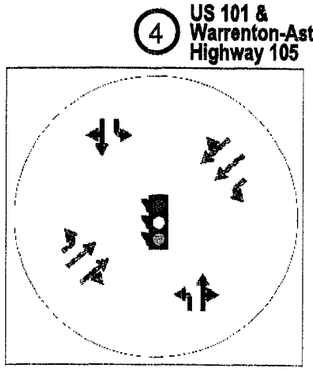
- Signalization of the SE Dolphin Avenue at US 101 intersection (Note: Realignment of this intersection is required in the Warrenton Land & Investment Zone Change, 2000).
- Signalization of the US 101 at Fort Stevens Highway 104 Spur intersection
- Additional eastbound left-turn lane at the East Harbor Drive and US 101 intersection
- Widen US 101 to a four-lane section within the City limits of Warrenton
- Additional capacity on the New Youngs Bay Bridge
- Signalization of the East Harbor Drive at SE Neptune Avenue intersection

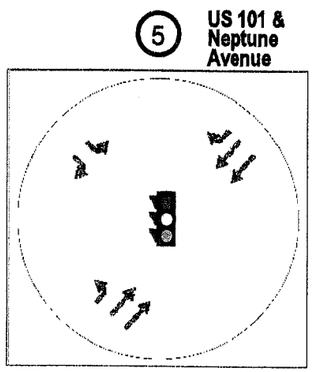
- Signalization and addition of westbound left-turn lane at the East Harbor Drive and SE Marlin Avenue (Warrenton-Astoria Highway 105) intersection

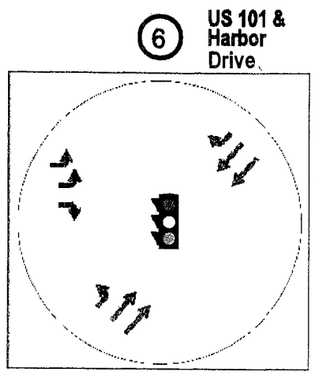


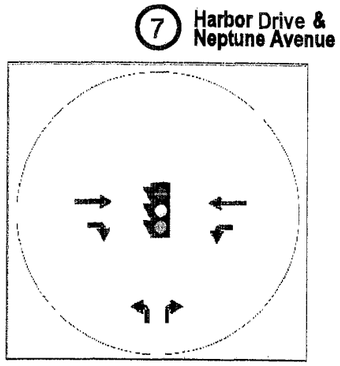


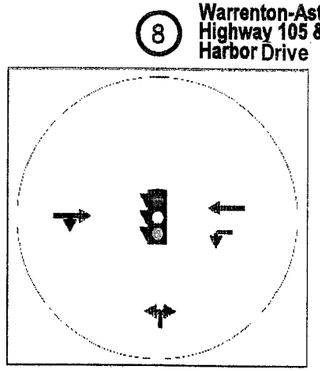


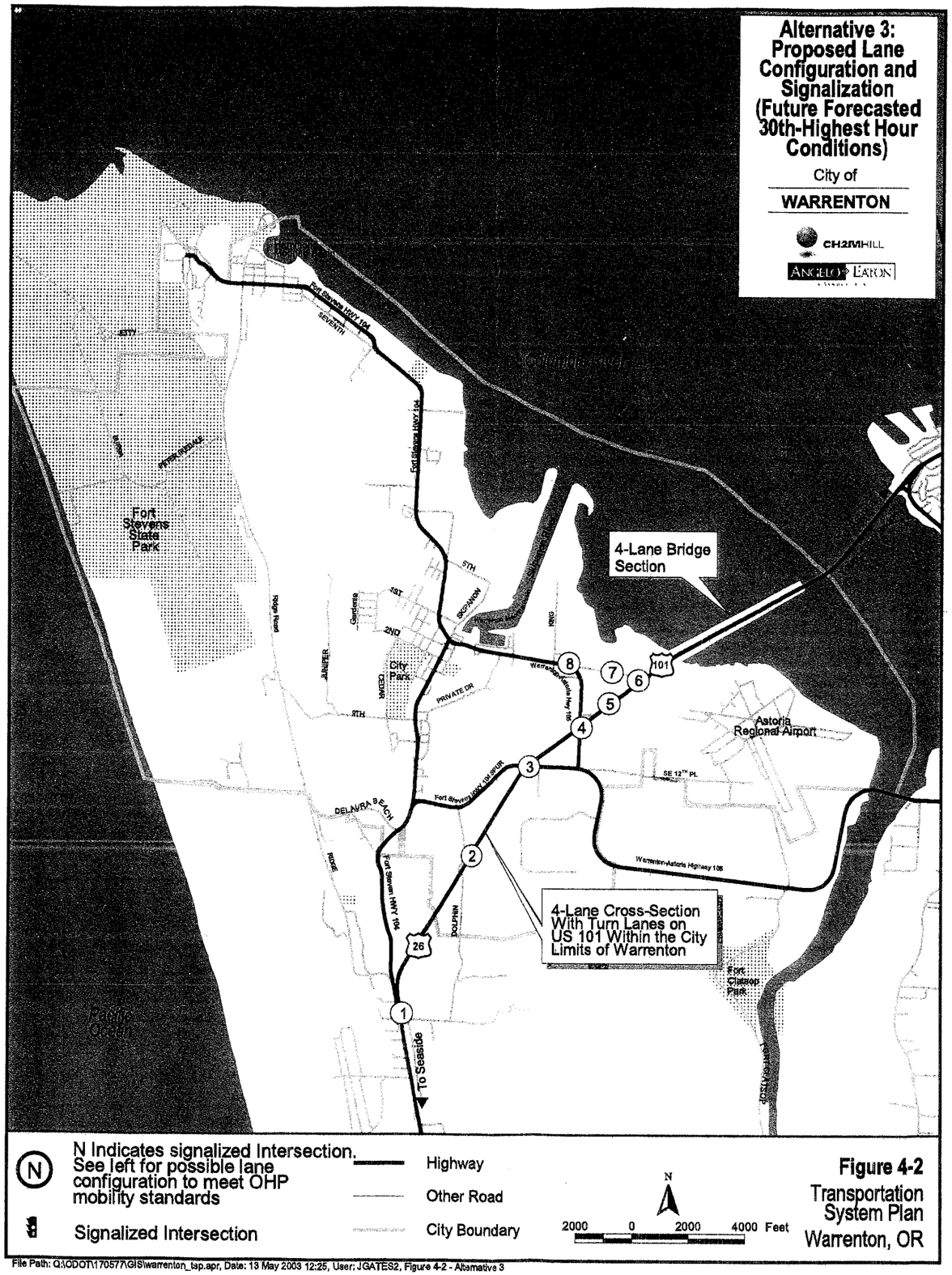












File Path: Q:\ODOT\17057\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:25, User: JGATES2, Figure 4-2 - Alternative 3

Construction of Alternative 3 would result in five signals along US 101 within the City limits of Warrenton.

Measures of Effectiveness

The measures of effectiveness show that Alternative 3 would meet the capacity and lifeline route goals of the Warrenton TSP. Because Alternative 3 includes major capacity improvements on US 101, the transportation system in Warrenton would meet OHP mobility standards under forecasted 30th-highest-hour conditions. However, the alternative would have high environmental and economic impacts and is not consistent with other planning documents and policies.

Mobility/ Accessibility	Coordination	Non-Motorized Users	Transportation Funding	Environment	Capacity	Safety	Lifeline Routes
0	-	0	-	-	+	0	+

The advantages of Alternative 3 are:

- Transportation system in Warrenton would meet OHP mobility standards under forecasted 30th-highest-hour conditions.
- Alternative 3 would significantly improve existing lifeline/alternate routes.

The disadvantages of Alternative 3 are:

- High environmental impacts in comparison to the baseline alternative due to major widening on US 101 and additional capacity on the New Youngs Bay Bridge.
- High costs compared to the baseline alternative
- Construction of Alternative 3 would result in five signals on US 101, which does not meet the IGA between the City of Warrenton and ODOT.

Alternative 3—30th-Highest-Hour Analysis Methodology

Using the future, forecasted, 30th-highest-hour, no-build analysis volumes and Synchro, capacity improvements that are necessary for the existing roadway network to meet OHP mobility standards were identified.

- **US 101 and SE Dolphin Avenue.** Under future, forecasted, no-build, 30th-highest-hour conditions, the minor approaches at this intersection would operate over capacity. At this intersection, there are heavy through movements on US 101, making it difficult for minor movements to cross US 101. Under future, forecasted, no-build conditions, this intersection would not meet the preliminary signal warrant because the minor traffic volumes are fairly low. By adding additional through lanes on US 101 and left turn lanes on the minor approaches of SE Dolphin Avenue, the minor turn movements would operate over capacity under 30th-highest-hour conditions. With high volumes on US 101 and the possibility of additional through lanes, left-turn movements from the minor approaches would be difficult and unsafe. By signalizing this intersection and adding additional through lanes on US 101 and turn lanes on SE Dolphin Avenue, the

intersection would meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions. (Note: Realignment of this intersection is required in the Warrenton Land & Investment Zone Change, 2000).

- **US 101 and Fort Stevens Highway 104 Spur**. Under future, forecasted, no-build, 30th-highest-hour conditions, the minor approaches at this intersection would operate over capacity. At this intersection, there are heavy through movements on US 101, making it difficult for minor movements to cross US 101. There have been serious accidents at this intersection, including a fatality, in the past 5 years. Under future, forecasted, no-build conditions, this intersection would not meet the preliminary signal warrant because the minor traffic volumes are fairly low. By adding additional through lanes on US 101 and left-turn lanes on the minor approaches of Fort Stevens Highway 104 Spur, the minor turn movements will still operate over capacity under 30th-highest-hour conditions. With high volumes on US 101 and the possibility of additional through lanes, left turn movements from the minor approaches would be difficult and unsafe. By signalizing this intersection and adding additional through lanes on US 101, the intersection would meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions.

- **US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105)**. Under the proposed project for this intersection, a left-turn lane and shared through/right-turn lane will be constructed on each SE Marlin Avenue approach to US 101. On US 101, there will be a three-lane section, with left-turn lanes on each approach and a shared through/right-turn lane. With a signal at this intersection, which most likely will be constructed in the near future, the proposed configuration will not meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions because all the US 101 movements will have v/c ratios exceeding 0.75. To meet OHP mobility standards under future, forecasted conditions, additional through lanes would need to be added on both US 101 approaches.

- **US 101 and SE Neptune Avenue**. This intersection is currently signalized and will not meet OHP mobility standards under future ,forecasted, no-build, 30th-highest-hour conditions. To meet OHP mobility standards in year 2022, additional through lanes would need to be added to US 101.

- **US 101 and East Harbor Drive**. This intersection is currently signalized and does not meet OHP mobility standards under existing or future, forecasted, no-build, 30th-highest-hour conditions. To meet OHP mobility standards in year 2022, additional through lanes on US 101 and an additional eastbound left-turn lane on East Harbor Drive would need to be added.

- **New Youngs Bay Bridge**. As discussed in the alternative analysis for the Clatsop County TSP, the New Youngs Bay Bridge currently operates over capacity during 30th-highest-hour conditions. To meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions, the bridge would need to be widened to a four-lane section.

  If the New Youngs Bay Bridge is not widened to a four-lane section, the bridge will act as a "bottleneck" during 30th-highest-hour conditions. As a two-lane section, the bridge will operate over capacity (v/c ratio of more than 1.0), which will result in queuing and high delay times for drivers on the bridge. If the New Youngs Bay Bridge were to

remain a two-lane section, there would be heavy northbound queuing on US 101 in Warrenton because of high delay times on the bridge. In the southbound direction, traffic volumes in Warrenton actually would be less than what was assumed in this analysis because the bridge would not be able to serve all of the demand.

- **East Harbor Drive and SE Neptune Avenue.** Under existing 30th-highest-hour conditions, this unsignalized intersection operates above OHP mobility standards. Under future, forecasted conditions, the high through volumes on East Harbor Drive make minor turn movements from SE Neptune Avenue difficult. Currently, this intersection is unsignalized, but meets the preliminary signal warrant under future, forecasted conditions. By signalizing this intersection, the intersection would meet OHP mobility standards in year 2022 under 30th-highest-hour conditions. The westbound left-turn lane would need to be at least 250 feet long to provide storage length for the 95th percentile queue.
- **East Harbor Drive and SE Marlin Avenue (Warrenton-Astoria Highway 105).** Under future, forecasted, no-build, 30th-highest-hour conditions, the minor turn movements at this unsignalized intersection operate above OHP mobility standards. With high through volumes on East Harbor Drive, this intersection meets the preliminary traffic signal warrant under future, forecasted conditions. By adding a signal and westbound left-turn lane at this intersection, the intersection would meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions.
- US 101. As described above, additional through lanes would need to be added to US 101 to meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions with Alternative 3. With a four-lane section, US 101 could be designated an expressway.

Alternative 3—Weekday Peak-Hour Analysis Summary

To eliminate future, forecasted, operational deficiencies under weekday peak-hour conditions, capacity improvements would be required in the following locations:

- Addition of a left-turn lane on the southbound SE Dolphin Avenue approach (Note: Realignment of this intersection is required in the Warrenton Land & Investment Zone Change, 2000).
- Addition of a southbound through lane on US 101 at SE Marlin Avenue (Warrenton-Astoria Highway 105) and SE Neptune Avenue
- Additional eastbound left-turn lane on the East Harbor Drive approach to US 101. Additional southbound and northbound through lane on US 101 at East Harbor Drive
- Widen the New Youngs Bay Bridge to a four-lane section.
- Signalization of the East Harbor Drive at SE Neptune Avenue intersection

Construction of Alternative 3 would result in three signals along US 101 within the City limits of Warrenton using future, forecasted, weekday, peak-hour volumes as the design hour instead of the forecasted 30th-highest-hour volumes.

Alternative 3—Weekday Peak-Hour Analysis Methodology

Using the future, forecasted, weekday, peak-hour, no-build analysis volumes and Synchro, capacity improvements that are necessary for the existing roadway network to meet OHP mobility standards were identified.

- **US 101 and SE Dolphin Avenue**. Under future, forecasted, no-build, weekday, peak-hour conditions, the southbound left-turn movement would operate over capacity. Under future, forecasted, no-build conditions, this intersection would not meet the preliminary signal warrant because the minor traffic volumes are fairly low. By adding a southbound left-turn lane on SE Dolphin Avenue, the unsignalized intersection would operate under the OHP mobility standard during future, forecasted, weekday, peak-hour conditions. (Note: Realignment of this intersection is required in the Warrenton Land & Investment Zone Change, 2000).

- **US 101 and Fort Stevens Highway 104 Spur**. Under future, forecasted, no-build, weekday, peak-hour conditions, this intersection would meet OHP mobility standards.

- **US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105)**. Under the proposed project for this intersection, a left-turn lane and shared through/right- turn lane will be constructed on each SE Marlin Avenue approach to US 101. On US 101, there will be a three-lane section, with left-turn lanes on each approach and a shared through/right-turn lane. With a signal at this intersection, which most likely will be constructed in the near future, the proposed configuration will not meet OHP mobility standards under future, forecasted, weekday, peak-hour conditions with a v/c ratio of 0.80. By adding an additional southbound through lane on US 101, the intersection would meet OHP mobility standards under future, forecasted, weekday, peak-hour conditions.

- **US 101 and SE Neptune Avenue**. Currently, this intersection is signalized and will not meet OHP mobility standards under future, forecasted, weekday, peak-hour conditions with a v/c ratio of 0.77. To meet OHP mobility standards in year 2022, an additional southbound through lanes would need to be added to US 101.

- **US 101 and Harbor Street**. Currently, this intersection is signalized and does not meet OHP mobility standards under future, forecasted, weekday, peak-hour conditions. To meet OHP mobility standards in year 2022, additional through lanes on US 101 and an additional left-turn lane on Harbor Street would need to be added.

- **New Youngs Bay Bridge**. As discussed in the alternative analysis for the Clatsop County TSP, the New Youngs Bay Bridge currently operates over capacity during 30th-highest-hour conditions. To meet OHP mobility standards under future, forecasted, weekday, peak-hour conditions, the bridge would need to be widened to a four-lane section. If the New Youngs Bay Bridge is not widened to a four-lane section, the bridge will act as a "bottleneck" during 30th-highest-hour conditions. As a two-lane section, the bridge will operate at capacity (v/c ratio of 1.0), which will result in queuing and high delay times for drivers on the bridge.

- **East Harbor Drive and SE Neptune Avenue.** Under future, forecasted, weekday. peak-hour conditions, the high through volumes on East Harbor Drive make minor turn movements from SE Neptune Avenue difficult. Currently, this intersection is

unsignalized, but meets the preliminary signal warrant under future, forecasted conditions. By signalizing this intersection, the intersection would meet OHP mobility standards in year 2022 under weekday peak-hour conditions.

Alternative 4: Astoria-Warrenton Parkway and Astoria Bypass

The Astoria Bypass concept was developed to alleviate congestion and reduce truck traffic in downtown Astoria. The alignment of the Astoria Bypass would begin just west of the John Day River Bridge on US 30 and continue west to OR 202 at Williamsport Road. The alignment then would continue west along OR 202 to Smith Point and continue north for 0.5 miles along US 101. As shown in the analysis of the Astoria Bypass in the Clatsop County TSP, construction of the Astoria Bypass would have no impacts on the New Youngs Bay Bridge. Traffic using the bypass route still would use the New Youngs Bay Bridge to access US 101 south of Astoria. Therefore, construction of the Astoria Bypass would require the same improvements detailed under Alternative 3 along US 101 in Warrenton. The Astoria Bypass was not included as an alternative in the Warrenton TSP because it would operate like a no-build alternative and require major capacity improvements along US 101 in Warrenton.

Alternative 4 includes the Astoria-Warrenton Parkway, which is detailed in a study completed in April 1999. The Astoria-Warrenton Parkway alignment was studied at the request of the Astoria community to address concerns arising about the Astoria Bypass, including increased traffic in front the high school and the New Youngs Bay Bridge, operations at the Smith Point intersection and Miles Crossing Road, safety at several intersections, and maintenance of the two bridges along Warrenton-Astoria Highway 105.

Alternative 4 includes projects associated with the Astoria Bypass from the John Day River Bridge to OR 202. The Astoria-Warrenton Parkway alignment would begin at the intersection of OR 202 and Warrenton-Astoria Highway 105, continue south across the Old Youngs Bay Bridge, and then continue west along Warrenton-Astoria Highway 105. A new east-west section of roadway would link Warrenton-Astoria Highway 105 with US 101 near Dolphin Road, where an interchange most likely would be necessary. Street improvements would be necessary along existing sections of OR 202 and Warrenton-Astoria Highway 105, including sidewalks, bicycle improvements, access management projects, replacement of the Old Youngs Bay and Lewis and Clark Bridges, and the construction of turn lanes. The Astoria-Warrenton Parkway would serve as a truck route, reducing truck traffic through Astoria and Warrenton.

The operational analysis results of both future, forecasted, 30th-highest-hour and weekday, peak-hour conditions are included for Alternative 4. However, the summary performance of Alternative 4 is presented only for the forecasted, 30th-highest-hour conditions.

With construction of the Astoria-Warrenton Parkway, a traffic signal or interchange would be constructed on US 101 just north of the existing intersection with SE Dolphin Avenue. As previously mentioned, realignment of the US 101 and Dolphin Road intersection is required in the Warrenton Land & Investment Zone Change, 2000, to support future development. ODOT's Preliminary Design Group has developed a concept for an interchange at this location. However, the alignment of new roadway and connection would need to be studied further.

Alternative 4—30th-Highest-Hour Analysis Summary

To eliminate future, forecasted, operational deficiencies under 30th-highest-hour conditions with Alternative 4, capacity improvements would be required in the vicinity of Warrenton in the following locations (see Figure 4-3):

- Improvements associated with the Astoria-Warrenton Parkway, including a new section of road between US 30 and OR 202; improvements along OR 202; improvements along Warrenton-Astoria Highway 105; and a new section of roadway between Warrenton-Astoria Highway 105 and US 101
- Interchange at the realigned SE Dolphin Avenue, Astoria-Warrenton Parkway, and US 101 intersection
- Additional right-turn lanes on the SE Marlin Avenue (Warrenton-Astoria Highway 105) approaches to US 101
- Additional eastbound left-turn lane at the East Harbor Drive and US 101 intersection
- Widen US 101 to a four-lane section between East Harbor Drive and Astoria
- Widen the New Youngs Bay Bridge to a four-lane section
- Signalization of the East Harbor Drive at SE Neptune Avenue intersection
- Signalization and addition of westbound left-turn lane at the East Harbor Drive and SE Marlin Avenue (Warrenton-Astoria Highway 105) intersection

With an interchange at SE Dolphin Road, construction of Alternative 4 would result in three signals within the City limits of Warrenton on US 101.

Alternative 4 also assumes that the Astoria Bypass improvements detailed in the Clatsop County TSP would be constructed to route traffic from US 30 to US 101.

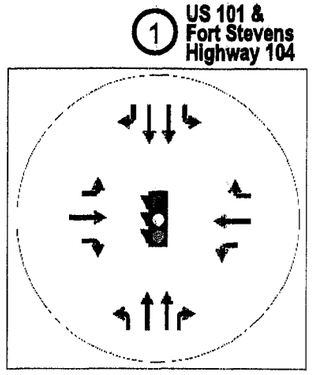
Measures of Effectiveness

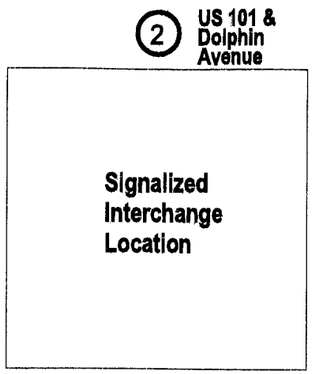
The measures of effectiveness show that Alternative 4 would meet the capacity, mobility, coordination, and lifeline route goals of the Clatsop County TSP. However, the alternative would have high environmental and economic impacts.

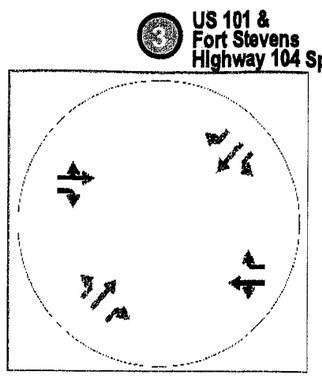
Mobility/ Accessibility	Coordination	Non-Motorized Users	Transportation Funding	Environment	Capacity	Safety	Lifeline Routes
+	+	+	-	-	+	0	+

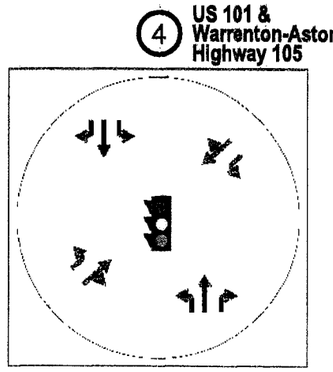
The advantages of Alternative 4 are:

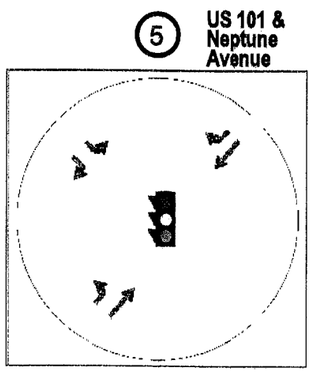
- Warrenton transportation system would meet OHP mobility standards under forecasted, 30th-highest-hour conditions.
- Improves existing lifeline/alternate routes and adds new lifeline routes to the system
- Three signals along US 101 within the City limits of Warrenton

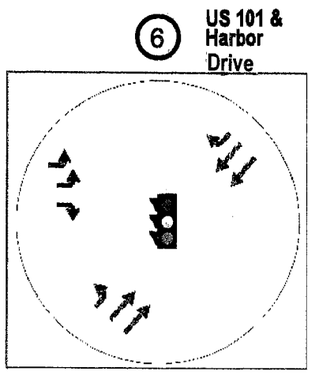


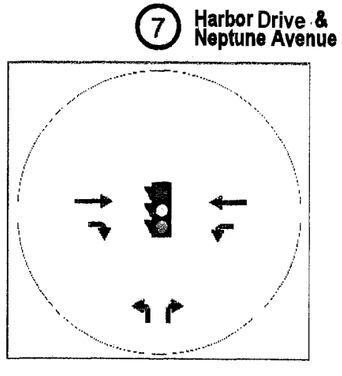


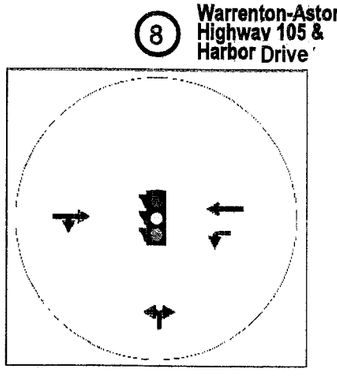


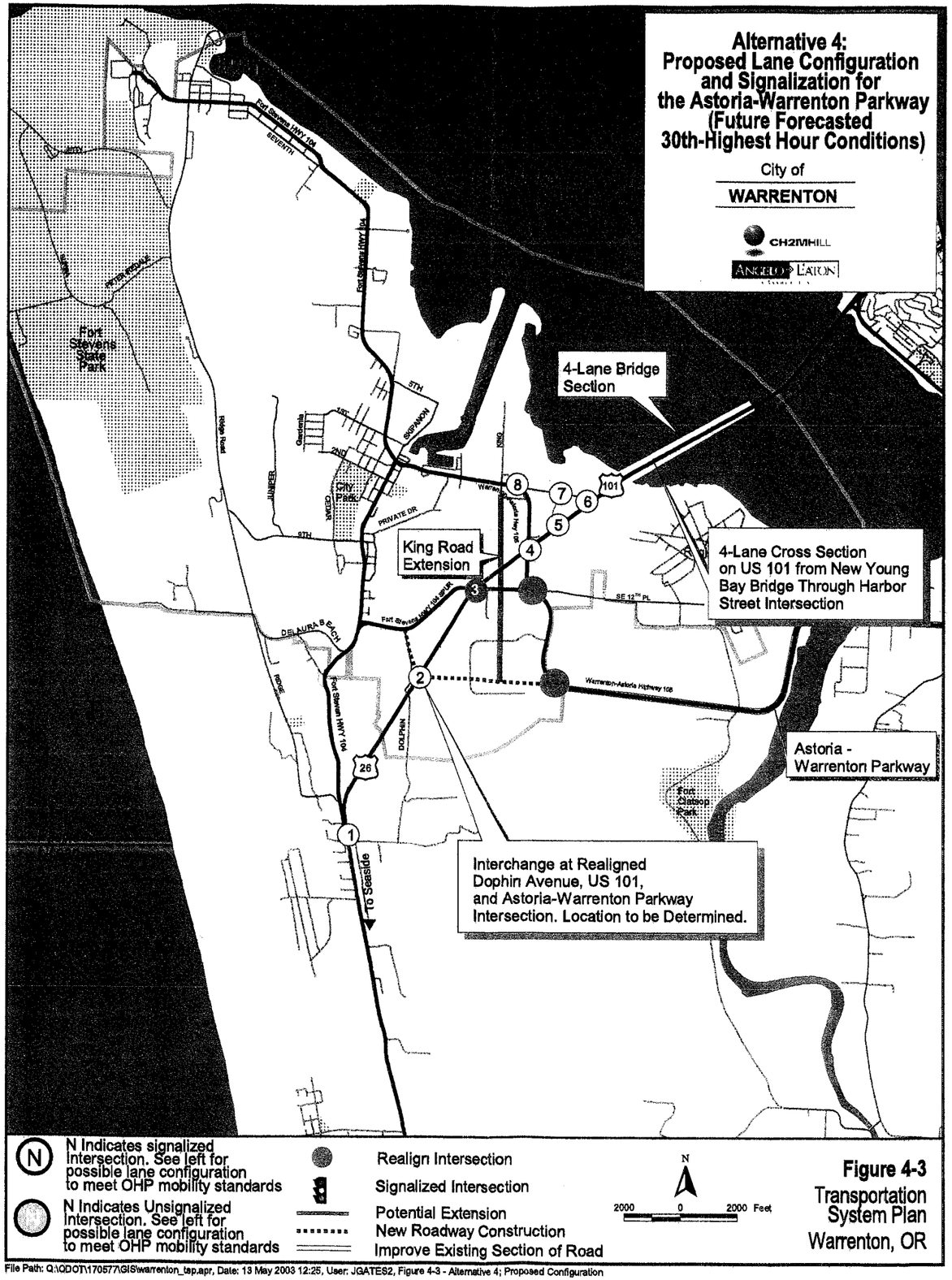












File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:25, User: JGATES2, Figure 4-3 - Alternative 4; Proposed Configuration

The disadvantages of Alternative 4 are:

- High environmental impacts compared with other alternatives due to construction of the Astoria-Warrenton Parkway and additional capacity on the New Youngs Bay Bridge.
- High costs compared with other alternatives

Alternative 4—30th-Highest -our Analysis Methodology

Traffic forecasts from the Astoria-Warrenton Parkway Study completed in 1999 were used to evaluate the operational performance of Alternative 4. The 1999 study by David Evans and Associates included an EMME/2 model of year 2016, forecasted, weekday, peak-hour volumes. Using historical growth rates calculated for State facilities, the year 2016 EMME/2 volumes were forecasted to year 2022, weekday, peak-hour volumes. Figure 4-4 displays the forecasted, year 2022, weekday, peak-hour volumes along the Astoria-Warrenton Parkway alignment.

To analyze future, forecasted, 30th-highest-hour conditions under Alternative 4, the weekday peak-hour volumes shown in Figure 4-4 were increased to 30th-highest-hour volumes using seasonal adjustment factors. Figure 4-5 displays the forecasted, year 2022, 30th-highest-hour volumes along the Astoria-Warrenton Parkway alignment.

As shown in Figures 4-4 and 4-5, the new section of roadway constructed between OR 202 and US 30 is expected to carry 77 percent of the traffic that currently uses US 30 at the John Day Bridge. This assumption is consistent with previous modeling work for the Astoria Bypass and Astoria-Warrenton Parkway alignments.

Under the methodology in the Clatsop County TSP, the New Youngs Bay Bridge is forecasted to serve 3,880 vehicles per hour under no-build, 30th-highest-hour conditions (2022). Under the methodology in the Warrenton TSP, which uses turn movement counts, the New Youngs Bay Bridge is forecasted to serve 3,415 vehicles per hour under 30th-highest-hour conditions (2022). This results in a difference of 465 vehicles during future, forecasted, 30th-highest-hour conditions between the two analyses. This difference does not change the results of the Clatsop County or Warrenton TSP analyses, because the bridge does not have the capacity to accommodate either volume.

Under previous modeling work for the Astoria-Warrenton Parkway, a significant shift in traffic volumes occurs on the west end of the Astoria-Warrenton Parkway project limits. In year 2016, a shift of 400 vehicles (both directions) is expected to occur from the New Youngs Bay Bridge to the Old Youngs Bay Bridge during forecasted, weekday, peak-hour conditions. In year 2022, a shift of approximately 460 vehicles (both directions) would be expected during weekday, peak-hour conditions. Using a seasonal adjustment factor of 1.35, the shift would increase to 620 vehicles per hour (both directions) during 30th-highest-hour conditions, which is 17 percent of the Astoria-Warrenton Parkway model 2022 30th-highest-hour, no-build volume over the New Youngs Bay Bridge.

Using this same percentage with the no-build, 2022 volumes developed for the Warrenton TSP, there would be a shift of 575 vehicles from the New Youngs Bay Bridge to the Old

Youngs Bay Bridge under 30th-highest-hour conditions. This shift in traffic will create noticeable changes in traffic volumes along US 101 in Warrenton. Assuming a directional split of 55 percent southbound and 45 percent northbound, this would result in a shift of 315 vehicles southbound and 260 vehicles northbound from the New Youngs Bay Bridge to the Old Youngs Bay Bridge. The no-build, 2022 volumes along US 101 between the Harbor Street and Dolphin Road that were developed for the Warrenton TSP were adjusted by 575 vehicles (315 southbound and 260 northbound) to analyze Alternative 4. The volumes at the Fort Stevens Highway 104 and US 101 intersection also were adjusted to match the volumes forecasted in the Astoria-Warrenton Parkway study. Figure 4-6 displays the adjusted 30th-highest-hour volumes for the Astoria-Warrenton Parkway.

Using the adjusted future, forecasted, 30th-highest-hour volumes for Alternative 4 shown in Figure 4-6 and Synchro, capacity improvements that are necessary for the existing roadway network to meet OHP mobility standards were identified:

- **US 101 and SE Dolphin Avenue**. Under future, forecasted, 30th-highest-hour conditions for Alternative 4, significant improvements would be required at this intersection because the Astoria-Warrenton Parkway would intersect US 101 at this location. ODOT's Preliminary Design Unit has developed a concept for an interchange just north of this location. The SE Dolphin Avenue approach north of US 101 would be realigned with US 101 at the interchange location. Additional lanes on US 101 would be required to accommodate the heavy northbound right-turn and westbound left-turn movements. (Note: Realignment of this intersection is required in the Warrenton Land & Investment Zone Change, 2000).

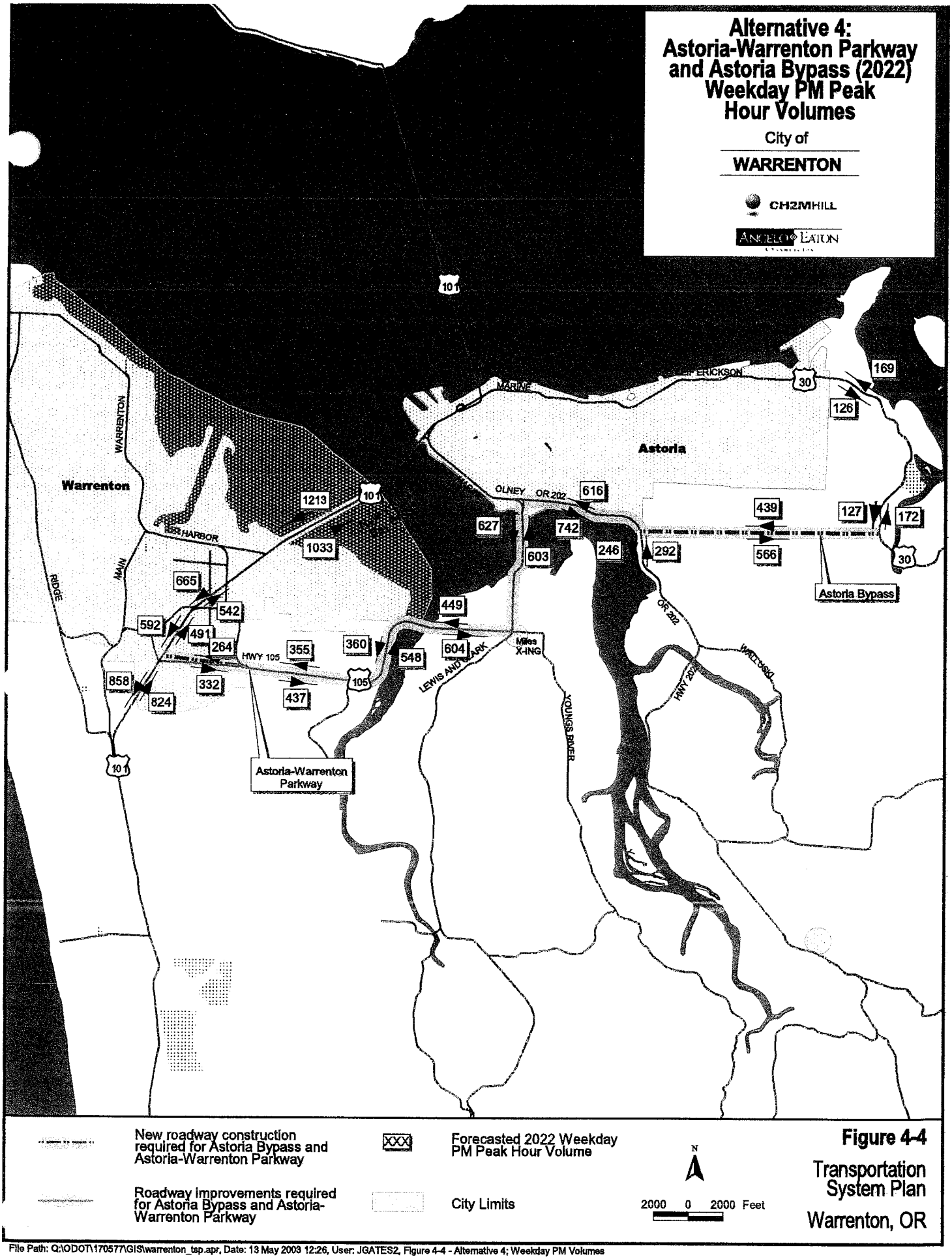
- **US 101 and Fort Stevens Highway 104 Spur**. With construction of the Astoria-Warrenton Parkway, this intersection would meet OHP mobility standards under future conditions because of the significant shift of traffic from US 101 to the parkway alignment. Therefore, no additional lanes on US 101 or the Fort Stevens Highway 104 Spur approaches would be required to meet OHP mobility standards in 2022 with construction of the Astoria-Warrenton Parkway.

- **US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105)**. Under the proposed project for this intersection, a left-turn lane and shared through/right-turn lane will be constructed on each SE Marlin Avenue approach to US 101. On US 101, there will be a three-lane section, with left-turn lanes on each approach and a shared through/right-turn lane. To meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions with construction of the Astoria-Warrenton Parkway, right-turn lanes would need to be constructed on the SE Marlin Avenue approaches.

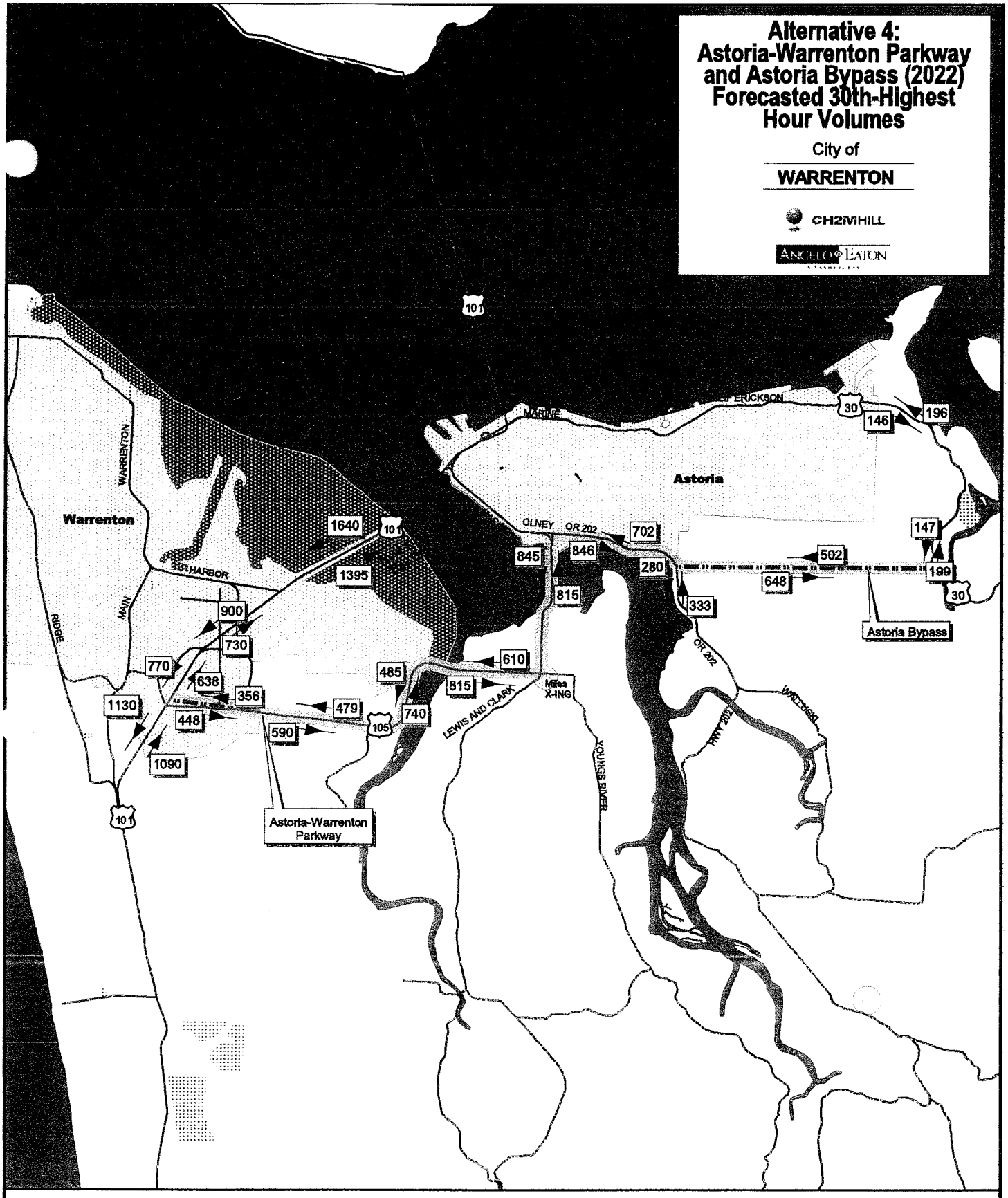
- **US 101 and SE Neptune Avenue**. Currently, this intersection is signalized and would operate close to OHP mobility standards under future, forecasted, Alternative 4, 30th-highest-hour conditions. The intersection would operate at a v/c ratio of 0.78 with no additional improvements under Alternative 4.

- **US 101 and East Harbor Drive**. Currently, this intersection is signalized and does not meet OHP mobility standards under existing or future, forecasted, no-build, 30th-highest-hour conditions. Although this intersection would serve less traffic with construction of the Astoria-Warrenton Parkway, the intersection still would not meet

OHP mobility standards without the addition of through lanes on US 101 and an additional eastbound left-turn lane on East Harbor Drive.

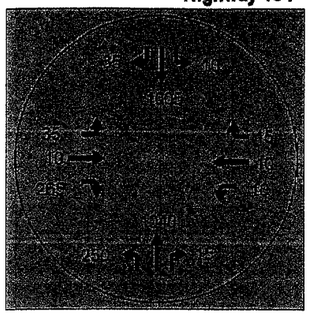


File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:26, User: JGATES2, Figure 4-4 - Alternative 4; Weekday PM Volumes

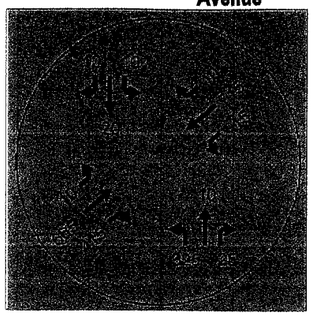


File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:26, User: JGATES2, Figure 4-5 - Alternative 4; 30th-Highest Hour Volumes

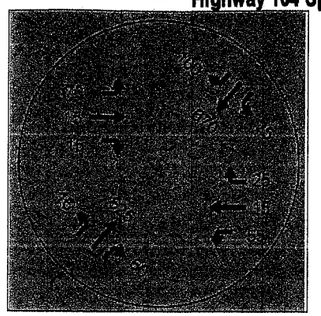
1 US 101 & Fort Stevens Highway 104



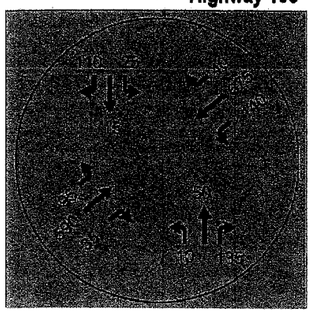
2 US 101 & Dolphin Avenue



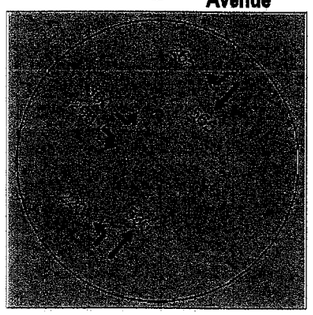
3 US 101 & Fort Stevens Highway 104 Spur



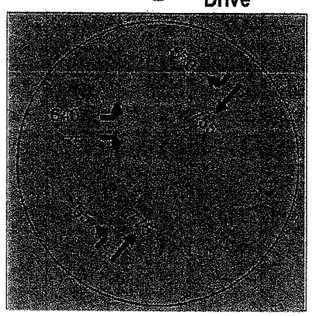
4 US 101 & Warrenton-Astoria Highway 105



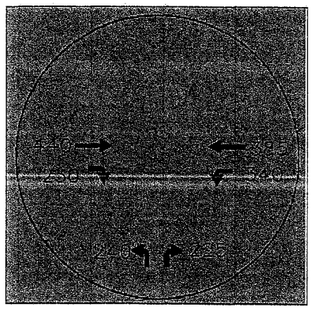
5 US 101 & Neptune Avenue



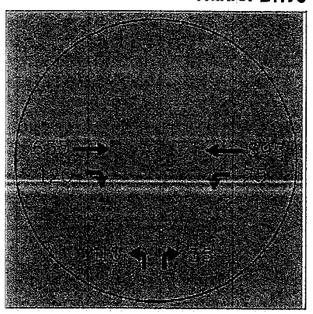
6 US 101 & Harbor Drive



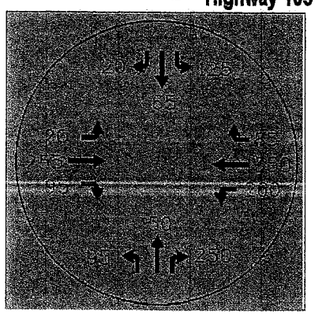
7 Harbor Drive & Neptune Avenue



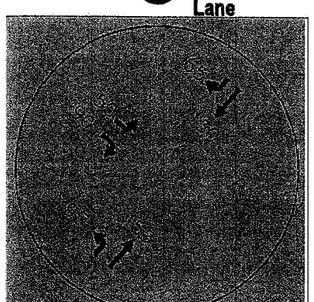
8 Warrenton-Astoria Highway 105 & Harbor Drive



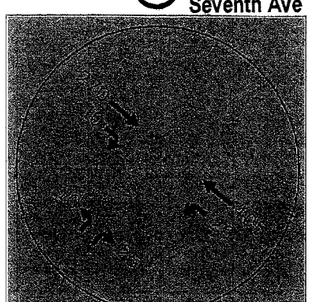
9 Fort Stevens Highway 104 & Warrenton-Astoria Highway 105



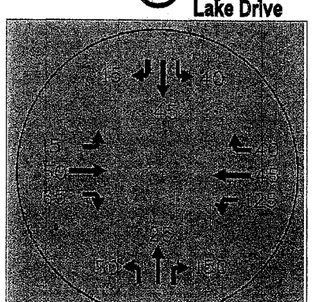
10 Fort Stevens Highway 104 & Delaura Beach Lane



11 Fort Stevens Highway 104 & Seventh Ave



12 Fort Stevens Highway 104 & Lake Drive



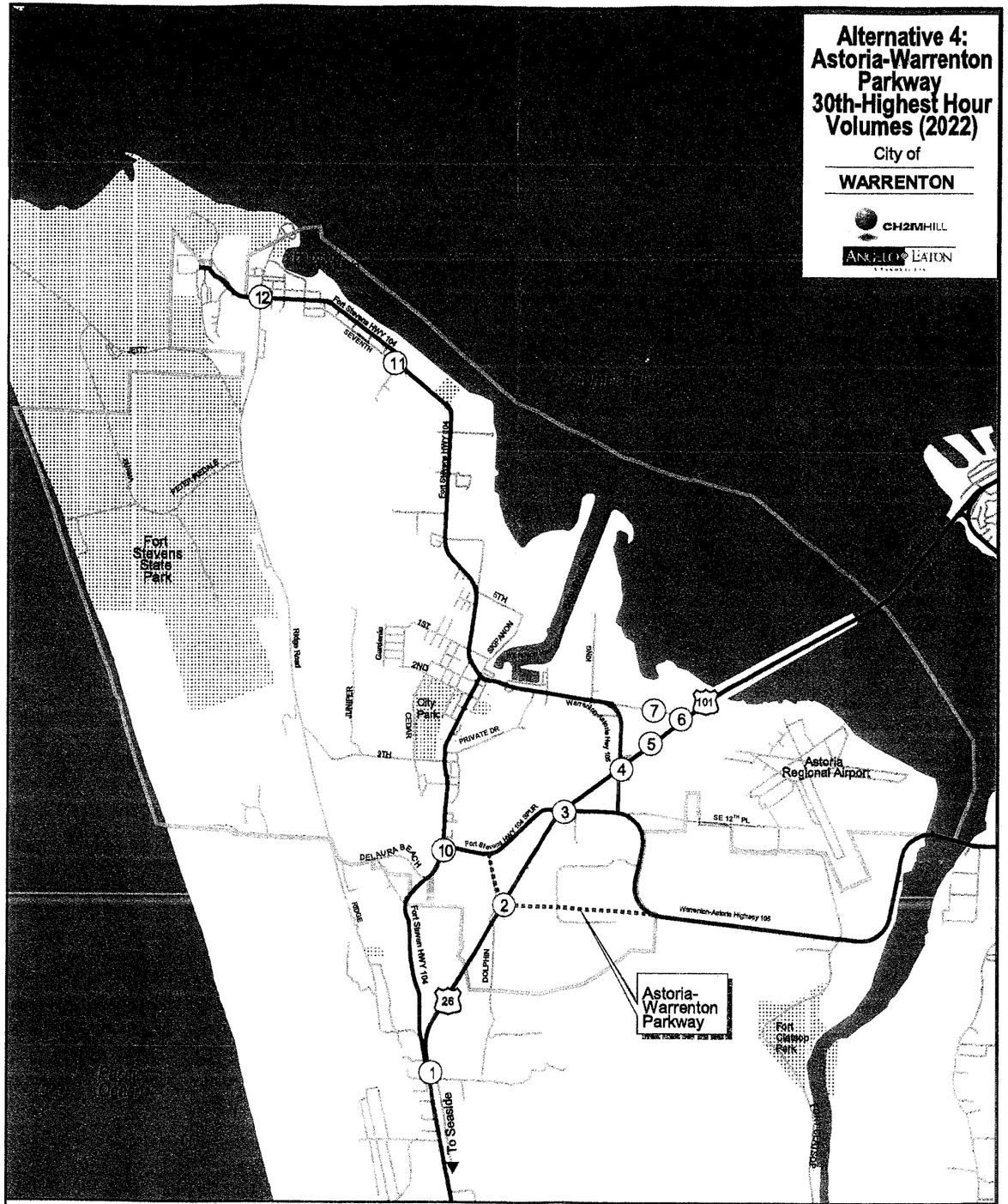


Figure 4-6
Transportation System Plan
Warrenton, OR

File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:26, User: JGATES2, Figure 4-6 - Alternative 4; Parkway 30th-Highest Hour Volumes

New Youngs Bay Bridge. As discussed in the alternative analysis for the Clatsop County TSP, the New Youngs Bay Bridge currently operates over capacity during 30th-highest-hour conditions. With construction of the Astoria-Warrenton Parkway, a significant shift in traffic would occur from the New Youngs Bay Bridge to the Old Youngs Bay Bridge. However, the bridge still would serve 2,840 vehicles per hour under 30th-highest-hour conditions. This results in a v/c ratio of 1.11 (both directions) using a capacity of 1,283 vehicles per hour (see Clatsop County TSP analysis methodology). Therefore, the bridge would need to be upgraded to a four-lane section to meet OHP mobility standards. If the New Youngs Bay Bridge is not widened to a four-lane section, the bridge will act as a "bottleneck" during 30th-highest-hour conditions. As a two-lane section, the bridge will operate at capacity (v/c ratio of 1.0), which will result in queuing and high delay times for drivers on the bridge.

- **East Harbor Drive and SE Neptune Avenue.** The analysis of Alternative 4 assumes that this intersection would continue to serve the same volumes, regardless of whether the Astoria-Warrenton Parkway is constructed. Therefore, as discussed under Alternative 3, this intersection would need to be signalized and the westbound left-turn lane would need to be increased to at least 250 feet to meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions.

- **East Harbor Drive and SE Marlin Avenue (Warrenton-Astoria Highway 105).** The analysis of Alternative 4 assumes that this intersection would continue to serve the same volumes, regardless of whether the Astoria-Warrenton Parkway is constructed. By adding a signal and westbound left-turn lane at this intersection, the intersection would meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions.

- **Astoria-Warrenton Parkway Alignment.** This analysis assumes that under year 2022, forecasted, 30th-highest-hour volumes, all segments of road along the bypass route would be designed to meet OHP mobility standards.

Alternative 4—Weekday Peak-Hour Analysis Summary

To eliminate future, forecasted, operational deficiencies under weekday peak-hour conditions, capacity improvements would be required in the following locations with construction of Alternative 4:

- Improvements associated with the Astoria-Warrenton Parkway, including a new section of road between US 30 and OR 202, improvements along OR 202, improvements along Warrenton-Astoria Highway 105, and a new section of roadway between Warrenton-Astoria Highway 105 and US 101

- Interchange at the realigned SE Dolphin Avenue, Astoria-Warrenton Parkway, and US 101 intersection

- Additional through lanes on US 101 or left-turn lane on East Harbor Drive at the intersection of East Harbor Drive and US 101

- Widen the New Youngs Bay Bridge to a four-lane section

- Signalization of the East Harbor Drive at SE Neptune Avenue intersection

Alternative 4 with a future, forecasted, weekday, peak-hour, design hour would require significantly less capacity improvements when compared with the 30th-highest-hour design hour. However, the New Youngs Bay Bridge still would need to be widened to a four-lane section to meet OHP mobility standards. Alternative 4 will address the implications of constructing the Astoria-Warrenton Parkway under future, forecasted, weekday, peak-hour conditions without widening the New Youngs Bay Bridge.

Alternative 4—Weekday Peak-Hour Analysis Methodology

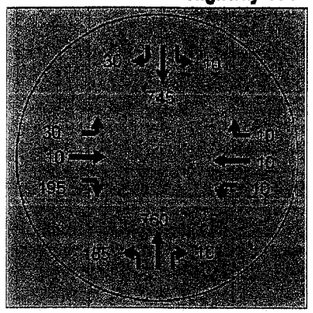
As noted under the 30th-highest-hour analysis methodology section, a significant shift in traffic volumes is expected on the west end of the Astoria-Warrenton Parkway project limits. In year 2016, a shift of 400 vehicles (both directions) is expected to occur from the New Youngs Bay Bridge to the Old Youngs Bay Bridge during forecasted, weekday, peak-hour conditions. In 2022, a shift of approximately 460 vehicles (both directions) would be expected during weekday, peak-hour conditions, which is 17 percent of the Astoria-Warrenton Parkway model 2022 weekday, peak-hour, no-build volume over the New Youngs Bay Bridge.

Using this same percentage with the no-build 2022 volumes developed for the Warrenton TSP, there would be a shift of 430 vehicles from the New Youngs Bay Bridge to the Old Youngs Bay Bridge under weekday, peak-hour conditions. This shift in traffic will create noticeable changes in traffic volumes along US 101 in Warrenton. Assuming a directional split of 55 percent southbound and 45 percent northbound, this would result in a shift of 235 vehicles southbound and 195 vehicles northbound from the New Youngs Bay Bridge to the Old Youngs Bay Bridge. The no-build, weekday, peak-hour 2022 volumes along US 101 between the East Harbor Drive and SE Dolphin Avenue that were developed for the Warrenton TSP were adjusted by 430 vehicles (235 southbound and 195 northbound) to analyze Alternative 4 under forecasted, weekday, peak-hour conditions. The volumes at the Fort Stevens Highway 104 and US 101 intersection also were adjusted to match the volumes forecasted in the Astoria-Warrenton Parkway study under weekday, peak-hour conditions. Figure 4-7 displays the adjusted 2022, weekday, peak-hour volumes for the Astoria-Warrenton Parkway.

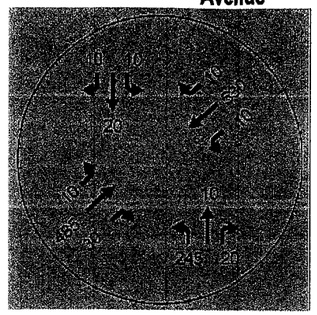
Using Synchro and the volumes in Figure 4-7, Alternative 4 was analyzed under weekday, peak-hour conditions. The following improvements would be necessary for the transportation system to meet OHP mobility standards under future, forecasted, weekday, peak-hour conditions:

- **US 101 and SE Dolphin Avenue**. Under future, forecasted, weekday, peak-hour conditions for Alternative 4, significant improvements would be required at this intersection because the Astoria-Warrenton Parkway would intersect US 101 at this location. ODOT's Preliminary Design Unit has developed a concept for an interchange just north of this location. The SE Dolphin Avenue approach north of US 101 would be realigned with US 101 at the interchange location. Additional lanes on US 101 would be required to accommodate the heavy northbound right-turn and westbound left-turn movements. (Note: Realignment of this intersection is required in the Warrenton Land & Investment Zone Change, 2000).

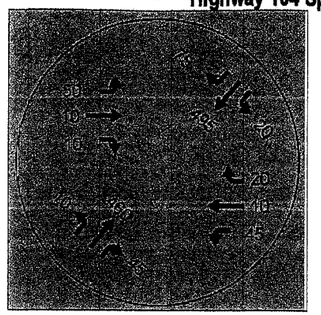
1 US 101 & Fort Stevens Highway 104



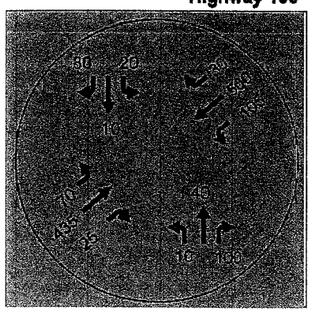
2 US 101 & Dolphin Avenue



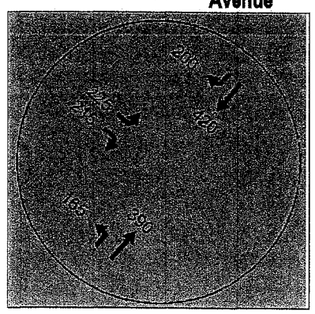
3 US 101 & Fort Stevens Highway 104 Spur



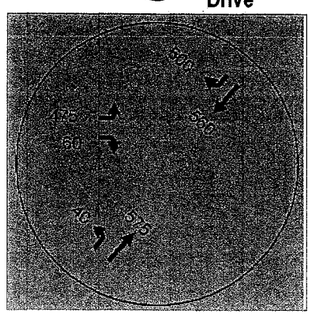
4 US 101 & Warrenton-Astoria Highway 105



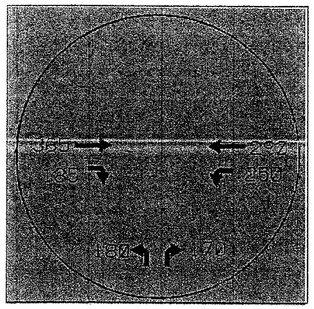
5 US 101 & Neptune Avenue

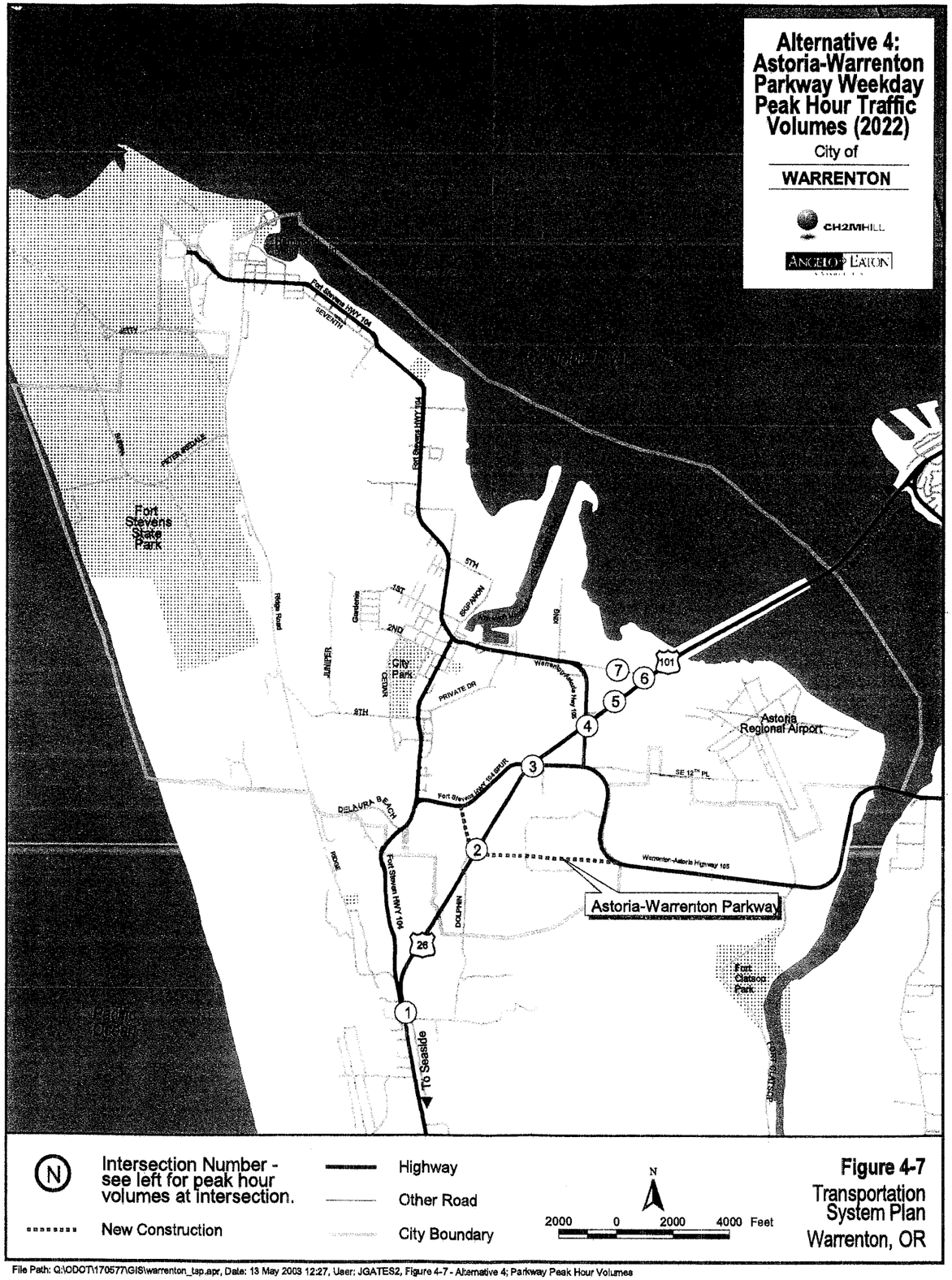


6 US 101 & Harbor Drive



7 Harbor Drive & Neptune Avenue





File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 13 May 2003 12:27, User: JGATES2, Figure 4-7 - Alternative 4; Parkway Peak Hour Volumes

- **US 101 and Fort Stevens Highway 104 Spur.** With construction of the Astoria-Warrenton Parkway, this intersection would meet OHP mobility standards under future conditions without any modifications because of the significant shift of traffic from US 101 to the parkway alignment.
- **US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105).** Under the proposed project for this intersection, a left-turn lane and shared through/right-turn lane will be constructed on each SE Marlin Avenue approach to US 101. On US 101, there will be a three-lane section, with left-turn lanes on each approach and a shared through/right-turn lane. Under future, forecasted, weekday, peak-hour conditions with the Astoria-Warrenton Parkway, this intersection configuration would meet OHP mobility standards.
- **US 101 and SE Neptune Avenue.** Under future, forecasted, weekday, peak-hour conditions with construction of the Astoria-Warrenton Parkway, this intersection would meet OHP mobility standards without modifications.
- **US 101 and East Harbor Drive.** This intersection is currently signalized and does not meet OHP mobility standards under existing or future, forecasted conditions. Although this intersection would serve less traffic with construction of the Astoria-Warrenton Parkway, the intersection still would not meet OHP mobility standards without the addition of through lanes on US 101 or an eastbound additional left-turn lane on Harbor Street.
- **New Youngs Bay Bridge.** As discussed in the alternative analysis for the Clatsop County TSP, the New Youngs Bay Bridge currently operates over capacity during 30th-highest-hour conditions. With construction of the Astoria-Warrenton Parkway, a significant shift in traffic would occur from the New Youngs Bay Bridge to the Old Youngs Bay Bridge. However, the bridge still would serve 2,240 vehicles per hour using future, forecasted, weekday, peak-hour volumes from the Astoria-Warrenton Parkway study. This results in a v/c ratio of 0.87 (both directions) using a capacity of 1,283 vehicles per hour (see Clatsop County TSP analysis methodology). Using the volumes shown on Figure 4-7, the New Youngs Bay Bridge would serve 2,110 vehicles per hour under future, forecasted, weekday, peak-hour conditions, which results in a v/c ratio of 0.82. Both of these scenarios do not meet OHP mobility standards, but are under a v/c ratio of 1.0. To meet OHP mobility standards, the New Youngs Bay Bridge would need to be widened to a four-lane section.
- **East Harbor Drive and SE Neptune Drive.** The analysis of Alternative 4 assumes that this intersection would continue to serve the same volumes, regardless of whether the Astoria-Warrenton Parkway is constructed. To meet OHP mobility standards under future, forecasted, weekday, peak-hour volumes, this intersection would need to be signalized.

Additional Projects

In addition to the capacity improvements above, additional projects were identified for Alternative 4 that would improve traffic circulation in Warrenton. These projects are shown in Figure 4-3:

- **Realignment of the Warrenton-Astoria Highway 105 intersections.** With construction of the Astoria-Warrenton Parkway alignment, T-intersections could be constructed at the intersections of Warrenton-Astoria Highway 105 with the parkway alignment and Airport Lane. The southern intersection improvement would be necessary for the parkway to function smoothly. The northern intersection improvement would improve access to the Astoria Regional Airport and address the existing intersection geometry issues.

- **SE King Avenue Extension.** A traffic impact study was completed in February 2001 for the proposed rezoning of the Skipanon Peninsula to allow for construction of a golf course north of East Harbor Drive near SE King Avenue. A golf course in this location would increase tourist traffic on US 101 and East Harbor Drive, because it would be a tourist destination during the summer months. The SE King Road extension could be used by traffic entering the golf course from the south or exiting the golf course and heading south through a grade-separated overpass at US 101 and a connection with the Astoria-Warrenton Parkway. Traffic heading north from the golf course or entering the golf course from the north would continue to use East Harbor Drive.

  Extending King Road over US 101 to the Astoria-Warrenton Parkway would also provide a connection between the commercial area (Fred Meyer, Costco) and the Astoria-Warrenton Parkway/Astoria Regional Airport. This would allow Astoria residents living near the Astoria-Warrenton Parkway alignment to avoid an at-grade crossing of US 101 and the New Youngs Bay Bridge by using the parkway and the SE King Avenue extension to access the commercial area. This improvement also would provide a direct connection between Warrenton and the airport.

Alternative 5: Non-Seasonal, Peak-Hour Capacity Improvements

Alternative 5 is a policy-driven alternative that was developed to determine which combination of improvements from Alternatives 2 through 4 would improve operations in Warrenton under future, forecasted, non-seasonal, peak-hour conditions without construction of a four-lane New Youngs Bay Bridge or related improvements at the intersection of US 101 with East Harbor Drive. This alternative assumes construction of the Astoria-Warrenton Parkway and Astoria Bypass improvement projects.

Under Alternative 5, the mainline segment of US 101 north of East Harbor Drive and the intersection of East Harbor Drive with US 101 would be congested during future, forecasted, weekday, peak-hour conditions and would not meet OHP mobility standards. Outside of the deficiencies identified at these locations, this alternative would meet OHP mobility standards under future, forecasted, weekday, peak-hour conditions. Alternative 5 would result in no new signals along US 101 within the City limits of Warrenton.

Alternative 5—Non-Seasonal, Peak-Hour Summary

Alternative 5 assumes the following capacity improvements:

- Improvements associated with the Astoria-Warrenton Parkway, including a new section of road between US 30 and OR 202, improvements along OR 202, improvements along Warrenton-Astoria Highway 105, and a new section of roadway between Warrenton-Astoria Highway 105 and US 101

- Interchange at the realigned SE Dolphin Avenue, Astoria-Warrenton Parkway, and US 101 intersection
- Signalization of the East Harbor Drive at SE Neptune Avenue intersection

Alternative 5 assumes that capacity improvements at the intersection of US 101 and East Harbor Drive and on the New Youngs Bay Bridge would not be constructed.

Measures of Effectiveness

The measures of effectiveness show that Alternative 5 would meet the mobility, coordination, and lifeline route goals of the Clatsop County TSP. The alternative also would improve capacity along State facilities. However, the alternative would have significant environmental and economic impacts.

Mobility/ Accessibility	Coordination	Non-Motorized Users	Transportation Funding	Environment	Capacity	Safety	Lifeline Routes
+	+	+	0	-	+	0	+

The advantages of Alternative 5 are:

- Three signals along US 101 within the City limits of Warrenton
- Improves existing lifeline routes and adds new lifeline routes to the network
- With the exception of the intersection of US 101 and East Harbor Drive and US 101 north of this intersection, the transportation system would function well under future, forecasted, weekday, peak-hour conditions.
- Minor improvements along the SE Marlin Avenue (Warrenton-Astoria Highway 105) approaches to US 101 would allow the system south of the US 101 and East Harbor Drive intersection to meet OHP mobility standards under future, forecasted, 30th-highest-hour conditions.

The disadvantages of Alternative 5 are:

- High construction costs as a result of the Astoria Bypass and Astoria-Warrenton Parkway improvements
- High environmental impacts as a result of construction of the Astoria Bypass and Astoria-Warrenton Parkway
- The entire transportation system in Warrenton would not meet OHP mobility standards under forecasted, 30th-highest-hour or weekday, peak-hour conditions.

Alternative 5—Non-Seasonal, Peak-Hour Analysis Methodology

The analysis results of Alternative 5 are the same as the results of Alternative 4 under weekday, peak-hour conditions at all locations except for the intersection of US 101 and East Harbor Drive and on the New Youngs Bay Bridge:

- **New Youngs Bay Bridge.** As discussed in the alternative analysis memorandum for the Clatsop County TSP, the New Youngs Bay Bridge currently operates at more than capacity during 30th-highest-hour conditions. With construction of the Astoria-Warrenton Parkway, a significant shift in traffic would occur from the New Youngs Bay Bridge to the Old Youngs Bay Bridge. However, the bridge still would serve 2,240 vehicles per hour using future, forecasted, weekday, peak-hour volumes from the Astoria-Warrenton Parkway study. This results in a v/c ratio of 0.87 (both directions) using a capacity of 1,283 vehicles per hour (see Clatsop County TSP analysis methodology). Using the volumes shown in Figure 4-7, the New Youngs Bay Bridge would serve 2,110 vehicles per hour under future, forecasted, weekday, peak-hour conditions, which results in a v/c ratio of 0.82 (both directions). Both of these scenarios do not meet OHP mobility standards, but are under a v/c ratio of 1.0. A v/c ratio of 1.0 indicates that a facility is operating at capacity. With a v/c ratio of less than 1.0, Alternative 5 assumes that the New Youngs Bay Bridge would operate at less than capacity during future, forecasted, weekday, peak-hour conditions.
- **US 101 and East Harbor Drive.** This intersection is currently signalized and does not meet OHP mobility standards under existing or future, forecasted, no-build conditions. With construction of the Astoria-Warrenton Parkway, traffic would be diverted from this intersection to the parkway alignment. Under Alternative 5 future, forecasted, weekday, peak-hour conditions, this intersection would operate at a v/c ratio of 0.82 without capacity improvements. This v/c ratio is more than OHP mobility standards, but less than a v/c ratio of 1.0.

Summary of Alternatives

Table 4-2 summarizes the range of improvements in Warrenton that would be required under each of the alternatives included in the analysis. A summary for Alternatives 3 and 4 was provided for both 30th-highest-hour and weekday, peak-hour conditions. Table 4-2 summarizes the design hour, the v/c ratio forecasted on the New Youngs Bay Bridge, the number of signals required on US 101, the improvements required on US 101 and East Harbor Drive, the relative environmental impacts and cost ($), safety improvements, and impacts to lifeline routes.

TSM and TDM Strategies

TSM and TDM measures could be implemented with any of the system alternatives described above.

TABLE 4-2
Summary of Alternatives

	Alternative 2: TSM Baseline Improvements	Alternative 3: Major Capacity Improvements on US 101	Alternative 3: Major Capacity Improvements on US 101	Alternative 4: Astoria-Warrenton Parkway	Alternative 4: Astoria-Warrenton Parkway	Alternative 5: Astoria-Warrenton Parkway
Design Hour	30th Highest Hour	30th Highest Hour	Weekday, Peak-Hour	30th Highest Hour	Weekday, Peak-Hour	Weekday, Peak-Hour
Meets OHP Mobility Standard	No	Yes	Yes	Yes	Yes	No
V/C Ratio on New Youngs Bay Bridge[1]	2-Lane: 1.51	4-Lane: 0.59 2-Lane: 1.51	4-Lane: 0.44 2-Lane: 1.12	4-Lane: 0.46 2-Lane: 1.18	4-Lane: 0.34 2-Lane: 0.87	2-Lane: 0.87
Number of Signals on US 101	3	5	3	3	3	3
US 101 Improvements	None	Four lanes along US 101 through Warrenton Four-lane New Youngs Bay Bridge	Spot widening along US 101 Four-lane New Youngs Bay Bridge	US 101 approach improvements (Marlin Drive, Harbor Street) Improvements at intersection of US 101 and Harbor Street Interchange at Dolphin Road Four-lane New Youngs Bay Bridge Four-lane section on US 101 between the New Youngs Bay Bridge and Harbor Street	Improvements at intersection of US 101 and Harbor Street (Additional through lanes on US 101 or east-bound left turn lane) Interchange at Dolphin Road Four-lane New Youngs Bay Bridge King Road Extension or Marlin Road Overpass	Interchange at Dolphin Road King Road Extension or Marlin Road Overpass
Harbor Street Improvements	None	Eastbound left-turn lane at US 101 Signals at Neptune Drive and Marlin Drive	Eastbound left-turn lane at US 101 Signals at Neptune Drive and Marlin Drive	Eastbound left-turn lane at US 101. Signals at Neptune Drive and Marlin Drive Westbound left turn lane at Marlin Drive	Eastbound left-turn lane at US 101 Signals at Neptune Drive and Marlin Drive Westbound left turn lane at Marlin Drive	Signals at Neptune Drive and Marlin Drive
Relative Environmental Impacts/Cost ($)	Low	High	Moderate	High	High[2]	Moderate
Safety Improvements	Included	Included	Included	Included	Included	Included
Local Street Improvements	Includes safety, capacity, widening, pedestrian, and bicycle projects throughout local Warrenton and Hammond	Not Included	Not Included	Not Included	Not Included	Not Included
Lifeline Routes	No change	Improves	Improves	Improves and creates new routes	Improves and creates new routes	Creates new routes

[1] V/C results reported for both directions on the New Youngs Bay Bridge (See Clatsop County TSP).

[2] Note: The environmental and economic impacts of this alternative would be high due to a four-lane New Youngs Bay Bridge and the improvements associated with the Astoria-Warrenton Parkway. However, they would be less significant than the impacts of Alternative 4 analyzed under future forecasted 30th highest hour conditions.

Potential TSM Solutions

Within each of the alternatives, the addition of turn bays at intersections, turn prohibitions, channelization improvements, and access management would be recommended through the implementation of baseline projects. All of these solutions are considered to be TSM measures, which maximize use of the existing transportation system through low cost improvements.

Another TSM solution to reroute local traffic traveling between Astoria and Warrenton to the Astoria-Warrenton Parkway alignment should be considered for Alternatives 4 and 5. A more direct connection over US 101 between the Warrenton shopping center area and the Astoria-Warrenton Parkway alignment could be included (e.g. King Road Overpass/ Extension or Marlin Drive Overpass).

Potential TDM Solutions

Within each of the alternatives, expansion of existing public transit services is recommended to reduce single-occupancy vehicle traffic. Access management projects on state and local roads are also included within this section. Both of these solutions are considered to be TDM measures.

In addition to this solution, ITS solutions could be considered to reduce traffic volumes and congestion on the New Youngs Bay Bridge. For the New Youngs Bay Bridge to operate at OHP mobility standards (v/c ratio of 0.75) during future, forecasted, weekday, peak-hour conditions, an additional 320 vehicles (250 southbound and 70 northbound) would need to shift from the New Youngs Bay Bridge to the Astoria-Warrenton Parkway alignment. This represents less than 15 percent of the total future, forecasted, no-build, weekday, peak-hour traffic volumes using the bridge. The Astoria-Warrenton Parkway alignment would have sufficient capacity to handle this additional traffic, as upgrades to the bridges and existing roadway sections would significantly improve operations along the alignment. However, drivers would not make this shift unless their total travel time or travel cost was reduced. Potential improvements that might induce more traffic to the Astoria-Warrenton Parkway alignment include:

- ITS solutions, including variable message signs to divert traffic during peak periods, might provide a mechanism to shift traffic from the New Youngs Bay Bridge to the Astoria-Warrenton Parkway alignment.
- Use of spot-based congestion pricing on the New Youngs Bay Bridge. Congestion or variable pricing implies that the fee imposed to use the bridge would vary depending on the demand for use (that is, the fee to use the bridge during peak periods would be higher than during non-peak times). During uncongested times, there could be no fee.

Zoning changes within Warrenton could also be considered as a TDM measure.

Other Potential Projects

This section describes potential projects that were identified but not included in the analysis of alternatives. Several of the potential projects were included in a transportation planning study of US 101 from Camp Rilea Road to the New Youngs Bay Bridge that was completed

in 1993. The study was prepared to determine which transportation improvements would be necessary to accommodate forecasted 2020 traffic volumes. The study looked at three scenarios, including a no-build alternative and two build alternatives. The study assumed that US 101 would be widened to a four-lane section and turn lanes would be added to all intersections along US 101 to accommodate future growth. In addition to widening US 101 and improving intersections, the following potential projects were included in the two build alternatives:

- **East Harbor Drive Grade-Separated Ramp**. A grade-separated ramp at East Harbor Drive was included in both of the build alternatives in the planning study. A ramp in this location would improve traffic operations on US 101 and East Harbor Drive by eliminating a traffic signal. This improvement could be considered if US 101 and the New Youngs Bay Bridge are upgraded to four-lane sections. A ramp in this location would be constrained by Youngs Bay on the north and existing commercial structures to the west.

- **SE Marlin Avenue (Warrenton-Astoria Highway 105) Overcrossing**. Constructing an overcrossing at SE Marlin Avenue would provide a more direct connection between the airport area and the commercial area. This project would be similar to the SE King Avenue extension that was proposed in Alternatives 4 and 5. In the near future (summer 2004), SE Marlin Avenue will be improved as part of a STIP project. An overcrossing at SE Marlin Avenue was not included as an alternative because it would require additional construction at this location that would rebuild the intersection.

- **Frontage Roads Along US 101.** In the two build alternatives, frontage roads on both sides of US 101 were analyzed. Frontage roads along US 101 would provide access to commercial properties that will potentially be built in Warrenton in the next 20 years. Frontage roads would preserve the function of US 101 through access management and improve safety in the vicinity of development. The concept of frontage roads in Warrenton would need to be further studied in a refinement study, including access points to US 101 and locations.

- **Landscaped Medians on US 101.** Constructing landscaped medians in both of these locations would restrict turn movements as an access management treatment and enhance the appearance of the community by creating a boulevard effect. Landscaped medians at select locations on US 101 have been proposed by other studies.

- **Streetscape Improvements on East Harbor Drive and Fort Stevens Highway 104 in Hammond** would enhance the appearance of the community and create a boulevard effect. These improvements are recommended in the Warrenton Community Visioning Plan.

In addition to the planning study projects identified above, several other localized improvements were identified:

- **Realignment of the Fort Stevens Highway 104 and Seventh Avenue Intersection**. This intersection has a significant skew, with poor sight distance. The intersection currently serves low ADT volumes on the minor approach. If residential development creates higher than forecasted increases in traffic on Seventh Avenue, intersection improvements should be considered in this location.

- **Couplet in Downtown Warrenton on Fort Stevens Highway 104.** Between the intersection of Warrenton-Astoria Highway 105 with Fort Stevens Highway 104 and 4th Street to the south, a new section of roadway could be constructed parallel with Fort Stevens Highway 104 to create a one-way couplet in downtown Warrenton. A couplet in this location would enhance the downtown area of Warrenton, creating a better environment for pedestrians and bicycles. Construction of a couplet in this location would have major impacts to residential and commercial structures, because right-of-way would be acquired. Constraints for a one-way couplet include commercial structures along Fort Stevens Highway 104 and residential structures on adjacent streets, the Skipanon River to the east of Fort Stevens Highway 104, and the Community Center to the west of Fort Stevens Highway 104.
- **Couplet in Hammond Area on Fort Stevens Highway 104.** Between Heceta Street and Ridge Road, there is an existing parallel roadway to the north of Fort Stevens Highway 104 that could be used to create a one-way couplet with Fort Stevens Highway 104. To the east, Seventh Avenue could be used create a one-way couplet with Fort Stevens Highway 104. Construction of a one-way couplet in either of these locations would have impacts to existing residences and possibly to commercial structures.
- **Improvements at US 101 and Fort Stevens Highway 104 Spur Intersection.** This intersection has poor sight distance because of vertical grades on both sides of US 101. ODOT has developed a concept for this intersection that would limit turn movements to right-in/right-out turns only, with mountable islands for emergency use. These improvements most likely will be constructed as part of an ODOT STIP project that is scheduled for 2004 at the intersection of US 101 and SE Marlin Avenue.

Preferred Alternative

Two key transportation issues that affect the selection of a preferred alternative for the Warrenton TSP have been identified and discussed with the PMT and AC, including the selection of an appropriate design hour. As discussed in previous sections, Warrenton experiences significant increases in traffic as a result of tourism during the summer season on State and County roadway facilities. As measured at the Gearhart ATR in year 2000, 30th-highest-hour traffic volumes are approximately 35 percent higher than weekday, peak-hour volumes. To address fluctuations in traffic volumes resulting from tourism, alternatives were developed for the Warrenton TSP to eliminate future, forecasted, operational deficiencies during both the peak tourist season (30th-highest-hour) and the weekday, peak-hour.

In addition to the selection of an appropriate design hour, mobility standards for State facilities have been discussed with the PMT and AC. In Warrenton, capacity improvements can be constructed on US 101 to meet to meet OHP mobility standards under future, forecasted conditions. However, capacity improvements on the New Youngs Bay Bridge north of Warrenton are not likely within the 20-year horizon because of funding and environmental constraints. If the New Youngs Bay Bridge is not widened to a four-lane section, the bridge will continue to act as a capacity constraint on US 101. To address this issue, alternatives were developed to meet OHP mobility standards under future, forecasted conditions by widening the New Youngs Bay Bridge. In addition, an alternative that

includes a two-lane New Youngs Bay Bridge section and, therefore, does not meet OHP mobility standards was developed and presented to the PMT and AC.

Based on the analysis of each alternative, the measures of effectiveness, the TSP goals and objectives, and recommendations by the PMT and AC, a combination of Alternatives 2 and 4 is recommended as the preferred alternative for the Warrenton TSP. **See Figures 4-8 and 4-10 for all the improvements included in the preferred alternative.** The preferred alternative is aggressive: it includes the Astoria-Warrenton Parkway, the Astoria Bypass, and a four-lane New Youngs Bay Bridge to meet system demands during a 20-year period. The preferred alternative includes all of the baseline roadway, pedestrian, bicycle, transit, air, and water projects. An implementation strategy for the preferred alternative is presented in Section 5. This strategy takes into account prioritization of projects for improvements within Warrenton.

Capacity improvements on the New Youngs Bay Bridge will be difficult to fund in the 20-year planning horizon. However, the PMT and AC members believe it was important to include capacity improvements on the New Youngs Bay Bridge in the TSP if funding becomes available.

Major System Improvements

The preferred alternative for the Warrenton TSP proposes a number of significant improvements on the State Highway system within the vicinity of Warrenton, including:

- Astoria-Warrenton Parkway Improvements
- New Young's Bay Bridge Improvements
- Potential SE King Avenue Extension/SE Marlin Avenue Overpass
- Potential Frontage Roads along US 101
- Potential Airport Access Improvements

The improvements proposed in the preferred alternative for the Warrenton TSP are part of Clatsop County's overall TSP. In addition to the Astoria-Warrenton Parkway and capacity improvements on the New Young's Bay Bridge, the Clatsop County TSP proposes construction of the Astoria Bypass Project.

The Warrenton TSP clearly demonstrates how these improvements will need to be a part of the overall transportation system in the next twenty years to meet mobility and level of service standards. At the same time, the City of Warrenton recognizes that these improvements are significant both in terms of financial costs and potential environmental and land use impacts. The TSP has not defined specific alignments or improvement designs for these projects. The City understands that additional refinement work will be required to assess impacts, define design options and identify preferred alternatives. This refinement work will also need to assess land use impacts and describe how these particular projects comply with state land use planning goals. Ultimately these projects will need to provide findings demonstrating compliance with federal, state and local planning and resource goals through environmental assessments or impact statements.

Astoria-Warrenton Parkway Improvements

The Astoria-Warrenton Parkway project would begin at the intersection of OR 202 and Warrenton-Astoria Highway 105 in Astoria. The alignment of the Astoria-Warrenton Parkway would follow the existing Warrenton-Astoria Highway 105 alignment south across the Old Youngs Bay Bridge, and then continue west along Warrenton-Astoria Highway 105 past Fort Clatsop. Along this existing section of Warrenton-Astoria Highway 105, street improvements would be necessary, including sidewalks, bicycle improvements, access management projects, replacement of the Old Youngs Bay and Lewis and Clark Bridges, and the construction of turn lanes. As described in the Clatsop County TSP, a refinement study will need to be completed for the Miles Crossing/Jeffers Garden area. Figure 4-8 presents all the improvements associated with the Astoria-Warrenton Parkway and Figure 4-9 presents a preliminary concept for the cross-section of the Astoria-Warrenton Parkway. The alignments shown in the Warrenton TSP for the Astoria-Warrenton Parkway alignment and associated improvements are conceptual and not intended to represent the actual alignments. The actual alignments will need to be further refined.

Past Fort Clatsop, a new east-west section of roadway included in the Astoria-Warrenton Parkway project would link Warrenton-Astoria Highway 105 with US 101. The alignment of new roadway shown in the Warrenton TSP is preliminary and will need to be further refined.

With construction of the Astoria-Warrenton Parkway, a traffic signal or interchange would be constructed at the point of connection with US 101. ODOT's Preliminary Design Group has developed a preliminary concept for an interchange at the intersection of the Astoria-Warrenton Parkway, US 101, and the realigned approach of Dolphin Road. As part of an IGA between ODOT and the City of Warrenton, the Dolphin Road approach to US 101 will need to be realigned through future development on adjacent properties. The point of connection and interchange configuration developed by the Preliminary Design Group will need to be reevaluated and further refined.

In addition to the Astoria-Warrenton Parkway improvements described above, the following projects are recommended as part of the preferred alternative for the Warrenton TSP:

- **Realignment of the Warrenton-Astoria Highway 105 Intersections.** With construction of the Astoria-Warrenton Parkway alignment, T-intersections should be constructed at the intersections of Warrenton-Astoria Highway 105 with the parkway alignment and Airport Lane. The southern intersection improvement would be necessary for the parkway to function smoothly. The northern intersection improvement would improve access to the airport and address the existing intersection geometry issues.
- As part of the Astoria-Warrenton Parkway project, improvements to the existing airport access north of Fort Clatsop Road should be considered. An improved entrance from the Astoria-Warrenton Parkway would likely be used by traffic traveling from Astoria to the airport. This project should be further studied as part of the Miles Crossing/Jeffers Garden refinement study. This project should include improved signing from the airport alignment.

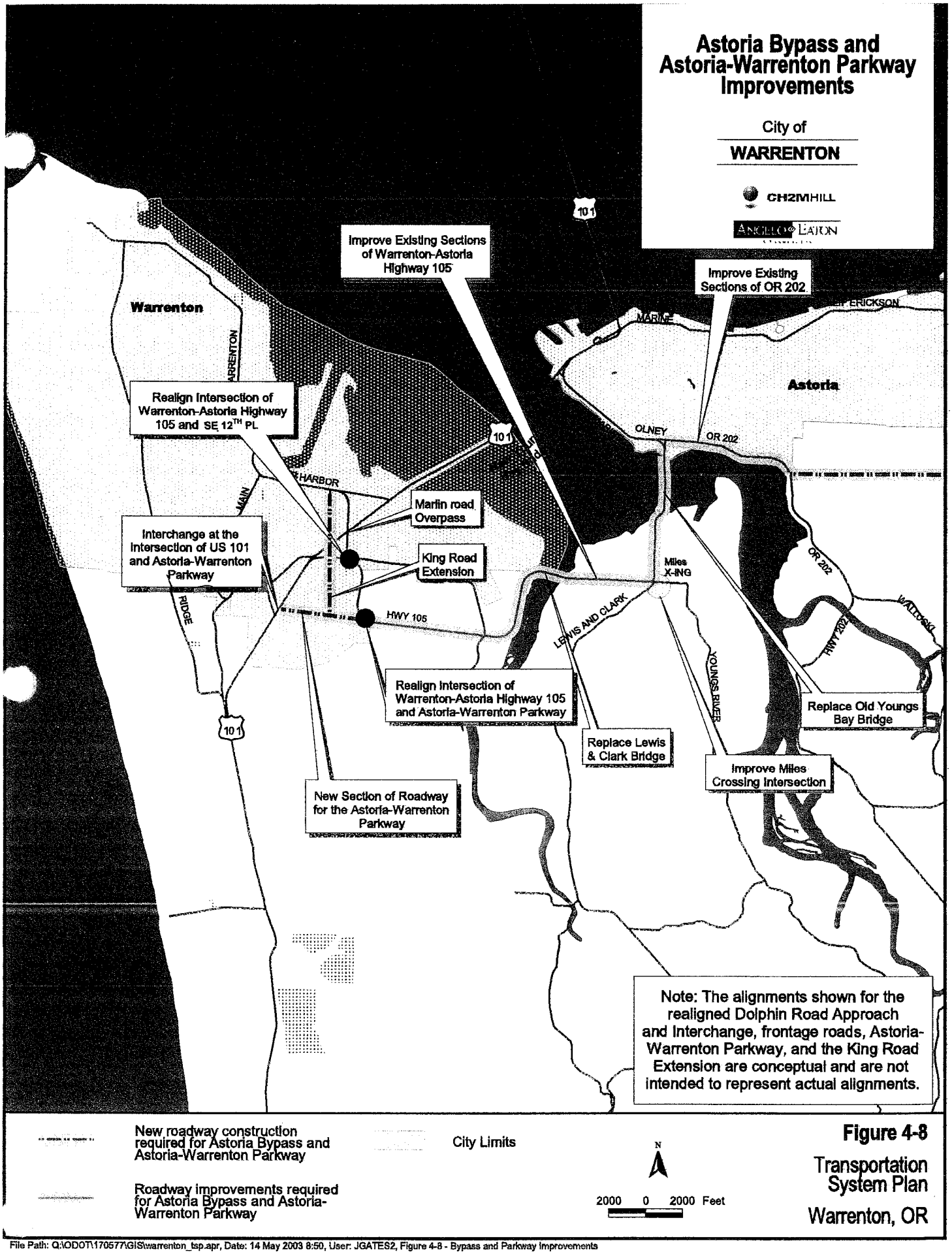
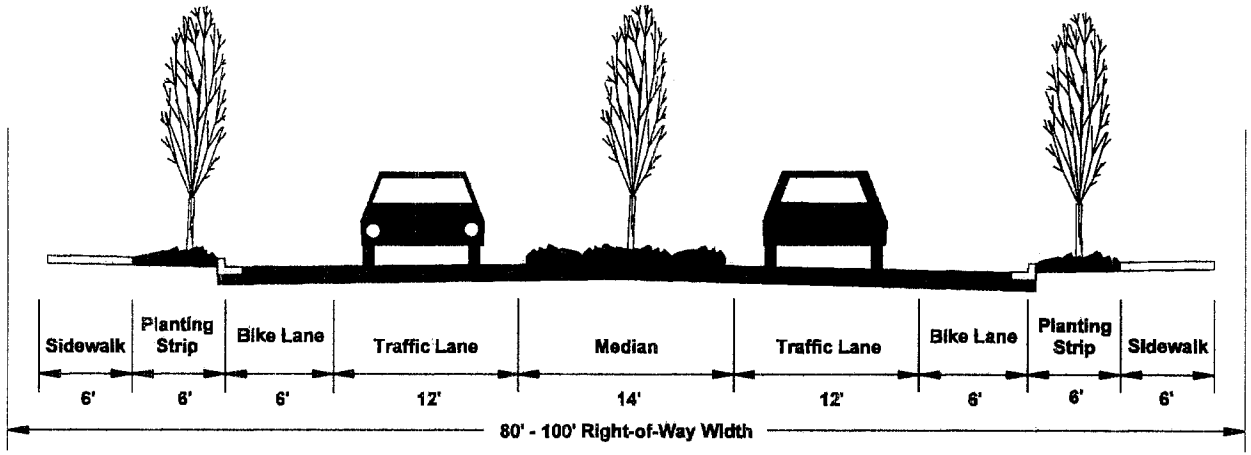
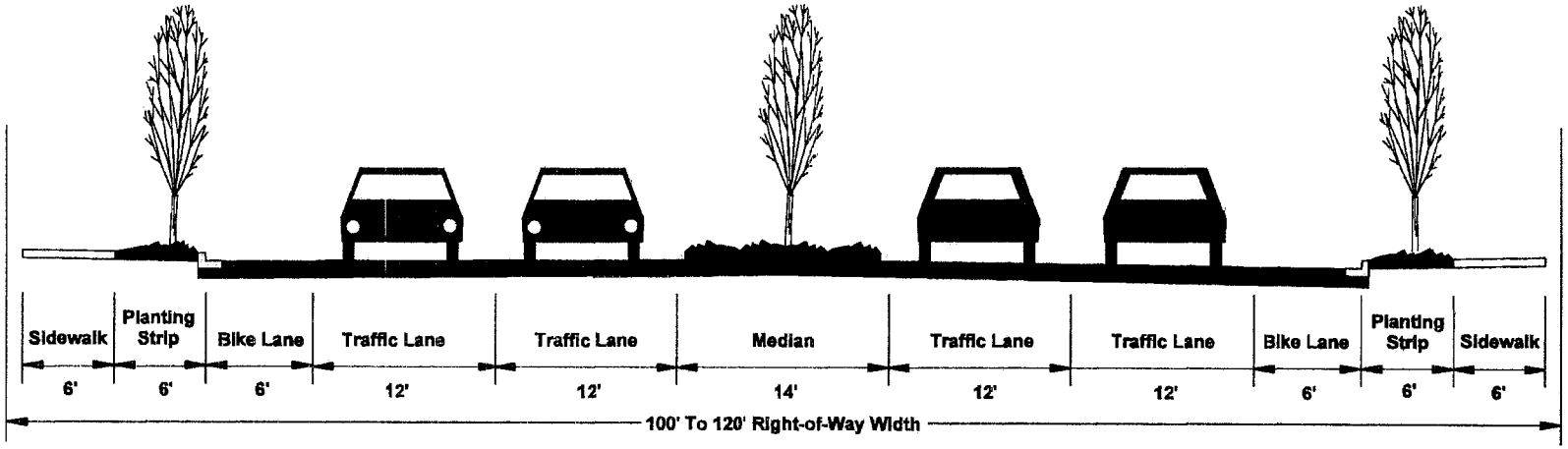


Figure 4-8
Transportation System Plan
Warrenton, OR

File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 14 May 2003 8:50, User: JGATES2, Figure 4-8 - Bypass and Parkway Improvements



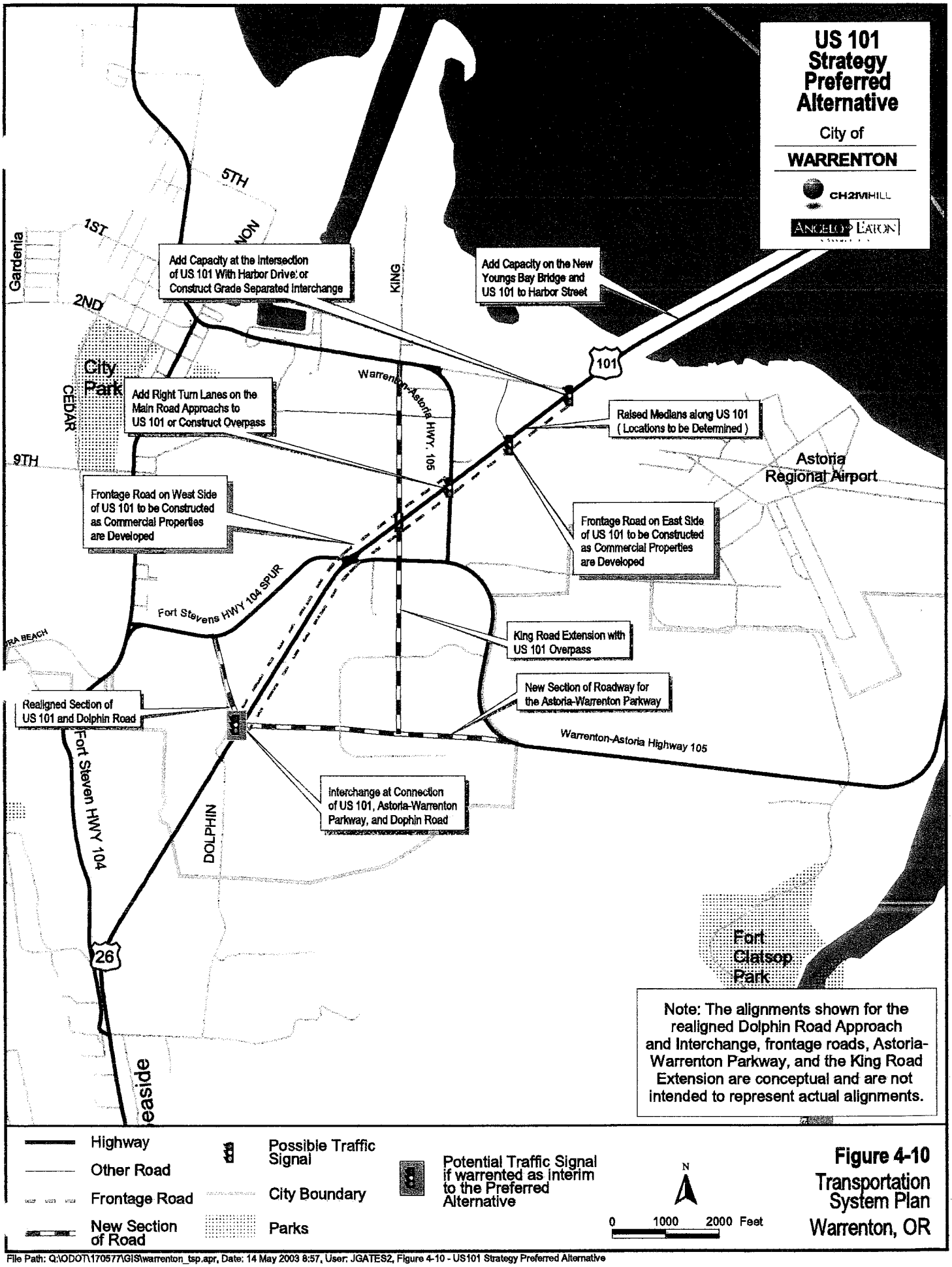
Astoria-Warrenton Parkway (2-Lane Facility)



Astoria-Warrenton Parkway (4-Lane Facility)

FIGURE 4-9

Preliminary Cross Sections - Astoria-Warrenton Parkway
Warrenton Transportation System Plan



File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 14 May 2003 8:57, User: JGATES2, Figure 4-10 - US101 Strategy Preferred Alternative

Potential SE King Road Extension / SE Marlin Avenue Overpass

To improve operations and circulation in Warrenton by providing a more direct route for local traffic traveling to the airport and commercial area, an overpass on US 101 is recommended. The overpass could be located over US 101 at an extension of SE King Avenue or SE Marlin Avenue (Warrenton-Astoria Highway 105). An overpass in one of these locations also would provide an alternate route to US 101 and East Harbor Drive and connect the Astoria-Warrenton Parkway with downtown Warrenton. An overpass in one of these locations would not provide access to US 101, as it would be intended to improve circulation between the east and west sides of US 101. This concept should be further studied in a refinement plan to determine the feasibility of constructing an overpass, including impacts to surrounding business owners and environmental/wetland impacts. In addition, impacts on traffic operations should be further investigated.

An overpass at the SE King Avenue extension or SE Marlin Avenue would likely be constructed concurrently with the Astoria-Warrenton Parkway improvements. Alternatives for the overpass location should be developed and evaluated as the design of the Astoria-Warrenton Parkway is refined. The SE King Avenue extension would function well with the proposed golf course on the Skipanon Peninsula and commercial/residential development that is planned along SE King Avenue. To construct an overpass at SE Marlin Avenue, there would be significant impacts to existing businesses.

See Figure 4-10 for a conceptual graphic of the SE King Avenue Extension and SE Marlin Avenue Overpass. The alignment shown in the Warrenton TSP for the SE King Avenue Extension is conceptual and not intended to represent the actual alignment, which will need to be further refined.

US 101 Strategy

Figure 4-10 presents the improvements that are recommended for US 101 within the City limits of Warrenton under the preferred alternative. The US 101 strategy is important because it addresses the primary transportation corridor that passes through Warrenton and because US 101 is the subject of an IGA signed by Warrenton and ODOT in January 2001. The IGA stipulated certain standards and conditions that Warrenton needed to consider during the preparation of the TSP. These conditions have been addressed and met with this TSP.

New Youngs Bay Bridge

Under the preferred alternative, capacity will be added to the New Youngs Bay Bridge (four-lane section). Additional planning studies will be necessary to determine the impacts of this project and the best alternative for additional capacity. Options that will likely be considered include construction of a parallel two-lane bridge, construction of a four-lane bridge, and construction of a floating bridge. Through all of these projects, there would be high environmental impacts and funding constraints. In addition, the recently constructed roundabout at Smith Point and the intersection of US 101 at East Harbor Drive would require improvements with construction of additional capacity on the New Youngs Bay Bridge. A project to add pedestrian and bicycle facilities is also included in the Warrenton TSP, as the bridge currently lacks shoulders.

US 101 and East Harbor Drive Intersection

The preferred alternative includes capacity improvements at the intersection of US 101 with East Harbor Drive that would be designed to operate with a four-lane New Youngs Bay Bridge Section. Under existing conditions, this intersection experiences the highest entering volume of all the study intersections in Warrenton because of high through volumes on US 101 and high left-turn volumes from East Harbor Drive onto US 101. Under the preferred alternative, traffic volumes traveling through this intersection would be reduced through construction of the Astoria-Warrenton Parkway. However, to meet OHP mobility standards, capacity improvements would be necessary at this intersection.

To add capacity to this intersection, several alternatives would need to be considered. Additional lanes at the intersection of US 101 and East Harbor Drive, including an additional eastbound left-turn lane, northbound through lane, and southbound through lane, are included in the preferred alternative.

As suggested in previous studies, a grade-separated interchange also could be considered at this intersection to eliminate a traffic signal on US 101. An interchange in this location would be constrained by Youngs Bay on the north and existing commercial structures to the west.

Capacity improvements at the intersection of US 101 and East Harbor Drive relate to capacity improvements on the New Youngs Bay Bridge. Without capacity improvements on the New Youngs Bay Bridge, US 101 will not operate under OHP mobility standards because the bridge will act as a "bottleneck." The New Youngs Bay bridge approach is located less than 1,200 feet from the intersection of US 101 with East Harbor Drive, which is a relatively short distance. To eliminate operational deficiencies on US 101, capacity improvements at the intersection of US 101 and East Harbor Drive and on the New Youngs Bay Bridge should be constructed within the same timeframe.

US 101 and SE Marlin Avenue Intersection

As discussed under the Astoria-Warrenton Parkway section, an overpass over US 101 at SE Marlin Avenue (Warrenton-Astoria Highway 105) or along a grade-separated extension of SE King Avenue should be considered. If an overpass is not constructed at SE Marlin Avenue and this intersection is to remain at-grade, additional improvements will be necessary at this intersection to meet OHP mobility standards. In year 2004, improvements will be constructed at the US 101 and SE Marlin Avenue intersection, including a traffic signal and realignment of the SE Marlin Avenue approaches. To meet OHP mobility standards under year 2022, forecasted, 30th-highest-hour conditions, additional right-turn lanes on the SE Marlin Avenue approaches will be necessary.

US 101 and Fort Stevens Highway 104 Spur Intersection

At the intersection of US 101 and Fort Stevens Highway 104 Spur, channelization improvements will be constructed in the next few years as part of an ODOT project to improve the US 101 at SE Marlin Avenue Intersection. A median will be constructed on the east Fort Stevens Highway 104 Spur approach to US 101, which will restrict westbound movements to right-out only. After construction of the project, through movements along Fort Stevens Highway 104 Spur in both directions across US 101 will not be allowed. In addition, left turn

movements from US 101 in the southbound direction onto Fort Stevens Highway 104 Spur will not be allowed. From the eastbound Fort Stevens Highway 104 Spur approach, left and right turns will continue to be allowed.

The ODOT project will improve safety and operations at the intersection of US 101 at Fort Stevens Highway 104 Spur. Therefore, the preferred alternative does not recommend additional improvements at this intersection. ODOT should continue to monitor the operational and safety performance at this intersection to determine if additional improvements are necessary over the 20-year planning horizon.

US 101 and SE Dolphin Avenue Intersection

Through an IGA signed in December of 2000 between ODOT and the City of Warrenton, the north SE Dolphin Avenue approach to US 101 will be realigned as part of future development on adjacent properties. The preferred alternative assumes that the Astoria-Warrenton Parkway will connect with US 101 at the realigned SE Dolphin Avenue approach connection with US 101. The alignments shown in the Warrenton TSP for the realigned SE Dolphin Avenue approach and point of connection with the Astoria-Warrenton Parkway are conceptual and not intended to represent the actual alignments. The actual alignments and point of connection will need to be further refined as part of an alternatives analysis and preliminary design.

The preferred alternative includes an interchange at US 101 at SE Dolphin Avenue as a part of the long range US 101 Improvement Strategy. Construction of an interchange at this location would occur in conjunction with the Astoria-Warrenton Parkway. Recognizing that this project is a long-range project, it may be necessary to provide an interim traffic signal at US 101 and SE Dolphin Avenue to address safety or capacity conditions until the Astoria-Warrenton Parkway is constructed. An interim traffic signal at this location would need to be coordinated with ODOT and meet traffic signal warrants. Prior to construction of an interchange, Warrenton and ODOT should take steps through the development review process, to insure that future development does not preclude the future construction of an interchange at this location and the opportunity to construct the Astoria-Warrenton Parkway.

Frontage Roads

Construction of frontage roads along US 101 is recommended as commercial properties are developed. Frontage roads would preserve the function of US 101 through access management and improve safety in the vicinity of development. The alignments shown in the Warrenton TSP for the frontage roads along US 101 are conceptual and not intended to represent the actual alignments. The concept of frontage roads in Warrenton should be further studied in a refinement plan, including feasible locations and access points to US 101. The frontage road refinement plan will need to address impacts to wetlands along US 101, which will determine feasible locations for frontage roads.

Airport Access Road

The Astoria Airport Master Plan completed in 1993 includes a concept for an improved access to the Astoria Regional Airport. The concept includes the addition of a fourth leg at the US 101 and SE Neptune Avenue intersection that would provide direct access to the

airport area. The concept shown in the Astoria Airport Master Plan would have significant impacts to wetlands (east of US 101) and to traffic operations for through traffic on US 101. This concept should be further studied as part of the frontage road refinement plan, including environmental impacts and feasibility of locating a fourth leg at SE Neptune Avenue or East Harbor Drive. Traffic operations associated with a fourth leg at one of these intersections should also be further studied as part of the frontage road refinement plan, including impacts of the project relative to OHP mobility standards and ODOT signal spacing standards.

The preferred alternative does not include additional access points along US 101 for the Astoria Regional Airport. However, other improvements included in the preferred alternative and committed improvements within Warrenton will improve access to the airport through construction of the Astoria-Warrenton Parkway (and associated improvements) and a signalized intersection at SE Marlin Avenue. A potential overpass at SE Marlin Avenue or as part of the SE King Avenue Extension project would provide a means for drivers to travel from downtown Warrenton, Hammond, or the commercial area across US 101 to the airport area without traveling through an at-grade crossing. In addition, intersection improvements at Warrenton-Astoria Highway 105 and SE 12th Place will improve access to the airport. An improved entrance from the Astoria-Warrenton Parkway to the airport north of Fort Clatsop Road should be further studied as part of the Miles Crossing/Jeffers Garden refinement study.

Warrenton Signing Strategy

As part of the Warrenton TSP, improvements to signing along US 101 are recommended. Under existing conditions, a sign directing travelers to Warrenton is located at the intersection of US 101 at Fort Stevens Highway 104. This sign can be confusing for visitors traveling northbound on US 101, as there are other intersections that lead into downtown Warrenton (i.e. US 101 at East Harbor Drive, US 101 at SE Marlin Avenue) and the commercial area. After construction of the preferred alternative, including the Astoria-Warrenton Parkway, the City of Warrenton and ODOT should determine the appropriate location for a gateway to Warrenton along US 101 in the northbound direction.

Coordination between ODOT and the City of Warrenton will be necessary to determine an appropriate signing strategy both as an interim to the preferred alternative (i.e. making minor modifications to existing signs) and in conjunction with the preferred alternative (i.e. determine the appropriate gateway to Warrenton).

Signalization on US 101

Within the City of Warrenton, there are five intersections along US 101. Under existing conditions, the intersections of US 101 with East Harbor Drive and SE Neptune Avenue are signalized. Within the next year, a signal will be constructed at the intersection of US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105). As part of the US 101 at SE Marlin Avenue Project, a median will be constructed at the intersection of US 101 and east Fort Stevens Highway 104 Spur, which will restrict some turn movements at this intersection. With construction of an interchange at the realigned intersection of Dolphin Road with US 101, the preferred alternative results in three signalized intersections along US 101 in Warrenton.

The TSP for the City of Warrenton recognizes that the preferred alternative is a long-range strategy that will take several years to implement. Therefore, an additional signal at the intersection of SE Dolphin Avenue and US 101 may be necessary as an interim phase to full implementation of the preferred alternative. An additional signal at this intersection as an interim phase to full implementation of the preferred alternative would need to be further studied as part of a refinement study. Additional signals would be dependant on ODOT signal spacing, access requirements, traffic signal warrants, and a potential expressway classification for US 101.

Under the preferred alternative, the number of signalized intersections in Warrenton along US 101 may be less than three depending on the improvements that are constructed at the intersections of US 101 with East Harbor Drive and SE Marlin Avenue (Warrenton-Astoria Highway 105). Construction of a grade-separated interchange at East Harbor Drive would eliminate a signal along US 101. Construction of an overpass at SE Marlin Avenue would also eliminate a signal along US 101.

Landscaped Medians on US 101

As suggested in previous studies, constructing landscaped medians along US 101 as an access management, safety, and aesthetic treatment should be considered. Potential locations for landscaped medians along US 101 should be identified in the frontage road refinement plan.

TSM/TDM Measures

As part of the preferred alternative, TSM/TDM measures are recommended to increase usage of the Astoria-Warrenton Parkway. Some measures that should be further studied include:

- ITS solutions, including variable message signs to divert traffic during peak periods, might provide a mechanism to shift traffic from the New Youngs Bay Bridge to the Astoria-Warrenton Parkway alignment.
- Use of spot-based congestion pricing on the New Youngs Bay Bridge. Congestion or variable pricing implies that the fee imposed to use the bridge would vary depending on the demand for use (that is, the fee to use the bridge during peak periods would be higher than during non-peak times). During uncongested times, there could be no fee.
- A more direct connection over US 101 between the Warrenton shopping center area and the Astoria-Warrenton Parkway alignment could be included (that is, SE King Avenue Overpass/Extension or SE Marlin Avenue Overpass).

Streetscape Improvements on East Harbor Drive and Fort Stevens Highway 104 (Hammond)

Constructing streetscape improvements, including landscaping and sidewalks, on East Harbor Drive and Fort Stevens Highway 104 in Hammond would enhance aesthetics in the community and create a boulevard effect. Streetscape improvements on East Harbor Drive (between US 101 and downtown Warrenton) and Fort Stevens Highway 104 in Hammond are recommended in the Warrenton Community Visioning Plan.

Project Phasing

The roadway improvement projects associated with the preferred alternative are significant and most likely would be implemented in phases as funding becomes available. In this section, recommendations are made regarding project phasing and prioritization.

To reduce congestion on the New Youngs Bay Bridge and along US 101 in Warrenton, the Astoria-Warrenton Parkway improvements should be constructed before other capacity improvements along US 101. As discussed in this section, several refinement studies are necessary for this project. A refinement study will be necessary for the Miles Crossing/ Jeffers Garden area, as discussed in the Clatsop County TSP. The new roadway section alignment for the Astoria-Warrenton Parkway (from Warrenton-Astoria Highway 105 to US 101), location of the connection at US 101, and the interchange configuration at the point of connection will need to be reevaluated and refined. In addition, the concept of an overpass along the SE King Avenue extension or at SE Marlin Avenue (Warrenton-Astoria Highway 105) should be considered as the design of the Astoria-Warrenton Parkway progresses.

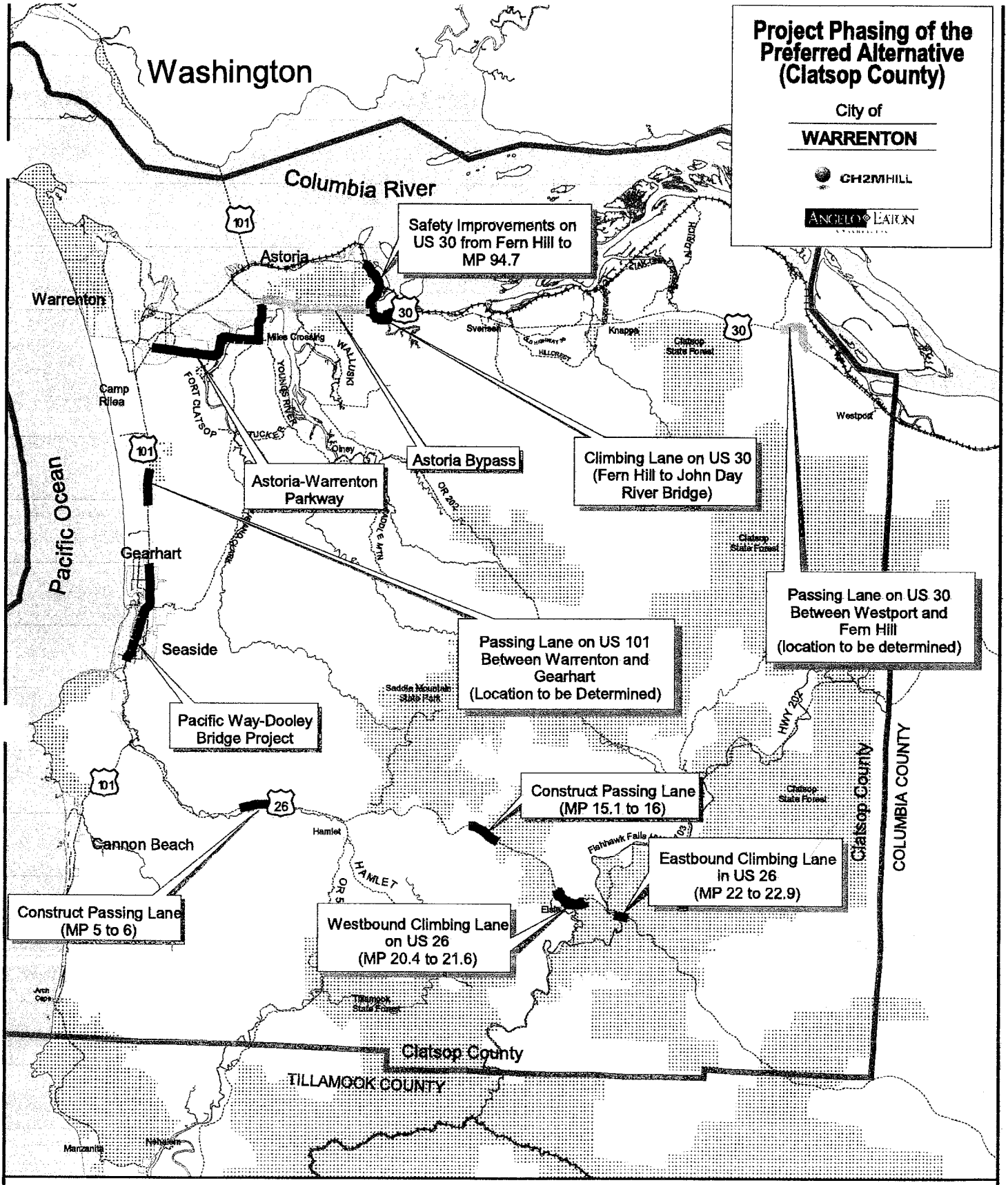
Along US 101, the preferred alternative includes additional capacity on the New Youngs Bay Bridge and improvements at the intersection of US 101 with East Harbor Drive. Because of environmental and economic constraints, it will be difficult to add capacity to the New Youngs Bay Bridge within the 20-year planning horizon. The improvements at East Harbor Drive should be constructed concurrently with improvements on the New Youngs Bay Bridge, and, therefore, are considered low priority in the 20-year planning horizon. Without additional capacity at the intersection of US 101 with East Harbor Drive, this intersection will operate at a v/c ratio of 0.82 under future, forecasted, weekday, peak-hour conditions. Under 30th-highest-hour conditions, there most likely will be congestion at this intersection and along the New Youngs Bay Bridge in year 2022.

The preferred alternative includes additional capacity at the intersection of US 101 and SE Marlin Avenue (Warrenton-Astoria Highway 105) through construction of additional right-turn lanes on the SE Marlin Avenue approaches. This project should be considered in the 20-year planning horizon.

Clatsop County Preferred Alternative

The Warrenton TSP was prepared concurrently with the Clatsop County TSP, so the preferred alternative for Warrenton is directly related to countywide improvements. As shown on Figure 4-11, the preferred alternative for Clatsop County includes construction of the Astoria-Warrenton Parkway, the Astoria Bypass, additional capacity on the New Youngs Bay Bridge, and capacity improvements on US 101, US 26, and US 30.

Construction of the Astoria-Warrenton Parkway has been given a high priority in the Clatsop County TSP, as these improvements are expected to relieve some congestion on the New Youngs Bay Bridge by diverting local traffic. After construction of the Astoria-Warrenton Parkway, construction of the Astoria Bypass is recommended (medium priority). The new section of roadway between Warrenton-Astoria Highway 105 and US 30 (Astoria Bypass) will complete the connection between US 101 and US 30 and is expected to relieve most of the congestion in Astoria.



File Path: C:\GIS\Warrenton\ProjectFile\Warrenton_TSP.apr, Date: 30 Jun 2003 13:37, User: JGATES2, Figure 4-11 - Project Phasing

Consistent with the Corridor Plans for US 26 and US 30, passing lanes are recommended on major state facilities (US 101, US 26, US 30) to improve operations (high and medium priority). Major capacity improvements on US 101, US 26, US 30, and the New Youngs Bay Bridge will be necessary for the transportation system to meet OHP mobility standards in year 2022. However, these major capacity improvements have been given a low priority in relation to other capacity improvements in the preferred alternative.

SECTION 5

Transportation System Plan

Introduction

This section includes the transportation improvements and policies that should be implemented in the next 20 years in Warrenton to improve motor vehicle operations, safety, and pedestrian and bicycle travel. The TSP also includes public transportation, air, and water elements. The transportation improvements in this section were included on the basis of the analysis of existing and future, forecasted, no-build conditions; the analysis of alternatives and projects; and the selection of a preferred alternative. This section contains the following subsections:

- State Roadway System
- Local Roadway System
- Truck Route
- Bicycle and Pedestrian System
- Public Transportation Element
- Port Element (Air, Water)

Figure 5-1 presents the locations of all the capacity and safety projects included in this section. All of the projects included in this section are not likely to be funded under existing revenue sources. The intent of this section is to prioritize all of the transportation improvements that are needed in Warrenton in the 20-year planning horizon. Within this section, each project is given a priority in terms of years, which is based on the measures of effectiveness. An order-of-magnitude cost is also included for most projects. The list of projects included in this section does not represent a financially constrained plan.

Major System Improvements

The preferred alternative (Figure 4-11) in the TSP proposes significant corridor improvements to the State Highway system. These include the following two proposed improvements that have the potential to impact the region's natural resources and can be expected to require a substantial funding commitment:

- Additional Capacity on New Young's Bay Bridge
- Astoria -Warrenton Parkway Improvements

Although the TSP has not defined specific alignments or improvement designs for these projects, it assumes these improvements will need to be part of the City's overall transportation system in the next twenty years to meet mobility and level of service standards. However, the City understands that additional planning and analysis work is required to refine regional transportation needs, further evaluate alternatives, and consider statewide planning goal requirements prior to reliance on these improvements as planned

facilities. Specifically, the proposed projects include several road and bridge improvements affecting, wetlands and estuarine areas protected in local comprehensive plans pursuant to Goals 5 (wetlands) and 16 (estuarine).

The need for the Astoria-Warrenton Parkway has been established through analysis of current and projected capacity concerns in Clatsop County, Astoria, Warrenton and on the New Young's Bay Bridge. An alternative analysis was completed and the determination made that given the magnitude of the capacity improvement need, topographic constraints, and natural and built environmental concerns, the number of alternatives is limited. However, due to the scope of these proposals, the anticipated environmental concerns, and the associated cost, it was determined that more detailed examination would be prudent. This could not be accomplished within the scope, budget, or time frame of the TSP. Following adoption of Warrenton's and Clatsop County's TSP's, a comprehensive regional planning process will be initiated to further explore options that balance the needs of the affected communities and the ability to finance them.

As these proposals move through project development, the process, at a minimum will refine the purpose, need and function for the Astoria by-pass and the Astoria- Warrenton Parkway improvements and will address key access, and land use issues affecting proposed transportation facilities and improvements as required by the Transportation Planning Rule. Any associated improvements listed in the TSP are included in this process. The remaining projects identified in the TSP serve other travel needs or would be compatible with the function, location, or mode of any solution identified in the final determination. In the case of the proposed 4-laning of US-101 in Warrenton and the New Young's Bay Bridge, further study of that portion of the proposal is deferred until an appropriate future date. The deferral of decisions related to the major capacity improvements shall not preclude implementation of the remainder of the Transportation Plan or invalidate the assumptions upon which the Transportation Plan is based. The projects will be evaluated for statewide planning goal compliance and document the results and any anticipated goal exceptions that may be required. Actual goal exceptions required will be addressed during the environmental documentation process in accordance with the State Agency Coordinating agreement (SAC) along with other Federal, State, and Local land use and permit requirements. Compliance with statewide planning goals will be addressed through an amendment to the city's transportation system plan, an element of the City of Warrenton Comprehensive Plan. Other federal, state and local environmental and land use requirements will be addressed through preparation of environmental documents and permits determined necessary for proposed projects.

State Roadway System

The state roadway network in Warrenton, including US 101, Fort Stevens Highway 104, Fort Stevens Highway 104 Spur, and Warrenton-Astoria Highway 105, serves both local and through tourist traffic. Within this section, capacity, safety, bridge, TSM/TDM, and access management improvements recommended on each state highway will be outlined. In addition, recommendations are made regarding highway segment designations, planning studies, functional classifications, and lifeline routes.

Capacity Improvements

Table 5-1 presents the capacity improvements that are recommended for state facilities in Warrenton. The projects are numbered and shown on Figure 5-1.

TABLE 5-1
Recommended Capacity Improvements on State Facilities

#	Location and Description	Estimated Cost	Priority (Years)
1	New section of Astoria-Warrenton Parkway (includes an interchange at intersection of SE Dolphin Ave and US 101, and realignment of the Astoria-Warrenton Parkway and Warrenton-Astoria Highway 105 intersection) *	$4,000,000	*See Note Below
2	Astoria-Warrenton Parkway improvements on Warrenton-Astoria Highway 105, including replacement of the Old Youngs Bay Bridge and Lewis and Clark Bridge	$47,200,000	*See Note Below
3	Add westbound left-turn lane at intersection of East Harbor Dr with SE Marlin Ave (Warrenton-Astoria Highway 105) . Realign SE Marlin Ave approach and signalize intersection	$550,000	6-10
4	Signalize intersection of Fort Stevens Highway 104 and Warrenton-Astoria Highway 105. Reconfigure intersection to accommodate trucks and improve pedestrian crossings.	$1,000,000	6-10
5	Add right-turn lanes on SE Marlin Ave (Warrenton-Astoria Highway 105) approaches at intersection with US 101.	$300,000+	11-15
6	Realignment and signalization of the Fort Stevens Highway 104 and US 101 intersection (Note: this improvement applies if right-in/ right-out only treatment is not effective). An interchange also could be considered at this location.	$1,000,000	16-20

Notes Regarding Items #1 and #2:

Subject to a Regional Refinement Plan (or Regional Transportation Study) to determine the best and most cost-effective solution(s) for the transportation needs these projects are intended to serve. Until a final determination of the function, need, environmental feasibility and phasing is made, these capacity improvements remain "conceptual" only, and do not represent planned capacity improvements."

The City understands that additional planning and analysis work is required to refine regional transportation needs, further evaluate alternatives, and consider statewide planning goal requirements prior to reliance on these improvements as planned facilities. Specifically, the proposed projects include several road and bridge improvements affecting forest, wetlands and estuarine areas protected in local comprehensive plans pursuant to Goals 4 (forest), 5 (wetlands) and 16 (estuarine).

Improvements Recommended for Regional Study:

- Future purpose, need and function of US 101 and Business Route 101
- Future purpose, need and function of the New Young's Bay Bridge
- Future purpose, need and function of the proposed Bypass and Parkway routes
- Assessment of US 101 conditions and proposed improvements from Astoria to Seaside
- Assessment of access to the Airport and Industrial sites located within Warrenton.
- A region-wide highway classifications/reclassification assessment
- Highway project prioritization and phasing
- Alternative OHP mobility standards addressing the recreational character of this region.

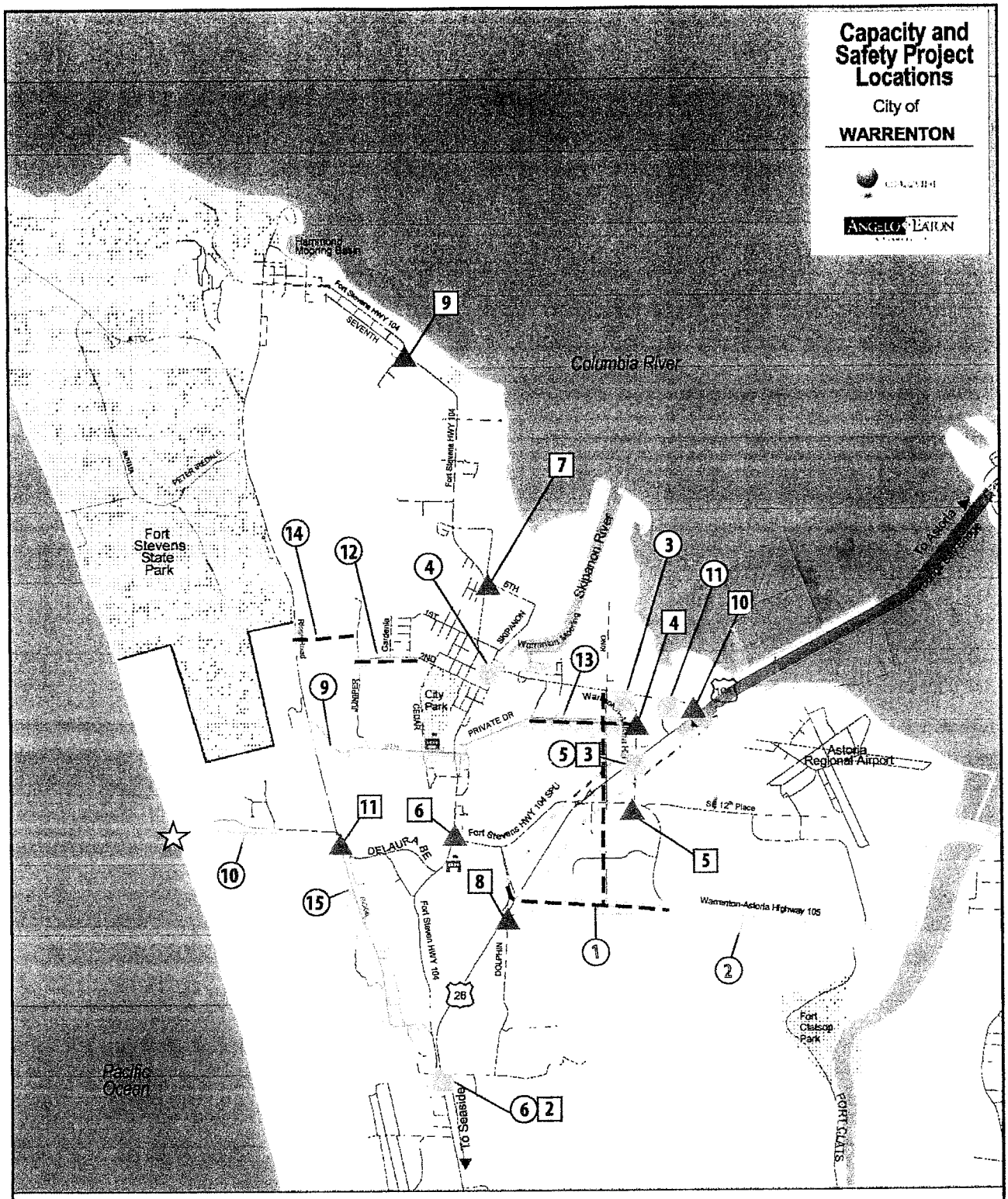


Figure 5-1
Transportation System Plan
Warrenton, OR

Note: The alignments shown for the realigned Dolphin Road approach, the Astoria-Warrenton Parkway, the Kind Road Extension, private (7th St) Extension, 2nd Street Extension, and new section of road between Ridge Road and Juniper are conceptual and not intended to represent actual alignments.

Safety Improvements

Table 5-2 presents the safety improvements that are recommended for State facilities in Warrenton. The projects are numbered and shown on Figure 5-1.

TABLE 5-2
Recommended Safety Improvements on State Facilities

#	Location and Description	Estimated Cost	Priority (Years)
2	Improvements at intersection of US 101 with Fort Stevens Highway 104. Make Fort Stevens Highway 104 leg right-out only (restrict left turn lanes from the Fort Stevens Highway 104 approach).	$25,000	1-5
3	US 101 at SE Marlin Ave Intersection Improvement Project (also includes right-in/right-out improvements at US 101 and Fort Stevens Highway 104 Spur).	$2,766,000[1]	1-5
4	Widen Warrenton-Astoria Highway 105 (SE Marlin Ave) to include sidewalk and bike lanes from East Harbor Drive and the US 101 at SE Marlin Avenue Intersection Improvement Project.	$500,000	6-10
5	Reconfigure the intersection of Warrenton-Astoria Highway 105 and SE 12th Place at Airport Lane. (Note: To be constructed with Astoria-Warrenton Parkway improvements).	$500,000	6-10
6	Shoulder widening on both sides of Fort Stevens Highway 104 (MP 4.38 to 4.49)	$50,000	11-15
7	Reconfigure the intersection of Fort Stevens Highway 104 and 5th Street	$200,000	11-15
8	Reconfigure the intersection of US 101 with Dolphin Road (Note: this improvement applies if an interchange is not constructed at this intersection).	$400,000	16-20
9	Reconfigure the intersection of Fort Stevens Highway 104 with 7th Avenue (Note: this improvement applies only if safety issue develops).	$250,000	16-20

[1]Indicates project has committed funding.

Bridge Improvements

The following bridge improvements, which are further described in the Clatsop County TSP, are recommended for State facilities in Warrenton:

- Upgrade or replace the Skipanon River Bridge No. 1400 (Fort Stevens Highway 104 Spur).
- Upgrade the New Youngs Bay Bridge No. 08306 as detailed in the 2004-2007 STIP.

Phase 1 and Phase 2 seismic retrofit projects for bridges in the vicinity of Warrenton, as detailed in the *Prioritization of Oregon Bridges for Seismic Retrofit Report* (completed in 1997), are recommended as funding becomes available.

TSM/TDM

The TSP includes many TSM solutions through the addition of turn lanes, access management, channelization improvements, and other TSM solutions. TDM solutions that should be considered are ITS solutions to divert traffic to the Astoria-Warrenton Parkway and congestion based pricing on the New Youngs Bay Bridge. In addition, construction of a more direct route between the Astoria-Warrenton Parkway and the commercial area in Warrenton should be considered (that is, King Road Overpass/Extension or Marlin Drive Overpass).

Access Management Improvements

Access management improvements are recommended for State facilities in Warrenton in the following locations:

- Construct landscaped medians on US 101 in locations recommended in the frontage road refinement plan..
- Construct landscaped medians as recommended in the Warrenton Community Visioning Plan (Fort Stevens Highway 104 in Hammond).
- Study frontage roads on US 101 to accommodate future development (Note: locations and access points to be determined through a future planning study).

Highway Segment Designations

As described in the OHP, highway segment designations of Special Transportation Areas (STA), Commercial Centers, and Urban Business Areas (UBA) guide future planning and management decisions. Each highway segment designation has specific objectives for access management, automobiles, pedestrian and bicycle accommodation, transit amenities, and development. The following designations, including definitions from the OHP, were considered for State highways in Clatsop County:

- An **STA** provides access to community activities, businesses, and residences, including pedestrian access along and across a highway, within a downtown, business district, and/or community center. An STA highway designation can be made in an unincorporated community, where road connections and parking may be encouraged.
- **Commercial Centers** are designated to provide mobility for through traffic adjacent to commercial centers. Access to State highways should be minimized in commercial centers to minimize the number of vehicle conflicts with through traffic.
- An **UBA** designation should be used in existing or future commercial areas within urban growth boundaries where access is important to economic viability of a community.

No Commercial Centers or UBAs are recommended for State highways in Warrenton. A potential STA within downtown Warrenton along Fort Stevens Highway 104 has been identified by ODOT, with medium priority at this time. Further coordination between ODOT and the City of Warrenton about a potential STA within downtown Warrenton along Fort Stevens Highway 104 should take place, including discussion about the potential for a jurisdiction transfer.

Expressway Classification

At this time, no state highways within Warrenton or Clatsop County are currently classified as Expressways. Two potential future Expressway designations have been identified as discussed below. As defined by 1A.2 of the Oregon Highway Plan, an "Expressway" is a subset of a Statewide, Regional or District highway. By OHP definition,

> Expressways are complete routes or segments of existing two-lane and multi-lane highways and planned multi-lane highways that provide for safe and efficient high speed and high volume traffic movements. Their primary function is to provide for interurban travel and connections to ports and major recreation areas with minimal interruptions... In urban areas, speeds are moderate to high. In rural areas, speeds are high. Usually, there are no pedestrian facilities, and bikeways may be separated from the roadway.

The criteria considered by the Oregon Transportation Commission to classify a highway as an Expressway include the following:

- Designation as part of a State Highway Freight System
- Designation as a safety corridor; or
- Function as an urban bypass

The process for classification of a highway as an Expressway varies, depending on a number of factors, including existing highway classification, access management conditions and safety issues. The Transportation Commission will classify Interstate and Statewide highways (such as US 101) in consultation with local governments. The Commission will classify Regional and District Highways (such as Business Route 101) with the agreement of directly affected local governments.

Astoria-Warrenton Parkway (Warrenton-Astoria Highway 105)

Consideration of an Expressway classification for the existing Business Route 101 from Astoria to Warrenton assumes that it would become a functional extension of the proposed Astoria Bypass, as discussed above and proposed by the Preferred Alternative. As such, Expressway classification would increase the integrity of the entire Bypass Route, including this extended Bypass portion, by reducing traffic safety hazards and assuring proper access management to maintain necessary traffic flows.

Business Route 101 is currently classified as a District highway. Alternative classifications include Regional highway and Expressway. Further discussion of which highway classification that would best serve the intended function of the Astoria-Warrenton Parkway should be addressed in the proposed Miles Crossing/Jeffers Garden Transportation Refinement Study, which will also address access management and street spacing standards along the Parkway alignment. The Miles Crossing/Jeffers Garden area is outside the city limits of Warrenton, but will influence the overall performance of the Astoria-Warrenton Parkway.

US 101, from New Youngs Bay Bridge to Gearhart

The segment of US 101 from Smith Point to Gearhart has been identified by ODOT as a potential future Expressway route, with a low priority designation at this time. Further consultation with the County and the City of Warrenton may take place during a future

Refinement Plan focused on the implementation of frontage roads and access management measures within Warrenton. According to the Oregon Highway Plan, Policy 1A.2.b, the classification of a Statewide Highway as an Expressway by the Transportation Commission would take place in consultation with local governments. Issues that remain to be addressed within this segment of US 101 include the location of existing and future intersections, interchanges and overpasses and other aspects of access management planning.

Planning Studies

Table 5-3 presents the recommended planning studies for state facilities within the vicinity of Warrenton.

TABLE 5-3
Recommended Planning Studies on State Facilities

Location and Description	Priority (years)
Planning study for additional capacity on the New Youngs Bay Bridge [2]	20
Refinement Plan for Jeffers Garden/Miles Crossing Area. Note: this area is outside the city limits of Warrenton. See Clatsop County TSP for further information on this study.	1-5
Additional turn lanes at the East Harbor Drive and US 101 Intersection (eastbound left-turn lane, northbound through lane, and southbound through lane). An interchange also could be considered at this location.	20
Planning Study to determine feasible locations for frontage roads and landscaped medians on US 101. [1]	N/A
Planning Study for Fort Stevens Highway 104 to address streetscape improvements, drainage, pedestrian, and bicycle issues.	1-5
Planning Study for the intersection of US 101 and East Harbor Drive	1-5
Planning Study for Overcrossing Location (SE King Street Extension or SE Marlin Ave Overpass)	1-5

1 To be conducted as part of commercial/industrial development or independent of development.

2 To be conducted following the implementation of the Astoria-Warrenton Parkway improvements

Maintenance/Preservation/Operations

The TSP for Warrenton does not recommend specific maintenance, preservation, and operations projects to meet the needs of the transportation system throughout the 20-year planning horizon. However, the project list in Appendix A includes some of the maintenance, preservation, and operations projects that should be implemented to address existing deficiencies.

Proposed Functional Classifications

Under the Warrenton TSP, changes to the functional classifications of most State facilities are not recommended. US 101 should continue to be classified as a principal arterial. The Astoria Bypass and Astoria-Warrenton Parkway also should be classified as principal arterials. Minor corridors, such as Fort Stevens Highway 104, and Fort Stevens Highway 104 Spur, and Warrenton-Astoria Highway 105, should continue to be classified as urban collectors or rural major collectors.

Lifeline Routes

The following new segments of highway, which are recommended under the preferred alternative, should be designated as lifeline routes:

- Astoria Bypass Alignment
- Astoria-Warrenton Parkway Alignment

Local Roadway System

Functional Classification and Design Standards

This section summarizes the proposed functional classifications and associated standards for local roads in Warrenton to meet transportation system needs in the 20-year planning horizon.

Functional Classifications

The proper classification of each roadway is important to help determine the appropriate traffic control, design standards, pedestrian and bicycle facilities, and access to adjacent properties for a roadway segment. The following functional classifications are proposed in the Warrenton TSP:

- **Arterial Roadways.** The primary function of an arterial roadway is to provide mobility. Therefore, arterials typically carry higher traffic volumes and allow higher travel speeds while providing limited or no access to adjacent properties.

- **Collector Roadways.** The function of a collector roadway is to collect traffic from local streets and provide connections to arterial roadways. Generally, collectors operate with moderate speeds and provide more access in comparison to arterials.

- **Local Roadways.** The primary function of a local roadway is to provide access to local traffic and route users to collector roadways. Generally, local roadways operate with low speeds, provide limited mobility, and carry low traffic volumes in comparison to other roadway classifications. As part of the Warrenton TSP, the functional classifications of City and County roadway facilities in Warrenton have been reviewed. Figure 5-2 displays the recommended functional classifications for State and local road facilities.

ODOT has identified the functional classifications of roadways within the City limits of Warrenton. ODOT classifies only roadways of statewide significance. Therefore, several roadway segments that are currently classified as local roadways by ODOT were identified as potential collectors by the Public Works Superintendent for Warrenton and the Warrenton City Planner. As part of the Warrenton TSP, the functional classifications of County and City roadway facilities in Warrenton have been reviewed and modifications have been suggested where applicable. Figure 5-2 displays the proposed functional classifications.

The following County and City facilities are recommended to be classified as collectors:

- **SE 12th Place**—To the entrance to Warrenton-Astoria Highway 105
- **Delaura Beach Lane**—Ridge Road to end
- **Delaura Beach Lane**—Fort Stevens Highway 104 to Ridge Road
- **SW 9th Street**—Fort Stevens Highway 104 to Ridge Road
- **Lake Drive**—Fort Stevens Highway 104 to Hammond Marina
- **Seventh Avenue**—Fort Stevens Highway 104 to Iredale Road
- **NE 5th Street**—Fort Stevens Highway 104 to NE Skipanon Drive
- **NE Skipanon Drive**—NE 5th Street to Fort Stevens Highway 104
- **NW 1st Street**—Fort Stevens Highway 104 to NW Gardenia Avenue
- **SW 2nd Street**—Fort Stevens Highway 104 to SW Juniper Avenue (plus future connection road to Ridge Road)
- **SW Juniper Avenue**—SW 9th Street to SW 2nd Street (and to future connection road)
- **SE Dolphin Avenue**—Fort Stevens Highway 104 Spur to US 101
- **SE Neptune Avenue**—US 101 to East Harbor Drive
- **East Harbor Drive**—Warrenton-Astoria Highway 105 to US 101
- **Ridge Road**—Fort Stevens Highway 104 to Delaura Beach Lane
- **SE 19th Street (North Coast Business Park Road)**—Highway 105 to end

All roadway facilities not listed above are recommended to be classified as local roads.

Design Standards

Roadway design standards were developed for each functional classification proposed in this TSP for City facilities. Each functional classification requires different design standards based on the operating conditions (volumes, access management, speeds) and users (bicyclists, pedestrians, motorists) of the roadway segment. The design standards proposed in this TSP are intended for use in new roadway construction, and where feasible, reconstruction of existing roadway facilities. See Figures 5-3, 5-4, and 5-5 for the proposed design standards. Design standards for state highways are contained in the Highway Design Manual of ODOT.

Capacity Improvements

Table 5-4 presents the capacity and widening improvements that are recommended for local facilities in Warrenton. The projects are numbered and shown on Figure 5-1.

Figure 5-2
Proposed Functional Classifications
Front

Figure 5-3
front

Figure 5-4
front

Figure 5-5
front

TABLE 5-4
Capacity and Widening Improvements on Local Facilities

#	Location and Description	Estimated Cost	Priority (Years)
9	Widen SW 9th Street from Fort Stevens Highway 104 to Ridge Road (upgraded width to include bike lanes, sidewalks, and drainage)	$1,700,000	6-10
10	Widen Delaura Beach Lane from SW Pine Drive to the beach (upgraded roadway width includes shoulders). As part of the jurisdictional transfer of Delaura Beach Lane from Clatsop County to Warrenton, the County will also be overlaying Delaura Beach Lane from Ridge Road to SW Pine Drive and reconstructing Delaura Beach Lane for approximately 1070 feet west of SW Pine Drive.	$775,000	6-10
11	Signalize intersection of East Harbor Drive with SE Neptune Ave	$300,000	6-10
12	Connect SW Juniper Avenue with SW 2nd Street (includes sidewalks, curb, and storm drainage)	$685,000	11-15
13	Construct curb, sidewalk, and new (winding, low traffic speed) local street along Private Drive (SE 7th Street) from Fort Stevens Highway 104 to SE Marlin Ave (Warrenton-Astoria Highway 105). Includes a bridge crossing over the Skipanon Slough.	$3,530,000	16-20
14	Connect SW/NW Juniper Avenue with Ridge Road (includes sidewalks, curb, and storm drainage)	$550,000	11-15
15	Old Ridge Road – widen shoulders to 28' (South of Warrenton)	(1)	6-10

(1) This project is included in the Clatsop County TSP.

Safety Improvements

Table 5-5 presents the safety improvements that are recommended for local facilities in Warrenton. The projects are numbered and shown on Figure 5-1.

TABLE 5-5
Recommended Safety Improvements on Local Facilities

#	Location and Description	Estimated Cost	Priority (Years)
10	Addition of mirror at 90-degree corner (Shilo Inn access)	$1,000	1-5
11	Reconfigure Delaura Beach Lane and Ridge Road intersection. Investigate the possibility of a roundabout at this location.	$500,000	11-15

Access Management

Access management improvements are recommended for local facilities in Warrenton in the following locations:

- Between Costco and Fred Meyer, remove section of curb to improve circulation between the shopping centers
- On East Harbor Drive, construct landscaped medians

Designated Truck Route

Warrenton currently does not have designated truck routes. As part of the Warrenton TSP, a recommended truck route was developed to provide access to industrial areas while minimizing truck volumes in the downtown Warrenton area and in the vicinity of parks and schools. The following local roads currently provide access to industrial areas:

- NW 13th Street
- NE 5th Street
- NE Skipanon Drive. To avoid conflicts between truck traffic and residential/commercial use on NE Skipanon Drive, trucks could be routed along NE 5th Street only.
- SE 12th Place (airport access road)
- SE Flight Line Drive
- SE Dolphin Avenue
- SE 19th Street (North Coast Business Park Road)

The following State facilities that connect with US 101 are recommended to be designated truck routes:

- Fort Stevens Highway 104 between Hammond and Warrenton-Astoria Highway 105
- Warrenton-Astoria Highway 105 between Fort Stevens Highway 104 and SE 12th Place
- East Harbor Drive between Warrenton-Astoria Highway 105 and US 101
- SE Neptune Ave between East Harbor Drive and US 101
- Astoria-Warrenton Parkway Alignment between US 101 and Astoria Bypass

See Figure 5-6 for designated truck routes.

Pedestrian System Plan

Pedestrian activity in Warrenton is generally concentrated in the downtown commercial core (Fort Stevens Highway 104), the newer residential area to the west of Fort Stevens Highway 104, and the newer residential development in the Hammond area near Fort Stevens State Park. The City's scenic character also promotes pedestrian activity around recreational features, such as the 4.5-mile Warrenton Waterfront Trail. The focus of the Pedestrian System Plan is to improve connections within the community and enhance pedestrian access to Warrenton's recreational features.

Providing a connected network of pedestrian facilities in Warrenton is important for:

- Serving shorter pedestrian trips from neighborhoods to area recreational and activity centers, such as schools, churches, and neighborhood commercial uses
- Providing access to public transit

Figure 5-6
front

- Meeting residents' and visitors' recreational needs
- Providing circulation in the town center

To meet specific goals and objectives identified in this TSP, the City of Warrenton will encourage walking as a means of transportation by addressing the following:

- **Connectivity.** The City will work to develop a connected network of pedestrian facilities. Connected networks are important to provide continuity between communities and to improve safety.
- **Safety.** The City will work to provide a secure walking environment. For residents to use the pedestrian system, it must be perceived as safe.
- **Design.** The City can ensure pedestrian-oriented urban design by adopting policies and development standards that integrate pedestrian scale, facilities, access and circulation into the design of residential, and commercial and industrial projects.

The Warrenton Pedestrian System Plan identifies system and facility improvements that will contribute to a safe and well-connected pedestrian environment. As a result, it will promote walking as a viable transportation alternative.

Pedestrian Facility Improvements

The Warrenton pedestrian system generally can be characterized as comprehensive in certain areas of the City and lacking in others. Gaps in connectivity exist between neighborhoods with regard to pedestrian facilities. In general, the high number of private accesses and conflict opportunities are a barrier to continuous, connected pedestrian facilities in certain areas of Warrenton.

Sidewalks

Existing sidewalks generally are located in the concentrated downtown commercial core (Fort Stevens Highway 104), and in newer, close-in, residential areas. Rather than sidewalks, many local streets have only footpaths alongside roadways, which indicate pedestrian use. Sidewalk condition varies. In some areas, the sidewalks intermittent and do not comply with ADA ramping and width requirements.

To provide a network of safe and connected facilities that will promote a balanced transportation system, sidewalk improvements have been identified. Particular focus is placed on increasing pedestrian safety by installing new sidewalks on one or both sides of portions of East Harbor Drive, SE Neptune Avenue, SE Marlin Avenue, Fort Stevens Highway 104 (particularly along Pacific Drive in Hammond and along the South/North Main Avenue sections in Warrenton), and Fort Stevens Highway 104 Spur, and portions of the Warrenton-Astoria Highway 105. Where sidewalks do not exist and where it is not feasible to build them, shoulder widening is recommended.

Crosswalks

To assist pedestrians in crossing busy roadways, marked and/or signalized crosswalks and pedestrian warning signage should be installed at several potentially hazardous intersections, including the Fort Stevens Highway 104 and Warrenton-Astoria Highway 105

intersection. Additional crosswalks will be constructed to connect local streets with Warrenton Elementary School, the community center, the soccer fields on Ridge Road and City Park.

Signage and Other Pedestrian Facilities

To improve the safety and visibility of the Warrenton Waterfront Trail, and better connect foot traffic to it, new identification signage and pedestrian facilities, such as restrooms, lighting, and trash receptacles, are recommended.

Projects

Table 5-6 displays the recommended pedestrian facility improvements along existing streets and roads for the next 20 years. Each of these projects is shown in Figure 5-7.

Pedestrian Standards and Policies

To enhance pedestrian safety, circulation, and connectivity, and to comply with the TPR, several changes have been proposed to the Warrenton Development Code. Transportation facilities (which include pedestrian facilities) are now permitted either outright or conditionally in each of the City's base zones. Much of the pending language in the Warrenton Development Code that supports pedestrian safety and circulation (such as access management and access spacing) has been recommended for adoption. New street design standards, reflected in new street cross –sections, require sidewalks along all new urban arterials and collectors. Sidewalks will be required for new local streets when located in high-density zones. Planting strips (which are shown in the standards as optional features) can serve to buffer pedestrians from automobile traffic. These new standards and policies encourage pedestrian trips because they facilitate safe, direct and convenient access to local destinations. See Section 7 (Implementing Ordinances) for detailed information on recommended amendments to the Warrenton Development Code.

Bicycle System Plan

Bicycle travel offers commuters, children, and others a significant option for transportation and is a valid transportation choice for people who do not own vehicles. Cycling is also an important recreational option, especially in scenic areas of Oregon, such as Warrenton.

This Bicycle System Plan establishes a network of bicycle lanes and routes throughout Warrenton, to connect trip generators and provide a safe, interconnected bicycle system. While all roadways and streets can be used as bikeways, designated routes along bicycle streets and roads and/or separated bicycle lanes on busy streets can improve safety as well as increase bicycle use.

Bicycle Facility Improvements

Figure 5-8 is a map that illustrates the recommended bicycle plan for Warrenton. It includes County- and State-designated facilities throughout the City, including shared roadways, shoulder bikeways, bicycle lanes, and designated bike routes. Table 5-7 describes Warrenton's designated bicycle routes by their corresponding map number in Figure 5-8 and labels them as County or State facilities.

TABLE 5-6
Pedestrian System Improvements

Number	Location and Description	Estimated Cost	Priority (years)
1	US 101: New Youngs Bay Bridge: Pedestrian/bicycle improvements (MP 4.97)	$1,090,000[1]	1-5
2	Fort Stevens Highway 104: Add bike lanes and sidewalks from East Harbor Drive to US 101 (MP 3.44-4.68)[1]	$486,000	1-5
3	Fort Stevens Highway 104: Install curb and sidewalks on both sides from Lake Drive to NW 13th Street (MP 0.1 to 1.18)	$1,170,000[2]	6-10
4	NW Warrenton Drive: Complete sidewalk improvements between NW 13th Street and NW 1st Street	Undetermined	6-10
5	Fort Stevens Highway 104: Install curb and sidewalks on both sides from East Harbor Drive to NE Skipanon Drive (MP 3.28 to 3.4,0.12 mile)	$130,000	6-10
6	Fort Stevens Highway 104: Install curb and sidewalks both sides, south of SW 14th Street (MP 4.73 to 4.82, 0.09 mile)	$100,000	6-10
7	Fort Stevens Highway 104: Signalize, reconfigure intersection, and improve pedestrian crossings at intersection of Fort Stevens Highway 104 and Warrenton-Astoria Highway 105 (MP 3.32)	$1,000,000	6-10
8	Fort Stevens Highway 104: Add crosswalk for better pedestrian access to elementary school at SW 9th Street.	$5,000	1-5
9	Fort Stevens Highway 104 Spur: Construct curb and sidewalk on both from US 101 to Fort Stevens Highway 104	$920,000	11-15
10	Warrenton-Astoria Highway 105/SE Marlin Ave: Construct sidewalks and bike lanes both sides of SE Marlin Ave to US 101. (At MP 0.87 to US 101)	$460,000	6-10
11	Warrenton-Astoria Highway 105: Install curb and sidewalks both sides of road from west end of facility to SE Marlin Avenue (MP 0 to 0.87)	$950,000[1]	6-10
12	SW 9th Street: Upgrade width with bike lanes and sidewalks on SW 9th Street to Ridge Road. (Note: Cost estimate does not include right-of-way, which will be required for the project.)	$1,700,000[1]	6-10
13	Delaura Beach Lane: Upgrade roadway width with shoulders from SW Pine Drive to end	$775,000[1]	6-10
14	SW Alder Avenue—Install marked crosswalks near community center/park	Undetermined	6-10
15	SW Cedar Avenue/SW 7th St—Upgrade crosswalks to be ADA-compliant at Warrenton Elementary School	Undetermined	6-10
16	East Harbor Drive: Add curb and sidewalk on both sides of street from US 101 west to SE Marlin Avenue	$670,000	6-10
17	SE Neptune Avenue: Add sidewalks and bike lanes on both sides of street from US 101 to E Harbor Drive (0.23 mile)	$280,000	6-10

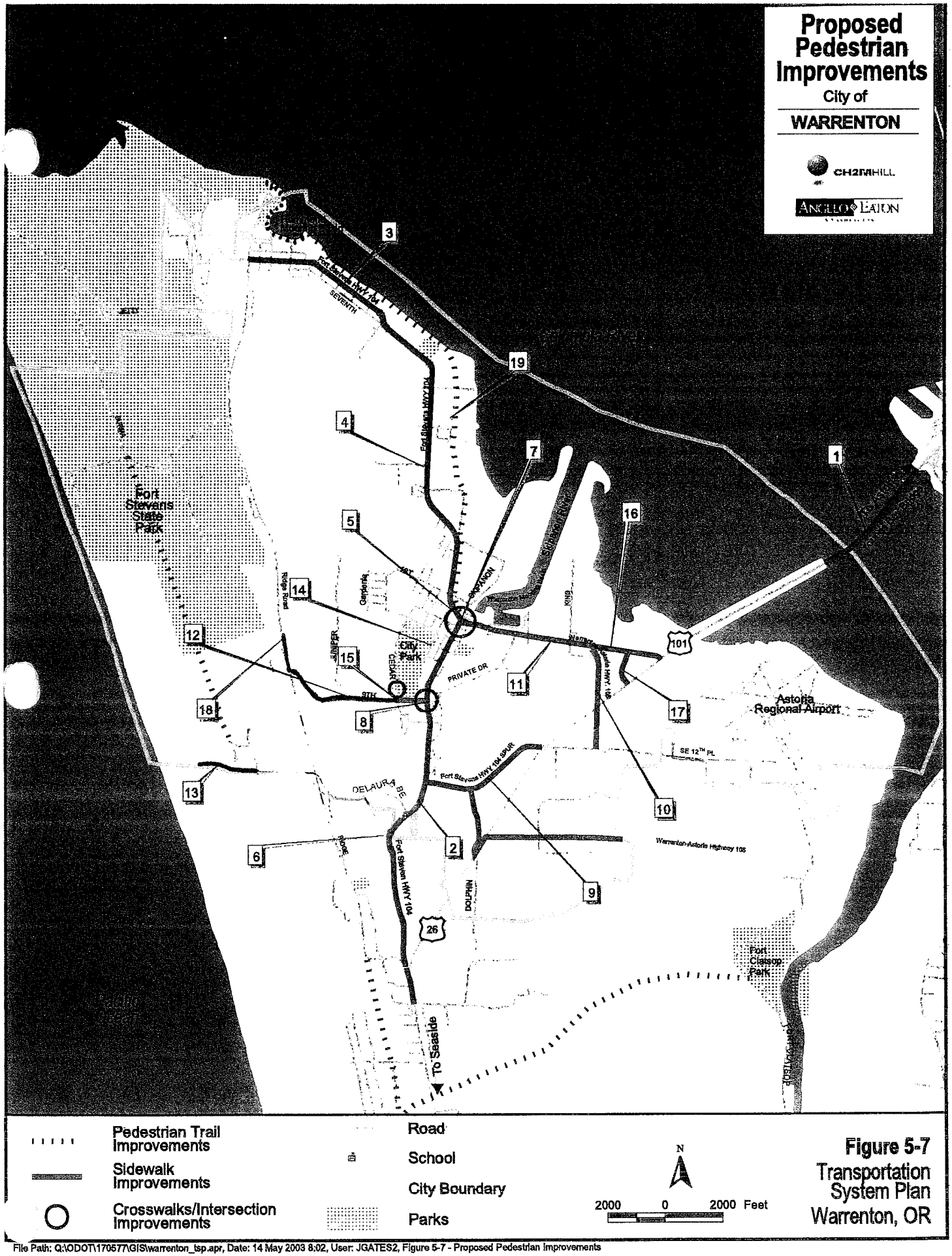
TABLE 5-6
Pedestrian System Improvements

Number	Location and Description	Estimated Cost	Priority (years)
18	Ridge Road: Install sidewalks from SW 9th Street north along soccer fields.	$1,000,000+	1-5
19	Improved signage, visibility for Warrenton Waterfront trail	$15,000	6-10
20	Warrenton Waterfront Trail: Improved pedestrian amenities including restrooms, lighting, trash receptacles	Undetermined	11-15
21	Pave top of dike from intersection of Highway 104 and Highway 105 and Hammond	$325,000	11-15
22	Construct multi-use path through Fort Stevens State Park along Burma Road to Delaura Beach Road	$1,000,000[3]	6-10
23	Multi-use path to connect Hammond to Fort Stevens State Park	$0[3]	1-5
24	Pave top of dike near Airport from Hwy 105 by Lewis and Clark bridge to US101	$440,000[3]	11-15

[1]Pedestrian or Bicycle portion of project is a part of a larger Modernization improvement. Cost will only be accounted for one time, as part of the Modernization improvements.

[2]Project cost to be revised as part of the Fort Stevens Highway 104 Refinement Study.

[3]Project includes improvements to bicycle and pedestrian system and is listed on Table 5-8, Bicycle System Improvements as well. Though listed twice, the cost will only be accounted for one time.



File Path: Q:\ODOT\170577\GIS\warrenton_tsp.apr, Date: 14 May 2003 8:02, User: JGATES2, Figure 5-7 - Proposed Pedestrian Improvements

Figure 5-8
front

TABLE 5-7
Warrenton Designated Bicycle Routes

Map Number	Bike Facility Name	Between		Management
1	US 101	New Young's Bay Bridge	Seaside Border	State
2	Fort Stevens Hwy 104	Ridge Rd	US 101	State
3	Warrenton-Astoria Hwy 105	Fort Stevens Hwy 104	Astoria Border	State
4	Fort Stevens Hwy 104 Spur	Fort Stevens Hwy 104	US 101	State
5	Peter Iredale Rd	Ridge Rd.	Burma Rd.	Joint
6	Ridge Rd.	Fort Stevens Hwy 104	Delaura Beach Lane	County
7	Delaura Beach Lane	Fort Stevens Hwy 104	End	County
8	SW 9th Avenue	Ridge Rd.	Fort Stevens Hwy 104	Local
9	SE Neptune Avenue	US 101	East Harbor Drive	Local
10	East Harbor Drive	Warrenton-Astoria Highway 105	US 101	Local
11	SW Juniper Avenue	SW 2nd Street	SW 9th Street	Local
12	SW 2nd Street	Hwy 104	SW Juniper Avenue	Local
13	SW Cedar Avenue	SW 2nd Street	SW 9th Street	Local
14	Old Stagecoach Road	Entire route		County

Approximately 1.5 miles of the 370-mile Oregon Coast Bike Route passes through Warrenton along US 101. The Oregon Coast Bike Route uses marked bike lanes or shoulders that are 3 feet wide or wider and are marked with signage.

The remainder of the Warrenton bicycle system generally consists of either shared roadways (particularly on local roads) or shoulder bikeways and are characterized by good pavement condition. Aside from the Oregon Coast Bike Route, most bikeways are not marked with bicycle signage. The bicycle system lacks some connectivity in certain areas of Warrenton, such as north-south and east-west routes through town, and routes are characterized by a relatively high number of vehicle access points, which can cause barriers or hazards for bicyclists.

Bikeway and Trail Improvements

To promote safe and convenient bicycle links between commercial, recreational, and other land uses, improvements to the bicycle system have been identified. To improve connectivity, new bicycle lanes are proposed along both sides of the Fort Stevens Highway 104 Spur and for approximately 1 mile along 9th Street. Bikeways also are planned for construction along Fort Stevens Highway 104 from US 101 near Warrenton High School north to West Harbor Street. These projects are part of the OTC-approved 2002-2005 STIP.

Further, to better connect bicycle traffic with popular recreational areas such as Fort Stevens State Park, a bicycle trail between the park and Hammond has been identified as a high priority project.

Signage

To promote safety and awareness of bicyclists where they share facilities with pedestrian and vehicular traffic, designation signage is recommended along Warrenton-Astoria Highway 105 and US 101.

Bicycle Parking

To comply with the standards stated in the OBPP, bicycle parking will be installed at community activity centers, such as the soccer fields, the city park, and downtown.

Projects

Table 5-8 presents the recommended bicycle route improvements required during the next 20 years.

TABLE 5-8
Bicycle System Improvements

Location and Description	Est. Cost	Priority
US 101—Install signage indicating bicyclists in outer lane (MP 4.97 to 9.48)	$5,000	11-15
US 101: New Youngs Bay Bridge: Pedestrian/bicycle improvements (MP 4.97)	$1,090,000[1]	6-10
Fort Stevens Highway 104—Add bike lanes and sidewalks from E. Harbor Drive to US 101 (MP 3.44 to 4.68)	$486,000[1]	1-5
Fort Stevens Highway 104 Spur—Stripe 6-foot-wide bike lanes on both sides of road (includes minor widening) (Fort Stevens Highway 104 - US 101)	$25,000	6-10
Warrenton-Astoria Highway 105—Add bicycle route designation signage (MP 0 to 2.35)	Undetermined	6-10
SW 9th Street—Upgrade width with bike lanes and sidewalks. (Note: Cost estimate does not include right-of-way, which will be required for the project.)	$1,700,000[1]	6-10
Delaura Beach Lane—Upgrade roadway width with shoulders from SW Pine Drive to end	$775,000[1]	6-10
Multi-use path to connect Hammond to Fort Stevens State Park	$0[3]	1-5
City Park—Install bicycle parking	$1,000	6-10
Downtown—Install bicycle parking	$1,000	6-10
Soccer fields—Install bicycle parking	$1,000	6-10
Pave top of dike near Airport from Hwy 105 by Lewis and Clark bridge to US101	$440,000[3]	11-15
Construct multi-use path through Fort Stevens State Park along Burma Road to Delaura Beach Road	$1,000,000[3]	6-10
Old Ridge Road – widen shoulders to 28'	[2]	6-10

[1] Pedestrian or Bicycle portion of project is a part of a larger Modernization improvement. Cost will only be accounted for one time, as part of the Modernization improvements.

[2] Project is from Clatsop County TSP and the cost is accounted for by the County

[3] Project includes improvements to bicycle and pedestrian system and is listed on Table 5-6, Pedestrian System Improvements as well. Though listed twice, the cost will only be accounted for one time.

Bicycle Standards and Policies

To enhance bicycle safety, circulation and connectivity, and to comply with the TPR, several changes have been proposed to the Warrenton Development Code. Transportation facilities (which include bicycle facilities) are now permitted either outright or conditionally in every one of the City's base zones. Much of the pending language in the Warrenton Development Code that supports bicyclist safety, use and circulation (such as access management) has been recommended for adoption. Specific bicycle parking standards also have been recommended for inclusion in the Development Code, as well as the adoption of new cross sections for arterials, collectors, and local streets. These cross sections reflect new street design standards, which require bikeways on all arterials and collectors (that meet a certain traffic threshold) constructed in the city. These new standards and policies encourage bicycle trips because they facilitate more direct, safe, and convenient access to local destinations. See Section 7 (Implementing Ordinances) for detailed information on recommended amendments to the Warrenton Development Code.

Public Transportation

The following opportunities and policies from the SETD Comprehensive Transportation Plan should be explored:

- **Decrease the reliance on single occupancy vehicles in Clatsop County.** To meet this goal, services available to low-wage workers and Dial-A-Ride users would need to be strengthened. In addition, the hours of operation and service frequency would need to be expanded.
- **Cut travel time.** Transit users that currently commute between Astoria and Seaside cite travel time as an inconvenience to public transit usage. As stated in the SETD Comprehensive Transportation Plan, ways to cut travel time should be explored.
- **Extend hours of operation** to allow users with alternative work schedules to use transit services.
- **Decrease the headway between buses** to minimize wait time for users.
- **Review scheduling and routes** and make changes as necessary. Incorporated communities have both residential and tourist related needs. Each of the incorporated communities also has both intercity and intracity public transportation needs that should be addressed.
- **Improve the efficiency of the DAR program** to serve more users. According to the SETD Comprehensive Transportation Plan, the system currently serves an average of one user per hour. By grouping DAR trips generated in the same location and assigning DAR drivers to a specific geographic zone, the program would serve more riders for the same cost throughout Clatsop County. The use of specialized software and training for DAR employees would be necessary to improve the efficiency of the program.

- **Meet the transit demands created by future development**, including the relocation of Clatsop Community College and the North Coast Business Park.
- **Consider the loss of transit connections with Washington.**
- **Improve connections** with other transit service providers. Currently, connections between transit service providers, including Pacific Transit, Oregon Coachways, and the Cannon Beach Shuttle, are not well coordinated.
- **Advertise and promote** SETD services.
- **Maximize the potential of the proposed intermodal center**, by using the facility to educate users about transit options and community events, in addition to providing an efficient transfer point between services.

In addition, the following opportunities also should be explored:

- Transit amenities, including covered benches, signage, and concrete landing pads, should be considered for stops with high ridership in Warrenton. These amenities would make the system more visible to potential users and possibly attract new riders. Also, as mentioned previously, all transit stops should be accessible to all potential riders per ADA standards.
- TDM measures, such as rideshare programs and Park and Ride facilities, should be considered. The City of Warrenton should coordinate with Clatsop County, ODOT, and SETD to implement carpooling programs or Park and Ride facilities if there is a demand for these programs.
- Currently, there is SETD service in Astoria (Route 10), between Astoria and Warrenton (Route 15), between Seaside and Cannon Beach (Route 20), in Seaside (Route 25), and among Astoria, Warrenton, and Seaside (Route 101). Intercity bus service in Warrenton should be considered to better serve seasonal usage at Fort Stevens State Park and KOA, connecting these facilities with downtown Warrenton and the commercial area along US 101. In addition, extending fixed route service along Fort Stevens Highway 104 south of SE Dolphin Avenue should also be considered.
- Currently, high volumes of local traffic travel across the New Youngs Bay Bridge from Astoria to the Warrenton commercial area. To reduce traffic volumes across the New Youngs Bay Bridge, opportunities to improve transit service between the Astoria and the Warrenton commercial area should be explored.
- Because of low ridership, previous routes that provided service between Astoria and Westport and between Warrenton and Jewell through Seaside have been cancelled. Future service to connect unincorporated communities such as Arch Cape, Knappa, Westport, and Miles Crossing with incorporated communities should be considered.

Mechanisms to fund additional transit projects listed in relevant planning documents should be explored:

- New Youngs Bay Bridge—kiosks and shelters north and south of the bridge on US 101 (Astoria TSP)

- Improve transit between the Willamette Valley and Seaside and between Cannon Beach and Astoria (Draft Oregon Coast Highway Corridor Master Plan)
- Fort Clatsop Shuttling System (2002-2005 STIP)
- Intermodal Facility Improvements (2002-2005 STIP)

Port Element

Astoria Regional Airport

The following projects for the Astoria Regional Airport have been identified through the Astoria Airport Master Plan (1993), the Astoria TSP, and discussions with the Airport Manager:

- Runway safety areas for the 13/31 runway need to be modified to meet Federal Aviation Administration (FAA) standards (Should be complete by the summer of 2003).
- The existing water facilities at the airport do not meet minimum standards.

From the field inventory, improved signing to the airport and improved signing and striping in the airport area are recommended.

Currently, the Astoria Regional Airport does not provide commercial air passenger service. However, SkyTaxi Service, which provides the ability for passengers to make arrangements to fly from Astoria to hub airports or out-of-the way destinations is available at the Astoria Regional Airport. If commercial air passenger service is to be reinstated at the airport in the future, the following issues would need to be addressed:

- As stated in the Astoria Airport Master Plan (1993), the current access to the airport should be improved to provide a more direct access with an improved alignment.
- A larger passenger terminal building with parking might be necessary if commercial air passenger service is reinstated.
- The airport would need to upgrade security to meet new security requirements.

Financing for projects at the Astoria Regional Airport has not been investigated.

Warrenton Mooring Basin

The Warrenton Mooring Basin is located near downtown Warrenton. Parking facilities at the Warrenton Mooring Basin are not adequate for the demand, causing users to park outside of the designated parking areas along local roads and State highways during peak periods of use. Opportunities for additional parking facilities at the Warrenton Mooring Basin should be explored. Financing for additional parking at the Warrenton Mooring Basin has not been investigated.

Hammond Marina

The Hammond Marina is located in the Hammond area along the Columbia River. Parking facilities at the Hammond Marina are generally adequate for the demand. Access to the

marina is provided along Lake Drive and Iredale Street. During the busy fishing season, traffic from the marina often queues from the boat ramp to Fort Stevens Highway No. 104. Opportunities for a better circulation plan at the marina should be explored. Financing for an improved circulation plan has not been investigated.

Rail Element

There are currently no rail facilities in Warrenton. All historic railroad beds in Warrenton have been abandoned and many are presently used as trails. A railroad trestle that connected Warrenton to Astoria across Youngs Bay was removed in the 1980s. If additional capacity is constructed on the New Youngs Bay Bridge, the extension of rail from Astoria to Warrenton should be considered. Extension of rail over Youngs Bay would likely be dependent upon development of a market that would use freight rail as a mode of transportation within the vicinity of Warrenton (i.e. Camp Rilea).

SECTION 6

Transportation Funding Plan

As specified in the TSP guidelines, the Warrenton TSP must include a transportation financing program that includes the following aspects:

- A list of transportation facilities and major improvements
- A general estimate of timing for planned transportation facilities and major improvements
- Rough cost estimates for planned transportation facilities and major improvements
- A discussion of existing and potential future financing sources

This section of the Warrenton TSP presents the transportation financing plan for improvements that were previously identified in Section 5. Within this section, existing local, State, and Federal funding sources are described. Potential future funding sources for projects included in the Warrenton TSP also are discussed.

Existing and Projected City Funding Sources

Table 6-1 summarizes City of Warrenton revenues and expenditures for transportation maintenance and capital improvements during the past 5 fiscal years (1997 through 2002). As shown in Table 6-1, the City of Warrenton's primary sources of transportation revenue over the past 5 fiscal years were state gas taxes (83%), road district funds (9%), grants (4%), miscellaneous revenue (2%), and transfers (2%).

Table 6-1 also illustrates how local transportation funds were spent over past 5 fiscal years. The City of Warrenton spent approximately half of their transportation funds on capital street improvements, and half on maintenance projects. As is evident from this table, transportation funding was variable over the 5-year period, averaging a little over $200,000 per year.

Table 6-2 summarizes the projected budgets for years 2002 through 2025. The City of Warrenton expects their funding for transportation projects to remain relatively constant until year 2025, averaging over $220,000 per year.

Existing County Funding Sources

In Warrenton, there are only two County roadway segments. Therefore, Clatsop County does not provide regular contributions of funding to the City of Warrenton. Most of Clatsop County's roadway funding is allocated to improvement projects outside of the city limits of Astoria, Warrenton, Gearhart, Cannon Beach, and Seaside.

TABLE 6-1
City of Warrenton Existing Sources of Transportation Funds
Fiscal Years 1997/1998 to 2001/2002

	1997/1998 Actual	1998/1999 Actual	1999/2000 Actual	2000/2001 Actual	2001/2002 Actual
Beginning Fund Balance	**115,818**	**102,793**	**75,878**	**39,950**	**93,271**
Revenue Sources					
State Gas Tax Revenue	172,434	179,957	187,038	205,561	172,097
Miscellaneous Revenue	14,593	2,107	1,843	2,311	3,472
Other: Road District	44,067	45,038	5,478	3,167	1,681
Other: Grants	47,101				
Other: Transfer in				17,480	
Total Revenue	**278,195**	**227,102**	**194,359**	**228,519**	**177,250**
Expenditures					
Capital Outlays					
Street Improvements	186,339	162,315	85,421	76,021	2,441
Other: Maint/Admin	104,881	91,702	132,366	99,177	82,054
Transfers			12,500		
Total Expenditures	**291,220**	**254,017**	**230,287**	**175,198**	**84,495**
Ending Fund Balance	**102,793**	**75,878**	**39,950**	**93,271**	**186,026**

TABLE 6-2
City of Warrenton Projected Sources of Transportation Funds
Fiscal Years 2002/2003 to 2025

	2002/2003 Budget	2003/2004 Budget	2004/2005 Projected	2005-2010 Projected	2010-2015 Projected Budget	2015-2020 Projected Budget	2020-2025 Projected Budget
Beginning Fund Balance	**186,026**	**330,700**	**-**	**-**	**-**	**-**	**-**
Revenue Sources							
State Gas Tax Revenue	187,700	186,882	191,462	1,030,085	1,117,528	1,204,595	1,204,595
Miscellaneous Revenue	1,800	2,200	1,000	5,000	5,000	5,000	5,000
Other: Road District	700						
Total Revenue	**190,200**	**189,082**	**192,462**	**1,035,085**	**1,122,528**	**1,209,595**	**1,209,595**
Expenditures							
Capital Outlays							
Street Improvements	15,000	396,538	65,028	376,249	463,693	550,760	550,760
Other: Maint/Admin	30,526	123,244	127,434	658,835	658,835	658,835	658,835
Total Expenditures	**45,526**	**519,782**	**192,462**	**1,035,085**	**1,122,528**	**1,209,595**	**1,209,595**
Ending Fund Balance	**330,700**	**-**	**-**	**-**	**-**	**-**	**-**

State Funding Sources

In Oregon, STIP provides funding for capital improvements on Federal, State, County, and City transportation systems. Within the STIP, which is updated every 2 years, funds are allocated for multi-modal projects, including roadway, bicycle and pedestrian, transit, freight, and bridge projects. Each STIP lists projects that will be constructed during a 4-year period. Projects that are included in the STIP are regionally significant, because they have been given a high priority through planning efforts.

Transportation projects in the STIP generally are categorized in the following manner:

Modernization Projects: Improvements to accommodate existing traffic and/or projected traffic growth. These include:

- Addition of lanes: High Occupancy Vehicle (HOV) lanes, new alignments, and new facilities (bypasses)
- Highway reconstruction with major alignment improvements or major widening
- Grade separations
- Widening of bridges to add travel lanes
- Immediate Opportunity Fund (IOF) projects
- New safety rest areas

Safety Projects: An investment program focused on improvements to address priority hazardous highway locations and corridors, including the interstate, to reduce the number of fatal and serious injury crashes. Projects funded through this program meet strict benefit/cost criteria. They include:

- Capital improvements, such as passing lanes, turn lanes, and wider shoulders
- Access management
- New guardrails
- Illumination, delineation, or signing
- Channelization within the existing roadway at intersections
- Continuous shoulder rumble strips
- Enforcement of traffic laws
- Railroad crossing improvements (separate funding source)

Pavement Preservation: Improvements to rebuild or extend the service life of existing facilities, and rehabilitative work on roadways. Preservation projects add useful life to the road without increasing the capacity. They include:

- Pavement overlays (includes minor safety and bridge improvements)
- Interstate Maintenance (IM) Program (pavement preservation projects on the interstate system)
- Reconstruction to re-establish an existing roadway

- Resurfacing projects

Bridge Projects: Improvements to rebuild or extend the service life of existing bridges and structures beyond the scope of routine maintenance. They include:

- Rehabilitation, replacement, major repair, major maintenance
- Overpass screening
- Tunnels
- Large (more than 6-foot-wide) culverts

Operations: System management and improvements that lead to more efficient and safer traffic operations and greater system reliability. They include:

- Signals and signs, illumination, and other operational improvements
- Rockfalls and slides (chronic rockfall areas and slides; not emergency repair work)
- ITS (includes ramp metering, incident management, emergency response, traffic management operations centers, and mountain pass and urban traffic cameras)
- Slow-moving-vehicle turnouts, traffic circles or roundabouts
- TDM(includes rideshare, vanpool, and park and ride programs)

Oregon Transportation Investment Act

The Oregon Transportation Investment Act (OTIA) was passed by the 2001 Oregon Legislative Assembly and is funded through bond proceeds derived from increased DMV fees. OTIA currently provides $650 million (including $150 million local matching funds) for 173 construction projects that will improve pavement conditions, increase lane capacity, and improve bridges throughout Oregon. Projects were selected with extensive input from local communities and other stakeholders. In 2002, the Oregon Transportation Commission allocated these funds for modernization, preservation, and bridge projects throughout the State.

State-Funded Projects in Warrenton

Table 6-3 summarizes the expected STIP and OTIA funding for projects in the vicinity of Warrenton from 2002 to 2007 using the 2002-2005 STIP and Draft 2004-2007 STIP.

TABLE 6-3
STIP and OTIA Funding in Warrenton

Year	Bridge	Enhancement (Pedestrian and Bike)	Modernization	OTIA Preservation
2002			$2,766,000	
2003		$486,000		$576,000
2004				
2005				
2006				
2007	$5,621,000			

Source: 2002-2005 STIP, Draft 2004-2007 STIP.

As shown in Table 6-3, the Warrenton area is expected to receive $9,449,000 in STIP funding during the 6-year period. Projects included in Table 6-3 include repairs to the New Youngs Bay Bridge ($5,621,000), improvements at the US 101 and SE Marlin Avenue intersection ($2,766,000), the addition of sidewalks and bike lanes on East Harbor Drive (486,000), and an overlay preservation on Fort Stevens Highway 104 ($576,000). This amounts to more than $1.5 million/year from 2002 to 2007. Modernization and pedestrian/bicycle enhancement projects make up approximately 35 percent or over $3 million of this funding in the next six years.

Transportation System Plan Financing

Overall, the TSP contains over $30 million in multi-modal transportation improvements over the next twenty years, with the biggest improvements occurring on the primary state facilities serving the city of Warrenton. This plan assumes that existing revenues and expenditures for transportation maintenance and capital improvements over the next 20 years will remain stable. As a result, the city will likely need a combination of state and/or federal assistance in addition to additional local revenue to address funding needs. Table 6-4 summarizes timing and costs for projects listed in Section 5 under the categories of modernization, safety, and pedestrian/bicycle.

TABLE 6-4
Transportation System Plan Improvements Costs

	Priority				
Type of Improvement	**1-5**	**6-10**	**11-15**	**16-20**	**Total**
State Capacity	-	$5,600,000	$300,000	$1,000,000	$6,900,000[1]
State Safety	$2,800,000	$1,000,000	$250,000	$650,000	$4,700,000
Local Widening and Safety	$1,000	$2,800,000	$1,700,000	$3,600,000	$8,100,000
State Bike and Pedestrian	$491,000	$3,885,000	$925,000	-	$5,301,000
Local Bike and Pedestrian	$1,000,000	$968,000	$765,000	-	$2,733,000

[1]This total does not include improvements on the New Youngs Bay Bridge or existing sections of the Astoria-Warrenton Parkway.

Potential Future Funding Sources

U.S. Department of Transportation (USDOT) TEA-21 Reauthorization

The 2004 budget lays the groundwork for a $247 billion, six-year reauthorization proposal, as compared to TEA-21's current level of $218 billion. Of the proposed total, $195 billion would fund the highway program (up from $168 billion) over six years, and $45 billion would fund the transit program (up from $41 billion). Federal funding is typically distributed through the state.

U.S. Department of Homeland Security (DHS)

Several agencies formerly under the USDOT now reside in the DHS. Based on spending by various agencies and offices that have moved to DHS proposed funding for the $36 billion agency represents a 64 percent increase. The department's focus is on reducing the nation's vulnerability to terrorism, and minimizing the damage and recovering from attacks that may occur. Funding for projects that involve military operations and lifeline routes should be pursued through the DHS.

ODOT Bicycle and Pedestrian Program

The State-funded Bicycle and Pedestrian Program distributes approximately $3 million per year throughout the state. Many of the pedestrian and bicycle projects included in the TSP would be eligible for funding through this program. Therefore, Warrenton and ODOT should consider applying for these funds for pedestrian and bicycle projects included in the TSP.

System Development Charges

System Development Charges (SDC) create a mechanism for development to pay for transportation improvements necessary to support trips generated by development. SDCs are used in many cities and counties in Oregon and are generally based on the number of vehicle trips generated by the development.

Local Gas Tax

Warrenton currently receives a portion of state gas taxes. However, the city could implement an additional local gas tax to increase revenue and fund transportation related improvements. Local gas taxes are currently being utilized by several counties and cities within Oregon to fund transportation projects.

Road Pricing

As described in this TSP, tourism accounts for major increases in traffic volumes on state facilities within Warrenton. In coordination with the State, the city or Clatsop County could employ some form of tolling to support transportation related improvements. This concept is consider under the preferred alternative as a TDM measure to reduce reliance on the New Youngs Bay Bridge.

Revenue and General Obligation Bonds

Revenue bonds sold by government agencies and repaid by user charges. Typically, the bonds are secured by stable revenue stream, such as a local gas tax, street utility fee, or toll.

Similarly, general obligation bonds serve the same purpose however, they are secured by the full faith and credit of the issuing municipality. Such bonds are authorized by vote. Revenue bonds can also be issued with this backing.

Property Tax

The city could fund additional improvements through an increase in local property taxes.

Street Utility Fees

A street utility fee could be implemented by the City of Warrenton, which would assess a fee to businesses and households for use of streets based upon the traffic generated by a particular use. Street utility fees are generally collected for maintenance purposes.

Special Assessment/Local Improvement Districts (LIDs)

Special assessments are fees levied on property owners to fund local neighborhood facilities or services. These types of fees are generally collected for maintenance or street paving purposes. Special assessments are generally justified by demonstrating that maintenance or public works services enhance the value of a property and provide benefits to the owner.

Local Improvement Districts (LID) are established by local governments to administer or levy special assessments.

Parking Fees

Within the City of Warrenton, parking fees could be implemented within the downtown area to generate revenue for transportation related improvements.

SECTION 7

Transportation Planning Rule Consistency (OAR 660.012-0045)

In April 1991, the Land Conservation and Development Commission (LCDC), with the concurrence of ODOT, adopted the TPR, OAR 660 Division 12. Outlined below in Table 7-1 is a list of recommendations (designated by italics) and requirements for a Transportation System Plan and how each of those were addressed in the City of Warrenton TSP. The comparison demonstrates that the City of Warrenton TSP is in compliance with the provision of the TPR.

TABLE 7-1
TPR Requirements for a Transportation System Plan

TPR Requirements	City of Warrenton TSP Compliance
OAR 660-012-0015: Preparation and Coordination of the TSPs	
(3) Preparation, adoption, and amendment of Local TSPs	
(a) Local TSPs shall establish a system of transportation facilities and services adequate to meet identified local transportation needs and shall be consistent with adopted elements of regional and state TSPs.	**Sections 2 through 5** document the City of Warrenton's existing and future local transportation needs, **Section 6** contains the Warrenton **TSP, Section 5** provides a system of transportation facilities and services to meet these needs. These sections have been prepared in accordance with the Oregon TPR and the OHP.
(b) Coordinate the preparation of the local TSP to assure regional and state transportation needs are met.	All state transportation needs were considered in the development of the City of Warrenton TSP through the use of the PMT and various coordination meetings with affected agencies.
(4) Cities shall adopt regional and local TSPs as part of their comprehensive plan.	The County will adopt this TSP as part of its comprehensive plan.
(5) TSPs preparation shall be coordinated with affected state, federal, and regional agencies; local governments; special districts; and private providers of transportation services.	To ensure that the City of Warrenton TSP would be consistent with the policies, goals, and needs of affected agencies, the PMT was established at the outset of the planning process. The PMT was made up of public representatives from the City, plus ODOT, and Oregon Department of Land Conservation and Development.
OAR 660-012-0020: Elements of Transportation System Plans	
(1) Establish a coordinated network of facilities to serve state, regional, and local transportation needs.	All planned transportation facilities were coordinated with the identified needs of State and local agencies.
(2) The TSP shall include the following elements:	
(a) Determination of transportation needs per OAR 660-012-0030.	The City of Warrenton's 20-year transportation needs are **documented in Section 4** of this report.
(b) A road plan for a system of arterials and collectors and standards for the layout of local streets and connections.	The City of Warrenton roadway plan is documented in **Section 5**, and illustrated in Figure 5-2.

TABLE 7-1
TPR Requirements for a Transportation System Plan

TPR Requirements	City of Warrenton TSP Compliance
(c) A public transportation plan.	The City of Warrenton Transit Plan is documented in **Section 5**.
(d) A bicycle and pedestrian plan consistent with ORS 365.514.	The City of Warrenton Pedestrian Plan is documented in **Section 5**. The City of Warrenton Bicycle Plan is documented in **Section 5**, and illustrated in Figure5-7.
(e) An air, rail, water, and pipeline plan that identifies public use airports, mainline and branchline railroads, port facilities, and major regional pipelines and terminals.	The air, rail, water, and pipeline system plans are documented in **Section 5** and illustrated in Figure 2-12.
(h) Policies and land use regulation for TSP implementation per OAR 660-012-0045.	These will be adopted separately from the TSP.
(i) For areas within an urban growth boundary containing a population of 2500 or more , a transportation financing program as provided in OAR660-12-0040	The transportation financing program is documented in **Section 6**.
(3) Each element identified in (2)(b)-(d) shall contain:	
(a) An inventory and assessment of existing and committed facilities and services by function, type, capacity, and condition.	An inventory of Warrenton's existing transportation facilities is documented in **Section 2** of this plan.
(b) A system of planned facilities, services, and major improvements.	A system of planned facilities, services, and major improvements is documented in **Section 5** of this plan.
(c) A description of planned facilities, services, and major improvements including a map showing general location of proposed improvements, minimum and maximum right-or-way widths, and a description of facility or service.	**Section 5** of this plan contains a description of Warrenton's planned facilities, services, and major improvements. A map showing the general location of the proposed improvements is provided for in Figure 4-10. Right-of-way widths are illustrated in Figures 5-3, 5-4 and 5-5. A description of each facility type is provided in Tables 5-1, 5-2, 5-4, and 5-5.
(d) Identification of the provider of each facility or service.	The responsible agency/provider of each facility is documented in **Section 2**.
OAR 660-012-0025: Complying with the Goals in TSP Preparation	
(1) Adoption of a TSP shall constitute the land use decision regarding the need for transportation facilities services, and major improvements and their function, mode, and general location.	In process.
(2) Findings of compliance with applicable statewide planning goals and comprehensive plan policies shall be developed in conjunction with adoption of the TSP.	In process.
OAR 660-012-0030: Determination of Transportation Needs	
(1) The TSP shall identify transportation needs including:	
(a) State and local transportation needs;	The State and local transportation needs are documented in **Section 3** of this plan.
(b) Needs of the transportation disadvantaged;	The needs of the transportation disadvantages are documented in **Section 3** of this plan.

TABLE 7-1
TPR Requirements for a Transportation System Plan

TPR Requirements	City of Warrenton TSP Compliance
(c) Needs for the movement of goods and services.	The needs for the movement of goods and services are documented in **Section 3** of this plan.
OAR 660-012-0035: Evaluation and Selection of Transportation System Alternatives	
(1) The TSP shall be based upon evaluation of potential impacts of system alternatives that can reasonably be expected to meet the identified needs at reasonable cost. The following shall be evaluated as components of the system alternatives:	
(a) Improvements to existing facilities or services;	Reasonable and cost effective solutions to existing facilities were evaluated before new facilities were considered.
(b) New facilities and services including different modes of travel;	All new facilities were evaluated based on their reasonableness and cost-effectiveness.
(c) Transportation system management measures;	Transportation system management strategies were anticipated in the development of TSP.
(d) Demand management measures;	Demand management measures were addressed in the development of the preferred alternative in Section 5.
(e) A no-build system alternative required by the national EPA.	**Section 4**, Alternative 1 documents the "no-build" system alternative and its inadequacies to meet the future transportation needs of Warrenton.
(3) The following standards shall be used to evaluate and select alternatives:	
(a) The transportation system shall support urban and rural development by providing types and levels of facilities and services appropriate to serve the land uses identified in the acknowledged comprehensive plan;	The TSP is based on the current, acknowledged comprehensive plan for City of Warrenton and provides enhancement to the integration of transportation and land use systems.
(b) The transportation system shall be consistent with state and federal standards for the protection of air, land and water quality;	The standards used to evaluate and select transportation alternatives are documented in **Sections 4 and 5** of this plan.
(c) The transportation system plan shall minimize adverse economic, social, environmental, and energy consequences;	The standards used to evaluate and select transportation alternatives are documented in **Sections 4 and 5** of this plan.
(d) The transportation system shall minimize conflicts and facilitate connections between modes of transportation.	The standards used to evaluate and select transportation alternatives are documented in **Section 4** of this plan.
(e) The transportation system plan shall avoid principal reliance of any one mode of transportation and reduce principal reliance on the automobile.	The standards used to evaluate and select transportation alternatives are documented in **Section 4** of this plan.
(7) Local TSPs shall include interim benchmarks to assure satisfactory progress towards meeting the requirements of this chapter at five-year intervals. Local governments shall evaluate progress in meeting interim benchmarks at five year intervals from adoption of the TSP.	The City of Warrenton will evaluate progress toward meeting the requirements of the TPR through regular review of the existing City's adopted TSP at five-year intervals.

TABLE 7-1
TPR Requirements for a Transportation System Plan

TPR Requirements	City of Warrenton TSP Compliance
OAR 660-012-0040: Transportation Financing Program	
(1) For areas within an urban growth boundary containing a population greater than 2,500 persons, the TSP shall include a transportation-financing program.	The City of Warrenton Transportation Funding Plan is documented in **Section 6** of this plan.
(2) A Transportation financing program shall include the items listed in (a)—(d):	
(a) A list of planned transportation facilities and major improvements;	A list of planned transportation facilities and major improvements is provided in **Section** 5 and Appendix A.
(b) A general estimate of the timing for planned facilities and major improvements;	**Section 6**, and Appendix A lists the planned transportation facilities and major improvements in the 0-5, 6-10, and 11-20 year time frames.
(c) A determination of rough cost estimates for the facilities and major improvements identified in the TSP;	**Section 6**, and Appendix A lists the rough cost estimates for each planned transportation facility and major improvement in the zero- to 5-, 6- to 10-, and 11- to 20-year time frames.
(3) The financing plan shall include a discussion of the facility provider's existing funding mechanisms to fund the development of each facility and major improvement.	Documentation of Oregon and the City of Warrenton's existing funding mechanisms are provided in **Section 6** of the plan.
(5) The financing program shall provide for phasing of major improvements to encourage infill and redevelopment of urban lands prior to premature development of urbanizing or rural lands.	Investment in transportation improvements has been prioritized to encourage development of downtown Warrenton.

Implementing Ordinances

This section of the TSP presents recommended changes to the Warrenton Development Code ("WDC") in order to comply with implementation provisions of the Oregon Transportation Planning Rule ("TPR") as codified in OAR 660-012-045. AEA performed a "TPR code audit" that served as the guide for identifying sections of the code that needed revisions or additions.

The discussion of recommended changes is generally organized by referencing the applicable section(s) of the TPR that prompt a change in the Warrenton Development Code, followed by the recommended revisions. Revisions are presented with deletions shown ~~strikethrough~~ and additions shown underlined. AEA developed new code language to meet TPR requirements given the existing conditions and regulatory framework in Warrenton. In addition, AEA utilized the Model Transportation Planning Rule Ordinances and Policies for Small Jurisdictions and the Model Development Code & Users Guide for Small Jurisdictions as reference documents for recommended code revisions. Only areas of OAR 660-12-0045 that are not in compliance with in the Warrenton Development Code will be addressed in this section of the TSP.

Definitions

New definitions are needed to support the amendments and updates to WDC chapters that bring it into compliance with the TPR. The definitions listed below are recommended for inclusion in Chapter 1.3, *Definitions*. Additionally, the definition for Transportation facilities and Improvements has been amended to be more specific.

Bicycle - A vehicle designed to operate on the ground on wheels, propelled solely by human power, upon which persons or person may ride and with two tandem wheels of at least 4 inches in diameter

Bicycle facilities - A general term denoting improvements and provisions made to accommodate or encourage bicycling, including parking facilities and all bikeways.

Bikeway - Any road, path or way that is in some manner specifically open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are shared with other transportation modes. The five types of bikeways are:

a. Multi-use Path. A paved way (typically 10 to 12-feet wide) that is physically separated from motorized vehicular traffic; typically shared with pedestrians, skaters, and other non-motorized users.

b. Bike Lane. A portion of the roadway (typically 4 to 6-feet wide) that has been designated by permanent striping and pavement markings for the exclusive use of bicycles.

c. Shoulder Bikeway. The paved shoulder of a roadway that is 4 feet or wider; typically shared with pedestrians in rural areas.

d. Shared Roadway. A travel lane that is shared by bicyclists and motor vehicles.

e. Multi-use Trail. An unpaved path that accommodates all-terrain bicycles; typically shared with pedestrians.

Corner clearance - The distance from an intersection of a public or private street to the nearest driveway or other access connection, measured from the closest edge of the pavement of the intersecting street to the closest edge of the pavement of the connection along the traveled way.

Cross Access - A service drive providing vehicular access between two or more contiguous sites so the driver need not enter the public street system.

Lot Depth. The average distance measured from the front lot line to the rear lot line.

Pedestrian Facilities - Improvements and provisions made to accommodate or encourage walking, including sidewalks, accessways, crosswalks, ramps, paths, and trails.

Transportation facilities and improvements - The physical improvements used to move people and goods from one place to another; i.e., streets, sidewalks, pathways, bike lanes, airports, transit stations and bus stops, etc.). Transportation improvements include the following:

a. Normal operation, maintenance, repair, and preservation activities of existing transportation facilities.

b. Installation of culverts, pathways, medians, fencing, guardrails, lighting, and similar types of improvements within the existing right-of-way.

c. Projects specifically identified in the City's adopted Transportation System Plan as not requiring further land use review and approval.

d. Landscaping as part of a transportation facility.

e. Emergency measures necessary for the safety and protection of property.

f. Construction of a street or road as part of an approved subdivision or partition.

g. Construction, reconstruction, or widening of highways, roads or bridges, or other transportation projects that are not designated improvements in the Transportation System Plan.

h. Construction, reconstruction, or widening of highways, roads or bridges, or other transportation projects that are not designed and constructed as part of an approved subdivision or partition.

Transportation Facilities and Improvements in Subsections g. and h. require a Conditional Use Permit (CU) under Chapter 4.4.

660-012-0045
Implementation of the Transportation System Plan
(1) Each local government shall amend its land use regulations to implement the TSP.
(a) The following transportation facilities, services and improvements need not be subject to land use regulations except as necessary to implement the TSP and, under ordinary circumstances do not have a significant impact on land use:
(A) Operation, maintenance, and repair of existing transportation facilities identified in the TSP, such as road, bicycle, pedestrian, port, airport and rail facilities, and major regional pipelines and terminals;
(B) Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, where the improvements are consistent with clear and objective dimensional standards;
(C) Uses permitted outright under ORS 215.213(1)(m) through (p) and ORS 215.283(1)(k) through (n), consistent with the provisions of 660-012-0065; and
(D) Changes in the frequency of transit, rail and airport services.

Several sections of the WDC should be modified related to this rule requirement. Because few of the Warrenton's land use districts allow transportation facilities and improvements outright; a series of revisions are recommended to enable the development of these facilities within land use districts. Transportation facilities include public improvements for streets, transit, parking and bicycle and pedestrian facilities. Because many revisions are required, the recommended changes to the permitted use sections of the code are presented here in tabular format. In the amended ordinance, these will be included in the permitted use list for the relevant section. The definition for transportation facilities and improvements will be added to the Section WDC Definitions section.

Code Section	District	Permitted Uses
2.1	Rural Development District (RD)	Transportation facilities and improvements[1]
2.2	Low Density Residential (R-40)	Transportation facilities and improvements[1],
2.3	Intermediate Density Residential District (R-10)	Transportation facilities and improvements[1]
2.4	Medium Density Residential District (R-M)	Transportation facilities and improvements[1]
2.5	High Density Residential District (R-H)	Transportation facilities and improvements[1]
2.6	General Commercial District (C-1)	Transportation facilities and improvements[1]
2.7	Commercial Mixed-Use District (C-MU)	Transportation facilities and improvements[1]
2.8	Marine Commercial District (C-2)	Land Transportation facilities and improvements[1]
2.9	Open Space and Institutional District (OSI)	Transportation facilities and improvements[1]
2.10	Recreational Commercial District (R-C)	Transportation facilities and improvements[1]
2.11	General Industrial District (I-1)	Transportation facilities and improvements[1]
2.12	Water Dependent Industrial	Land Transportation facilities and

Code Section	District	Permitted Uses
	Shorelands District (I-2)	improvements[1]
2.13	Urban Recreational/Resort District (URR)	Transportation facilities and improvements[1]
2.19	Airport Hazard Overlay District (AHO)	Transportation facilities and improvements[1]
2.21	Beaches and Dunes Overlay District (BDO)	Transportation (vehicular) facilities and improvements as identified in the TSP (permitted only as a **conditional use** subject to required goal findings or goal exception)[1]

[1]Transportation facilities and improvements permitted outright - The physical improvements used to move people and goods from one place to another; i.e., streets, sidewalks, pathways, bike lanes, airports, transit stations and bus stops, etc.). Transportation improvements include the following:

- Normal operation, maintenance, repair, and preservation activities of existing transportation facilities.
- Installation of culverts, pathways, medians, fencing, guardrails, lighting, and similar types of improvements within the existing right-of-way.
- Projects specifically identified in the City's adopted Transportation System Plan as not requiring further land use review and approval.
- Landscaping as part of a transportation facility.
- Emergency measures necessary for the safety and protection of property.
- Construction of a street or road as part of an approved subdivision or partition.

NOTE: Construction, reconstruction, or widening of highways, roads, bridges or other transportation facilities that are (1) not designated in the City's adopted Transportation System Plan ("TSP"), or (2) not designed and constructed as part of an approved subdivision or partition, or (3) not located within an existing public right-of-way, are allowed in all Districts subject to a Conditional Use Permit and satisfaction of the conditional use criteria of Section 4.4.3 .

OAR 660-12-0045
(1)(b) To the extent, if any, that a transportation facility, service or improvement concerns the application of a comprehensive plan provision or land use regulation, it may be allowed without further land use review if it is permitted outright or if it is subject to standards that do not require interpretation or the exercise of factual, policy or legal judgment;

To address this portion of the TPR, transportation facilities and improvements *that are not part of the City's TSP and are* ***not*** *part of a subdivision or partition subject to site design review* should be allowed in all districts as *conditional uses*. It is recommended that a new subsection 4.4.3(2), *Transportation Facilities and Improvements* be added to Section 4.4.3 *Basic Criteria* in Chapter 4.4 *Conditional Use Permits.*

Discussion Point: Non-transportation-related Conditional Use permits expire after two years. Should transportation-related CUP's also expire after two years or three years?

4.4.3 Basic Conditional Use Review Criteria

(1) Before a conditional use is approved findings will be made that the use will comply with the following standards:

a.~~(1)~~ The proposed use is in conformance with the Comprehensive Plan.

b.~~(2)~~ The location, size, design and operating characteristics of the proposed use are such that the development will be compatible with, and have a minimal impact on, surrounding properties.

c.~~(3)~~ The use will not generate excessive traffic, when compared to traffic generated by uses permitted outright, and adjacent streets have the capacity to accommodate the traffic generated.

d.~~(4)~~ Public facilities and services are adequate to accommodate the proposed use.

e.~~(5)~~ The site's physical characteristics, in terms of topography, soils and other pertinent considerations, are appropriate for the use.

f.~~(6)~~ The site has an adequate area to accommodate the proposed use. The site layout has been designed to provide for appropriate access points, on-site drives, public areas, loading areas, storage facilities, setbacks and buffers, utilities or other facilities which are required by City ordinances or desired by the applicant.

(2) Transportation System Facilities and Improvements.

a. Construction, reconstruction, or widening of highways, roads, bridges or other transportation facilities that are (1) not designated in the City's adopted Transportation System Plan ("TSP"), or (2) not designed and constructed as part of an approved subdivision or partition, or (3) not located within an existing public right-of-way, are allowed in all Districts subject to a Conditional Use Permit and satisfaction of all of the following criteria:

1. The project and its design are consistent with the City's adopted TSP, or, if the City has not adopted a TSP, consistent with the State Transportation Planning Rule, OAR 660-012 ("the TPR").

2. The project design is compatible with abutting land uses in regard to noise generation and public safety and is consistent with the applicable zoning and development standards and criteria for the abutting properties.

3. The project design minimizes environmental impacts to identified wetlands, wildlife habitat, air and water quality, cultural resources, and scenic qualities, and a site with fewer environmental impacts is not reasonably available. The applicant shall document all efforts to obtain a site with fewer environmental impacts, and the reasons alternative sites were not chosen.

4. The project preserves or improves the safety and function of the facility through access management, traffic calming, or other design features.

5. The project includes provisions for bicycle and pedestrian access and circulation consistent with the comprehensive plan, the requirements of this ordinance, and the TSP or TPR.

b. State transportation system facility or improvement projects. The State Department of Transportation ("ODOT") shall provide a narrative statement with the application demonstrating compliance with all of the criteria and standards in Section 4.4.3.(2).a (2-5). Where applicable, an Environmental Impact Statement or Environmental Assessment may be used to address one or more of these criteria.

c. Proposal inconsistent with TSP/TPR. If the City determines that the proposed use or activity or its design is inconsistent with the TSP or TPR, then the applicant shall apply for and obtain a plan and/or zoning amendment prior to or in conjunction with conditional use permit approval. The applicant shall choose one of the following options:

1. If the City's determination of inconsistency is made prior to a final decision on the conditional use permit application, the applicant shall withdraw the conditional use permit application; or

2. If the City's determination of inconsistency is made prior to a final decision on the conditional use permit application, the applicant shall withdraw the conditional permit application, apply for a plan/zone amendment, and re-apply for a conditional use permit if and when the amendment is approved; or

3. If the City's determination of inconsistency is made prior to a final decision on the conditional use permit application, the applicant shall submit a plan/zoning amendment application for joint review and decision with the conditional use permit application, along with a written waiver of the ORS 227.178 120-day period within which to complete all local reviews and appeals once the application is deemed complete; or

4. If the City's determination of inconsistency is part of a final decision on the conditional use permit application, the applicant shall submit a new conditional use permit application, along with a plan/zoning amendment application for joint review and decision.

d. Expiration. A Conditional Use Permit for Transportation System Facilities and Improvements shall be void after two years.

OAR 660-12-0045
(1)(c) In the event that a transportation facility, service or improvement is determined to have a significant impact on land use or to concern the application of a comprehensive plan or land use regulation and to be subject to standards that require interpretation or the exercise of factual, policy or legal judgment, the local government shall provide a review and approval process that is consistent with 660-012-0050. To facilitate implementation of the TSP, each local government shall amend its land use regulations to provide for consolidated review of land use decisions required to permit a transportation project.

To comply with the above TPR requirement, the following provisions for noticing ODOT should be added to the procedures in the following sections: Table 4.1.2, *Summary of Development Decisions and Permit by Type of Decision-Making Procedure,* Chapter 4.1.4 Subsection C.1.e, *Type II Procedure – Notice of Application.*

Table 4.1.2 Summary of Development Decisions and Permit by Type of Decision-Making Procedure

It is recommended that asterisks be added to the following permit types in this table to call out that they require notice to ODOT:

Annexation*	Large-Scale Development*
Access*	Manufactured Dwelling Park*
Appeal*	Modification to Approval*
Code Amendment*	Right-of-Way Development/Use Permit*
Comprehensive Plan Amendment*	Site Design Review*
Conditional Use Permit*	Subdivision (Preliminary Plat)*
Demolition Permit*	Temporary Use Permit*
Grading Permit*	Vacation (Street)*
Home Occupation Permit*	Variance*
Land Use District Map Amendment (Quasi-Judicial)*	Wireless Communication Facility (WCF) Permit*
Land Use District Map Amendment (Legislative)*	Zoning Map Amendment (see Land Use District Map)*

The note at the bottom of the table shall read:
*The City shall send ODOT notice of all applications noted with an asterisk.

4.1.4 Type II Procedure (Administrative)

C. Notice of Application for Type II Administrative Decision.

1. Before making a Type II Administrative Decision, the zoning administrator shall mail notice to:

   a. All owners of record of real property within 100 feet of the subject site;

b. A newspaper of general circulation in the City of Warrenton for publication not less than 14 days prior to the decision date.

c. All City-recognized neighborhood groups or associations whose boundaries include the site;

d. Any person who submits a written request to receive a notice; and

e. Any governmental agency which is entitled to notice under an intergovernmental agreement entered into with the City. The City may notify other affected agencies, as appropriate, for review of the application. ODOT shall be notified when there is a land division abutting a State facility for review of, comment on, and suggestion of conditions of approval for, the application.

OAR 660-012-0045
(2) Local governments shall adopt land use or subdivision ordinance regulations, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions. Such regulations shall include:
(a) Access control measures, for example, driveway and public road spacing, median control and signal spacing standards, which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;

(6) In developing a bicycle and pedestrian circulation plan as required by 660-012-0020(2)(d), local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas. Appropriate improvements should provide for more direct, convenient and safer bicycle or pedestrian travel within and between residential areas and neighborhood activity centers (i.e., schools, shopping, transit stops). Specific measures include, for example, constructing walkways between cul-de-sacs and adjacent roads, providing walkways between buildings, and providing direct access between adjacent uses.

The access management section of the WDC is fairly complete and needs few revisions. Minor amendments are recommended for Chapter 3.1, *Access and Circulation* and Chapter 3.5.1 *Transportation Standards*, as well as Section 5.2.100, *Non-Conforming Development*.

3.1.2 Vehicular Access and Circulation.

A. **Intent and Purpose.** The intent of this Section is to manage vehicle access to development through a connected street system, while preserving the flow of traffic in terms of safety, roadway capacity, and efficiency. Access shall be managed to maintain an adequate ~~"level of service"~~ performance standards and to maintain the "functional classification" of roadways as required by the Warrenton Comprehensive Plan and/or Transportation System Plan. Major roadways, including highways, arterials, and collectors, serve as the primary system for moving people and goods. "Access management" is a primary concern on these roads. Local streets and alleys provide access to individual properties. If vehicular access and circulation are not properly designed, these roadways will be unable to accommodate the needs of development and serve their transportation function. This Section attempts to balance the right of reasonable access to private property

with the right of the citizens of the City and the State of Oregon to safe and efficient travel. It also requires all developments to construct planned streets (arterials and collectors) and to extend local streets.

To achieve this policy intent, state and local roadways have been categorized in the Comprehensive Plan by function. ~~and classified for access purposes based upon their level of importance and function. (See Section 3.5)~~ Regulations have been applied to these roadways for the purpose of reducing traffic accidents, personal injury, and property damage attributable to access systems, and to thereby improve the safety and operation of the roadway network. This will protect the substantial public investment in the existing transportation system and reduce the need for expensive remedial measures. These regulations also further the orderly layout and use of land, protect community character, and conserve natural resources by promoting well-designed road and access systems and discouraging the unplanned subdivision and development of land.

E. **Conditions of Approval.** The City or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system. The City shall not permit, except for single family dwellings, accesses that require backing up a vehicle either into a public street from off-street parking or from a public street into off-street parking. ~~Access to and from off-street parking areas shall not permit backing onto a public street~~.

G. **Access Spacing.** Driveway accesses shall be separated from other driveways and street intersections in accordance with the following standards and procedures:

4. Corner Clearance. The distance from a street intersection to a driveway or other street access shall meet or exceed the minimum spacing requirements for the street classification in the Warrenton TSP.

I. **Shared Driveways.** The number of driveway and private street intersections with public streets shall be minimized by the use of shared driveways with adjoining lots where feasible. The City shall require shared driveways as a condition of land division or site design review, as applicable, for traffic safety and access management purposes in accordance with the following standards:

4. Cross Access. Cross access in encouraged, and may be required, between contiguous sites in Commercial (C-1, C-MU, C2, R-C) and Industrial (I-1, I-2) Districts and for multi-family housing in Residential Multi-family Districts (R-M, R-H), in order to provide for more direct circulation between sites and uses for pedestrians, bicyclists and drivers.

K. **Driveway Openings.** Driveway openings (or curb cuts) shall be the minimum width necessary to provide the required number of vehicle travel lanes (10 feet for each travel lane). The following standards (i.e., as measured where the front property line meets the sidewalk or right-of-way) are required to provide adequate site access, minimize surface water runoff, and avoid conflicts between vehicles and pedestrians:

7. Driveway Approaches. Driveway approaches should be designed and located to provide an existing vehicle with an unobstructed view. Construction of driveways along acceleration or deceleration lanes or tapers should be avoided due to potential for vehicle conflicts.

8. Loading area design. The design of driveways and on-site maneuvering and loading areas for commercial and industrial developments shall consider the anticipated storage length for entering and existing vehicles, in order to prevent vehicles from backing into the flow of traffic on the public street or causing unsafe conflicts with on-site circulation.

3.5.1 Transportation Standards

G. Traffic Signals. Traffic signals shall be required with development when traffic signal warrants are met, in conformance with the Highway Capacity Manual, and Manual of Uniform Traffic Control Devices. The location of traffic signals shall be noted on approved street plans. Where a proposed street intersection will result in an immediate need for a traffic signal, a signal meeting approved specifications shall be installed. The developer's cost and the timing of improvements shall be included as a condition of development approval. Traffic signals on roads under state jurisdiction shall be determined by the Oregon Department of Transportation.

5.2.100 Non-Conforming Uses or Structures

A non-conforming use or structure was a lawful existing structure or use at the time this Code became effective, but which does not conform to some or all of the requirements of this Code.

(1) Continuation: a non-conforming use or structure may be continued.

(2) Expansion, or extension: In case of practical difficulty and unnecessary hardship, the Planning Commission may grant a variance for the enlargement or expansion of a non-conforming use up to 25% in floor or 10% in land area as was existing on the effective date of this ordinance. For non-conforming industrial uses or structures, the Planning Commission may grant a variance for enlargement or expansion up to a size approved by the Planning Commission. The extension of a non-conforming use to a portion of a structure which was arranged or designed for the non-conforming use at the time of passage of this ordinance is not an enlargement or expansion of a non-conforming use.

(3) Alteration: A non-conforming structure that conforms with respect to use may be altered or extended if the alteration or extension does not cause the structure to deviate further from the standards of this Code.

(4) Discontinuance: If a non-conforming use is discontinued for a period of twelve months, further use of the property shall conform to this Code.

(5) Replacement: If a non-conforming use involving a structure is replaced by another use, the new use shall conform to this Code unless the Planning Commission determines that such structure is suitable only for another non-conforming use no more detrimental to surrounding properties than the one to be replaced.

(6) Damage: If a non-conforming structure, or a structure containing a non-conforming use, is damaged by any cause, it may continue if damage is limited to no more than 75% of its fair market value (as indicated by the County Assessor's records), and if a building permit for repair is issued within one year of the damage event. If these conditions are not met, any subsequent structure or use of the site shall conform to this Code.

(7) Time Limitation: Nothing contained in this Code shall require any change in the plans, construction, alteration or designated use of a structure for which a permit had been issued by the City and construction had commenced prior to the adoption of this Code, provided the structure, if non-conforming or intended for a non-conforming use, is completed and is in use within two years from the time the permit is issued.

(8) Non-conforming street Access Connections that exist prior to *(DATE OF ADOPTION)* that do not conform with the standards in Chapter 3.1 shall be brought into compliance when the following conditions exist.

1. When a new access connection permit is requested for the subject property; or
2. When a building permit or land use application is submitted that results in an increase of trip generation by 20% and 100 average daily trips (ADT).

OAR 660-12-045
(2)(b) Local governments shall adopt ...Standards to protect future operation of roads, transit ways and major transit corridors;
(2)(e) Local governments shall adopt ...A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors and sites.

This section addresses the need to look at potential development impacts on roadways and transit corridors and to ensure that they continue to meet community needs. In addition to coordination with affected agencies, access management, and adherence to road design standards, requiring traffic impact studies in certain cases is one way to meet this part of the rule.

The addition of a new procedural section is recommended for the WDC, called Chapter 4.13 - *Traffic Impact Study* which outlines when a TIS is required and how one is executed. This section would be codified at the end of Chapter 4, *Applications and Review Procedures.*

4.13 Traffic Impact Study

A. **Purpose.** The purpose of this section of the Warrenton Development Code is to implement Section 660-012-0045 (2) (e) of the State Transportation Planning Rule that requires the City to adopt a process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities. This Chapter establishes the standards for when a proposal must be reviewed for potential traffic impacts; when a Traffic Impact Study must be submitted with a development application in order to determine whether conditions are needed to minimize impacts to and protect transportation facilities; what must be in a Traffic Impact Study; and who is qualified to prepare the Study.

B. **Typical Average Daily Trips.** Standards by which to gauge average daily vehicle trips include: 10 trips per day per single family household, 5 trips per day per apartment; and 30 trips per day per 1,000 square feet of gross floor area such a new supermarket or other retail development.

C. **When Required.** A Traffic Impact Study may be required to be submitted to the City with a land use application, when the following conditions apply:

1. The development application involves a change in zoning or a plan amendment designation; or,

2. The development shall cause one or more of the following effects, which can be determined by field counts, site observation, traffic impact analysis or study, field measurements, crash history, Institute of Transportation Engineers Trip Generation manual; and information and studies provided by the local reviewing jurisdiction and/or ODOT:

a. An increase in site traffic volume generation by 300 Average Daily Trips (ADT) or more; or

b. An increase in ADT hour volume of a particular movement to and from the State highway by 20 percent or more; or

c. An increase in use of adjacent streets by vehicles exceeding the 20,000 pound gross vehicle weights by 10 vehicles or more per day; or

d. The location of the access driveway does not meet minimum site distance requirements, or is located where vehicles entering or leaving the property are restricted, or such vehicles queue or hesitate on the State highway, creating a safety hazard; or

e. A change in internal traffic patterns that may cause safety problems, such as back up onto the highway or traffic crashes in the approach area.

D. **Traffic Impact Study Requirements.**

1. Preparation. A Traffic Impact Study shall be prepared by a professional engineer in accordance with OAR 734-051-180.

2. Transportation Planning Rule Compliance, Section 4.7.6.

E. **Approval Criteria.**

1. Criteria. When a Traffic Impact Study is required, approval of the development proposal requires satisfaction of the following criteria:

a. The Traffic Impact Study was prepared by a professional engineer in accordance with OAR 734-051-180; and

b. If the proposed development shall cause one or more of the effects in Section 4.1.3.C.2 (a-e) above, or other traffic hazard or negative impact to a transportation facility, the Traffic Impact Study includes mitigation measures satisfactory to the City Engineer, and ODOT when applicable; and

c. The proposed site design and traffic and circulation design and facilities, for all transportation modes, including any mitigation measures, are designed to:

(1) Have the least negative impact on all applicable transportation facilities; and
(2) Accommodate and encourage non-motor vehicular modes of transportation to the extent practicable; and

(3) Make the most efficient use of land and public facilities as practicable; and
(4) Provide the most direct, safe and convenient routes practicable between on-site destinations, and between on-site and off-site destinations; and
(5) Otherwise comply with applicable requirements of the City of Warrenton Development Code.

2. Conditions of Approval. The City may deny, approve, or approve the proposal with appropriate conditions.

OAR 660-12-0045
(2)(d) Local governments shall adopt...A process for Coordinated review of future land use decisions affecting transportation facilities, corridors, or sites.

To comply with the above TPR requirement, it is recommended that Chapter 4.1.7 Subsection D.3.b, *General Provisions - Applications – Completeness* be amended to require coordinated review of land use applications which affect transportation facilities. .

4.1.7 General Provisions

D. Applications

3. Check for acceptance and completeness
b. Completeness.
(1) Review and notification. After the application is accepted, the zoning administrator shall review the application for completeness. If the application is incomplete, the zoning administrator shall notify the applicant in writing of exactly what information is missing within 30 days of receipt of the application and allow the applicant 180 days to submit the missing information;
(2) When application deemed complete for review. In accordance with the application submittal requirements of this chapter, the application shall be deemed complete upon the receipt by the zoning administrator of all required information. The applicant shall have the option of withdrawing the application, or refusing to submit information requested by the planning official in (1), above. For the refusal to be valid, the refusal shall be made in writing and received by the zoning administrator no later than 14 days after the date on the planning official's letter of incompleteness. If the applicant refuses in writing to submit the missing information, the application shall be deemed complete on 31st day after the zoning administrator or its designee first accepted the application.
(3) Standards and criteria that apply to the application. Approval or denial of the application shall be based upon the standards and criteria that were applicable at the time the application was first accepted.
(4) Coordinated Review. When required by this Code, or at the direction of the zoning administrator, the City shall also submit the application for review and comment to ODOT and other applicable City, County, State, and federal review agencies.

ORA 660-12-045
(2)(g) Local governments must adopt...Regulations assuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities and levels of service of facilities identified in the TSP.

The above TPR regulation ensures that amendments to the Comprehensive Plan and land use regulations are reviewed for their impact on transportation facilities identified in the TSP. To comply with the Rule, it is recommended that the pending language in Chapter 4.7.6, *Transportation Planning Rule Compliance* be adopted as part of Chapter 4, *Applications and Procedure Types.*

4.7.6 Transportation Planning Rule Compliance.

A. When a development application includes a proposed comprehensive plan amendment or land use district change, the proposal shall be reviewed to determine whether it significantly affects a transportation facility, in accordance with Oregon Administrative Rule (OAR) 660-012-0060. Significant means the proposal would:

1. Change the functional classification of an existing or planned transportation facility. This would occur, for example, when a proposal causes future traffic to exceed the capacity of "collector" street classification, requiring a change in the classification to an "arterial" street, as identified by the Transportation System Plan, or

2. Change the standards implementing a functional classification system; or

3. Allow types or levels of land use that would result in levels of travel or access what are inconsistent with the functional classification of a transportation facility; or

4. Reduce the level of service of the facility below the minimum acceptable level identified in the Transportation System Plan.

B. Amendments to the comprehensive plan and land use standards which significantly affect a transportation facility shall assure that allowed land uses are consistent with the function, capacity, and level of service of the facility identified in the Transportation System Plan. This shall be accomplished by one of the following:

1. Limiting allowed land uses to be consistent with the planned function of the transportation facility; or

2. Amending the Transportation System Plan to ensure that existing, improved, or new transportation facilities are adequate to support the proposed land uses consistent with the requirement of the Transportation Planning Rule; or,

3. Altering land use designations, densities, or design requirements to reduce demand for automobile travel and meet travel needs through other modes of transportation.

OAR 660-12-045
(3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth below. The purposes of this section are to provide for safe and convenient pedestrian, bicycle and vehicular circulation consistent with access management standards and the function of affected streets, to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel in areas where pedestrian and bicycle travel is likely if connections are provided, and which avoids wherever possible levels of automobile traffic which might interfere with or discourage pedestrian or bicycle travel.
(a) Bicycle parking facilities as part of new multi-family residential developments of four units or more, new retail, office and institutional developments, and all transit transfer stations and park-and-ride lots.

In order for walking and bicycling to be viable forms of transportation, especially in smaller cities, the proper facilities must be supplied. In addition, certain development patterns, such as building orientation, bicycle parking and parking lot location contribute to a more pedestrian and bicycle friendly environment. In regard to bicycle parking, it is recommended that the City amend Chapter 3.3.4 in order to ensure that adequate bicycle parking is provided in Warrenton when development occurs.

3.3.4 Bicycle Parking Requirements.

All uses shall provide bicycle parking, in conformance with the following standards, which are evaluated during the development or site design review:

A. **Number of Bicycle Parking Spaces.** A minimum of 2 bicycle parking spaces per use is required for all uses with more than 10 vehicle-parking spaces. The following additional standards apply to specific types of development:

1. Multi-Family Residences. Every residential use of four (4) or more dwelling units provides at least one sheltered bicycle parking space for each dwelling unit. Sheltered bicycle parking spaces may be located within a garage, storage shed, basement, utility room or similar area. In those instances in which the residential complex has no garage or other easily accessible storage unit, the bicycle parking spaces may be sheltered from sun and precipitation under an eave, overhang, an independent structure, or similar cover.

2. Parking Lots. All public and commercial parking lots and parking structures provide a minimum of one bicycle parking space for every 10 motor vehicle parking spaces.

3. Schools. Elementary and middle schools, both private and public, provide one bicycle parking space for every 10 students and employees. High schools provide one bicycle parking space for every 5 students and employees. All

spaces should be sheltered under an eave, overhang, independent structure, or similar cover.

OAR 660-12-0045
(3)(b) On-site facilities shall be provided which accommodate safe and convenient pedestrian and bicycle access from within new subdivisions, multi-family developments, planned developments, shopping centers, and commercial districts to adjacent residential areas and transit stops, and to neighborhood activity centers within one-half mile of the development. Single-family residential developments shall generally include streets and accessways. Pedestrian circulation through parking lots should generally be provided in the form of accessways.

(B) Bikeways shall be required along arterials and major collectors. Sidewalks shall be required along arterials, collectors and most local streets in urban areas, except that sidewalks are not required along controlled access roadways, such as freeways;

(7) Local governments shall establish standards for local streets and accessways that minimize pavement width and total right-of-way consistent with the operational needs of the facility. The intent of this requirement is that local governments consider and reduce excessive standards for local streets and accessways in order to reduce the cost of construction, provide for more efficient use of urban land, provide for emergency vehicle access while discouraging inappropriate traffic volumes and speeds, and which accommodate convenient pedestrian and bicycle circulation. Not withstanding subsection (1) or (3) of this section, local street standards adopted to meet this requirement need not be adopted as land use regulations.

The current WDC adequately addresses pedestrian and bicycle circulation issues in required areas. However, no current standards exist for bikeways and sidewalks. The TPR requires that at a minimum, bikeways and sidewalks be provided along new or improved arterials and collectors in urban areas (including rural communities). To meet these standards, it is recommended that the City replace existing Table 3.5.1, *Minimum Rights of Way and Street Widths* with a new Table 3.5.1, *City of Warrenton Transportation Standards.* This new table will offer more specific information on street standards and will also include standards, which reflect the new TSP. Chapter 3.5.1 will also be amended to include new street cross-sections developed with the new TSP. Chapter 4.3.200 *Replatting and Vacation of Plats,* will also be amended to better meet Rule requirements.

3.5.1 Transportation Standards

F. Minimum Rights-of-Way and Street Sections. Street rights-of-way and improvements shall be the widths in Table 3.5.1. A variance shall be required in conformance with Section 3.4.1.B to vary the standards in Table 3.5.1. Where a range of width is indicated, the width shall be determined by the decision-making authority based upon the following factors:

1. Street classification in the Transportation System Plan or Comprehensive Plan;
2. Anticipated traffic generation;
3. On-street parking needs;
4. Sidewalk and bikeway requirements based on anticipated level of use;
5. Requirements for placement of utilities;
6. Street lighting;
7. Street tree location, as provided for in Section 3.2;
8. Protection of significant vegetation and wetland and riparian areas, as provided for in Section 3.2 and Section 3.10;
9. Safety and comfort for motorists, bicyclists, and pedestrians;
10. Street furnishings (e.g., benches, lighting, bus shelters, etc.), when provided;
11. Access needs for emergency vehicles; and
12. Transition between different street widths (i.e., existing streets and new streets), as applicable.

~~*Table 3.5.1 – Minimum Rights-of-Way and Street Widths*~~

~~*Street Classification*~~	~~*Minimum Right-of-Way Width*~~	~~*Minimum Pavement Width*~~
~~*Arterial*~~	~~*80 feet*~~	~~*40 feet*~~
~~*Collector*~~	~~*60 feet*~~	~~*36 feet*~~
~~*Sub-Collector*~~	~~*60 feet*~~	~~*36 feet*~~
~~*Minor (Local) Street*~~	~~*50 feet*~~	~~*26 feet*~~

Table 3.5.1 City of Warrenton Street Design Standards

Type of Street	Ave. Daily Trips (ADT)	Right of Way Width	Curb to Curb Pavement Width	Motor Vehicle Travel Lanes[4]	Median/ Flex Lane[5]	Bike Lanes or On-Street Parking (both sides)	Curb	Planting Strip[5]	Side-walks
Arterial Roads									
4-Lane Arterial	varies	80 - 102 ft.	64 - 78 ft.	12 ft.[4]	14 ft.	8 ft.	Yes	6 ft.	6 ft.
2-Lane Arterial	varies	80 ft.	40 - 54 ft.	12 ft.[4]	14 ft.	8 ft.	Yes	6 ft.	6 ft.
Collector Roads									
Collector Road	varies	60 - 64 ft.	36 - 40 ft.	12 ft.[4]	None	6-8 ft.	Yes	6 ft.	6 ft.
Local Roads									
Local Road	varies	50 - 60 ft.	28 - 36 ft.	10-12 ft.	None	8 ft. parking on one or both sides[1]	Yes (one or both sides)	5 ft.	5 ft.[3]
Alternative Local Road[2]	< 250	50 ft.	20 - 28 ft. (no curbs req'd)	10 ft.	None	None [1]	None	5 ft.	None
Alleys	N/A	12 - 24 ft.	12 - 24 ft.	N/A	N/A	None	None	None	None
Multi-Use Paths	N/A	8 - 16 ft.	8 - 16 ft.	N/A	N/A	None	None	None	None

[1]Bike lanes are generally not needed on low volume (less than 3,000 ADT) and/or low travel speed (less than 35 mph) roads.

[2]The alternative local road standard may be used when approved by the City of Warrenton. The standard is intended to apply under the following circumstances:

- -The local road will serve 18 or fewer dwelling units upon buildout of adjacent property.
- -The ADT volume of the road is less than 250 vehicles per day.
- -Significant topographical or environmental constraints are present.
- -Use of the alternative local road standard will not create gaps in connectivity or roadway standards with adjacent roadway sections (i.e. sidewalk, parking, travel lane widths)
- -The City Engineer and Emergency Service Providers have reviewed and accepted usage of the alternative local roadway standard.

[3]Sidewalks are required on all local roads in high-density residential and commercial zones unless exempted by the City Engineer or Planning Commission.

[4]Where parking is constructed next to a travel lane, the travel lane shall be increased to a width of 14' to function as a shared roadway and accommodate bicycles.

[5]Footnote indicates that these features are optional.

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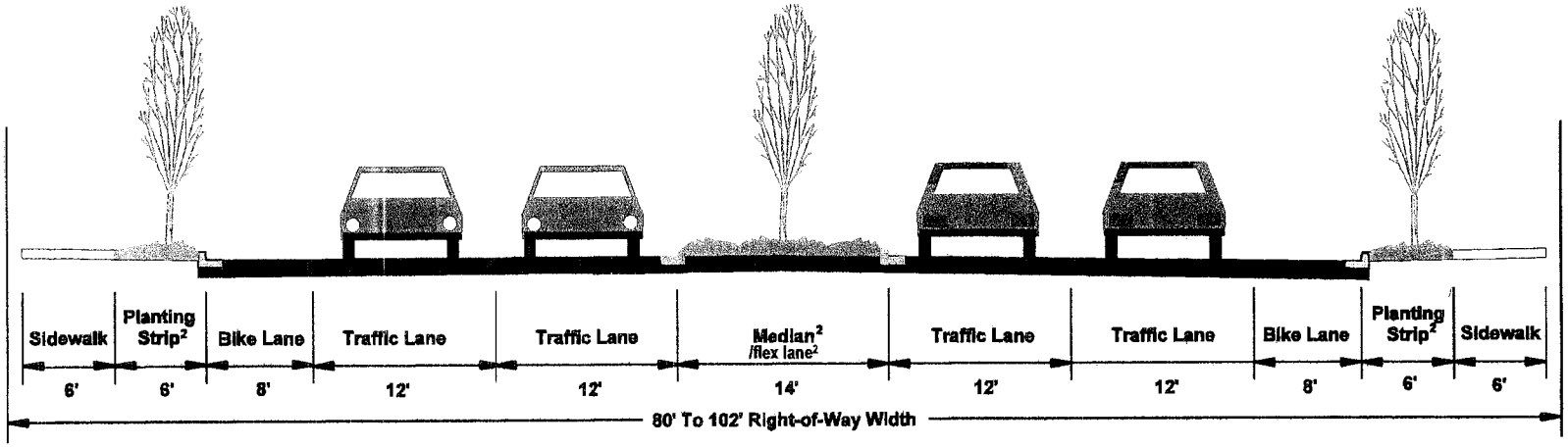
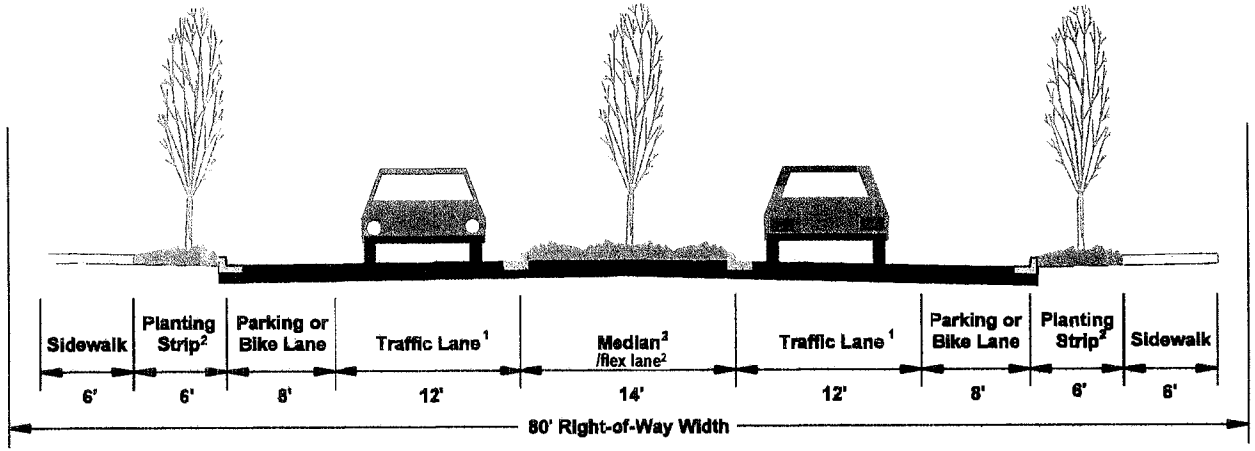


4-Lane Arterial Road



2-Lane Arterial Road

Notes:

[1] Where parking is constructed next to a travel lane, the travel lane width shall be increased to 14' to function as a shared roadway and accommodate bikes.

[2] Note indicates that a roadway feature is optional.

Cross Sections - Arterial Roads

Warrenton Transportation System Plan

Warrenton TSP

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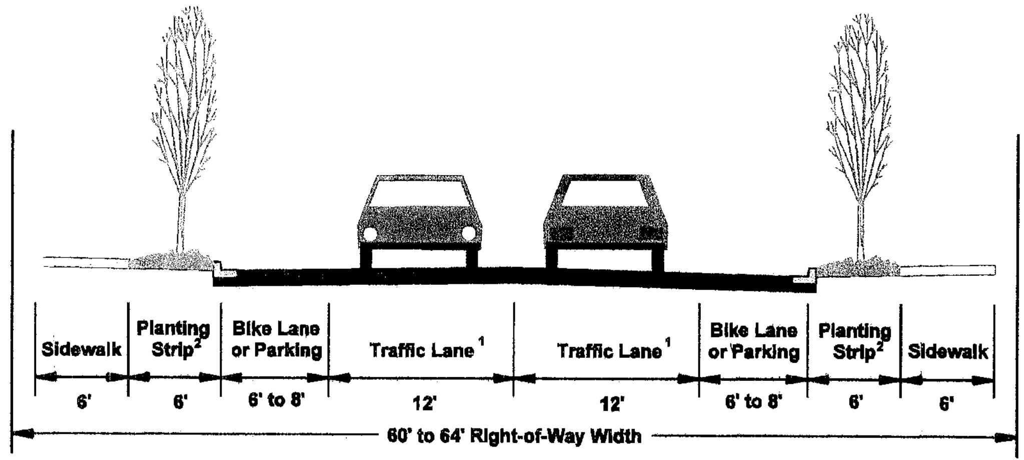

Collector Road

Notes:

[1] Where parking is constructed next to a travel lane, the travel lane width shall be increased to 14' to function as a shared roadway and accommodate bikes.

[2] Note indicates that a roadway feature is optional.

Cross Sections - Collector Roads

Warrenton Transportation System Plan

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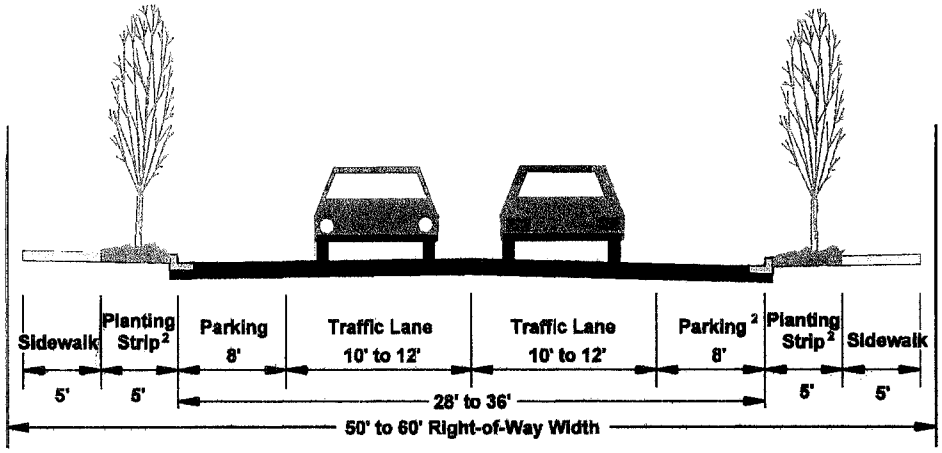
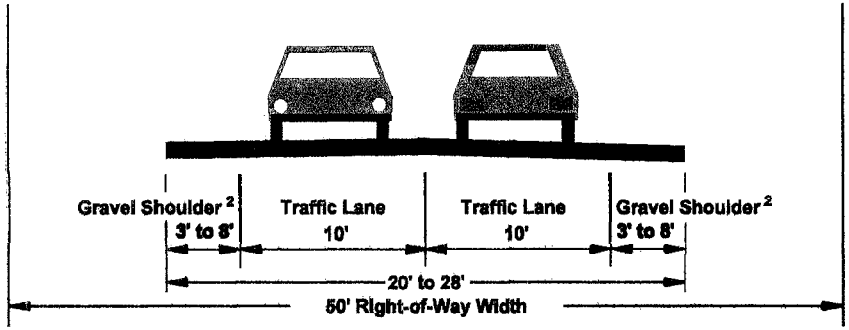


Local Road



Alternative Local Road Standard[3]

Notes:

[2] Note indicates that a roadway feature is optional.

[3] The alternative local road standard may be used when approved by the City of Warrenton. The standard is intended to apply under one of the following circumstances:

1. The local road will serve 16 or fewer dwelling units upon buildout of adjacent property.
2. The ADT volume of the road is less than 250 vehicles/day.
3. Significant topographical or environmental constraints are present.

Providing the following conditions will be met:

4. Use of the alternative local road standard will not create gaps in connectivity or roadway standards with adjacent roadway sections (i.e. sidewalk, parking, travel lane widths).
5. The City Engineer and Emergency Service Providers have reviewed and accepted usage of the alternative local roadway standard.
6. The local road will serve medium to low density zoning (RM, R-10, R-40)

Cross Sections - Local Roads

Warrenton Transportation System Plan

4.3.200 Replatting and Vacation of Plats

A. Replatting and Vacations. Any plat or portion thereof may be replatted or vacated upon receiving an application signed by all of the owners as appearing on the deed.

B. Procedure. All applications for a replat or vacation shall be processed in accordance with the procedures and standards for a subdivision or partition (i.e., the same process used to create the plat shall be used to replat or vacate the plat). The same appeal rights provided through the subdivision an d partition process shall be afforded to the plat vacation process. (See Chapter 4.1 - Types of Applications and Review Procedures.)

C. Basis for denial. A replat or vacation application may be denied if it abridges or destroys any public right in any of its public uses, improvements, streets or alleys; or if it fails to meet any applicable criteria.

D. Recording of vacations. All approved plat vacations shall be recorded in accordance with 4.3.190 and the following procedures:

1. Once recorded, a replat or vacation shall operate to eliminate the force and effect of the plat prior to vacation; and

2. Vacations shall also divest all public rights in the streets, alleys and public grounds, and all dedications laid out or described on the plat.

E. After sale of lots. When lots have been sold, the plat may be vacated only in the manner herein, and provided that all of the owners of lots within the platted area consent in writing to the plat vacation.

F. Vacation of streets. All street vacations shall comply with the procedures and standards set forth in ORS Chapter 271.

G. Vacation of easements or right-of-ways. The City may require accessways, paths or trails as a condition of the vacation of any public easement or right-of-way, in order to establish or maintain a safe, convenient, and direct pedestrian and bicycle circulation system.

APPENDIX A

Project List

APPENDIX A: Project List for Warrenton Transportation System Plan

The following projects are included in Alternative 2 and the Preferred Alternative:

Project Type	Funding Priority	Cost (K)	Description	Source	Facility	BEG MP	END MP	Mobility/Accessibility	Coordination	Non-motorized	Environment	Transportation Funding	Capacity	Safety	Lifeline Routes
Access Management	1 to 5	5	Remove section of curb between Costco and Fred Meyer to improve circulation between the shopping centers	PMT	Commercial	N/A	N/A	+	0	0	+	+	+	0	0
Ped/Bike	1 to 5	490	E. Harbor Drive to US 101 - add bikelanes and sidewalks (w/in Warrenton)	2002-2005 STIP	Hwy 104	3.44	4.68	+	+	+	0	+	0	+	+
Safety	1 to 5	10	Intersection improvements at US 101, Fort Stevens Highway 104, and Perkins Lane. Make Hwy 104 leg right-out only (restrict left turn lanes from this leg).	Existing Conditions Analysis	US 101	9.5	9.5	0	0	0	+	+	+	+	+
Safety	1 to 5	2770	US 101 at SE Marlin Intersection Improvements (Also includes right-in right-out improvements at US 101 and Fort Stevens Highway 104 Spur	2002-2005 STIP	US 101	7.08	7.08	0	+	0	0	+	+	+	0
Safety	1 to 5	1	Addition of mirror at 90 degree corner (Shilo Inn access/NE Pacific Ave.)	Open House	E. Harbor Dr.	N/A	N/A	0	0	0	+	0	0	+	0
Trail	6 to 10	205	Connect Hammond to Fort Stevens State Park with bike path	Field Work	trails	N/A	N/A	+	0	+	0	+	0	+	0
Bicycle	6 to 10	10	Bicycle route designation signage	County Bike Plan	Hwy 105	0	2.35	+	+	+	+	0	0	+	0
Bicycle	6 to 10	25	Stripe 6' bike lanes on both sides of Hwy 104 Spur (Includes Minor Widening)	Field Work	Hwy 104 Spur	Hwy 104	US 101	+	0	+	+	0	0	+	0
Bicycle	6 to 10	1	Bicycle parking	Field Work	City park			+	0	+	+	0	0	0	0
Bicycle	6 to 10	1	Bicycle parking	Field Work	Downtown			+	0	+	+	0	0	0	0
Bicycle	6 to 10	1	Bicycle parking	Field Work	Soccer fields			+	0	+	+	0	0	0	0
Mod/Bicycle/Ped	6 to 10	1700	SW 9th Street - upgraded width with bike lanes and sidewalks. (Note: Cost estimate does not include Right-of-Way, which will be required for the project.)	Existing Conditions Analysis	SW 9th Street	N/A	N/A	+	0	+	-	-	0	+	0
Mod/Ped/Bike	6 to 10	775	Delaura Beach Lane - upgraded roadway width with shoulders	Existing Conditions Analysis	Delaura Beach Lane	SW Pine Dr.	End	+	0	+	-	0	+	+	0
Modernization	6 to 10	300	E. Harbor Drive at SE Neptune Ave. - Signalize intersection	Preferred Alternative	E. Harbor Drive	SE Neptune Ave.		+	+	0	+	0	+	+	0
Modernization	6 to 10	1000	Fort Stevens Highway 104 and Warrenton-Astoria Highway 105 - Signalize, reconfigure intersection and improve pedestrian crossings.	Future Forecasted No-Build Anaysis	Hwy 104	3.32	3.32	+	0	0	0	0	+	+	0
Modernization	6 to 10	460	Sidewalk and Bike Lane Construction - Both Sides of Marlin Drive (Warrenton-Astoria Highway 105)	Existing Conditions Analysis and ODOT Bike Inventory	Hwy 105	0.87	US 101 at Marlin Road Project (2002) MP 1.15	+	0	+	0	0	0	+	0
Pedestrian	6 to 10	Not Estimated	Construct sidewalk on east side of Ridge Road from SW 9th Street to soccer fields	Field Work	Ridge Road			+	0	+	0	0	0	+	0
Pedestrian	6 to 10	Not Estimated	Construct sidewalks on NW Warrenton Drive from NW 14th Street to NW 1st Street	Field Work	NW Warrenton Drive			+	0	+	0	0	0	+	0
Pedestrian	6 to 10	5	Marked crosswalks near community center/park	Field Work	SW Alder Ave.			+	0	+	+	0	0	+	0
Pedestrian	6 to 10	10	ADA compliance--elem school crosswalks	Field Work	SW Cedar Ave. / SW 7th St.			+	0	+	+	0	0	+	0
Ped/Bike	6 to 10	1090	US 101 New Youngs Bay Bridge - Pedestrian Improvements (Note: Cost inflated to year 2002 cost)	Astoria TSP	US 101	4.97	4.97	+	+	+	0	-	0	+	0
Pedestrian	6 to 10	670	Add curb and sidewalk on both sides of E. Harbor Drive	Field Work	Harbor	US 101	Marlin	+	0	+	0	0	0	+	0
Pedestrian	6 to 10	280	Add sidewalks and bike lanes on both sides of SE Neptune Ave.	Field Work	Neptune	US 101	Harbor	+	0	+	0	0	0	+	0
Pedestrian	6 to 10	1170	Install curb and sidewalks both sides of Fort Stevens Highway 104 from MP 0.1 to 1.17	ODOT Bike Inventory	Hwy 104	0.1	1.17	+	+	+	0	0	0	+	0
Pedestrian	6 to 10	130	Install curb and sidewalks both sides of Fort Stevens Highway 104 from MP 3.28 to MP 3.4	ODOT Bike Inventory	Hwy 104	3.28	3.4	+	+	+	0	0	0	+	0
Pedestrian	6 to 10	100	Install curb and sidewalks both sides of Fort Stevens Highway 104 from MP 4.73 to 4.82	ODOT Bike Inventory	Hwy 104	4.73	4.82	+	+	+	0	0	0	+	0
Pedestrian	6 to 10	950	Install curb and sidewalks both sides of Warrenton-Astoria Highway 105 from MP 0 to 0.87	ODOT Bike Inventory	Hwy 105	0	0.87	+	+	+	0	0	0	+	0
Safety	6 to 10	500	Realign intersection of Warrenton-Astoria Highway 105 and SE 12th Place (Airport) (Note: Cost assumes minor realignment of the intersection with turn lanes.)	AC	Hwy 105			0	+	0	0	0	0	+	+
Pedestrian	6 to 10	5	Crosswalk for better ped. access to elem school at SW 9th Street	Field Work	Hwy 104			+	0	+	+	0	0	+	0
Bicycle	11 to 15	5	Signage indicating bicyclists in outer lane (Warrenton)	Field Work	US 101	4.97	9.48	0	0	+	+	0	0	+	0
Modernization	11 to 15	500	DeLaura Beach Lane and Ridge Road - intersection geometry (Note: Cost assumes realignment of the intersection, possibly a roundabout.)	Existing Conditions Analysis	Ridge Road at Delaura Beach Lane	N/A	N/A	0	0	0	0	0	+	+	+
Modernization	11 to 15	685	Extend SW 2nd Street to connect with SW Juniper Ave.	Field Work	SW 2nd St. / SW Juniper Ave.			+	0	+	-	-	+	0	0
Modernization	11 to 15	550	Connect NW/SW Juniper Ave. with Ridge Road	PMT	Juniper Ave. / Ridge Road	N/A	N/A	+	0	+	-	-	+	0	0
Modernization	16 to 20	3530	Construct curb, sidewalk and new local roadway along privated drive (SE 7th Street) from Hwy 104 to SE Marlin Ave.. Includes a bridge crossing over the Skipanon Slough	Field Work	Private Drive (SE 7th Street)			+	0	+	-	-	+	0	0
Modernization	11 to 15	50	Shoulder widening on Fort Stevens Highway 104 (Both Sides)	Existing Conditions Analysis	Hwy 104	4.38	4.49	+	0	+	0	0	0	+	+
Pedestrian	11 to 15	920	Construct curb and sidewalk on both sides of Hwy 104 Spur	Field Work	Hwy 104 Spur	Hwy 101	Hwy 104	+	0	+	0	0	0	+	0
Safety	11 to 15	200	Fort Stevens Highway 104 & SE 5th Street - intersection geometry	AC	Hwy 104	2.76	2.76	0	0	0	+	0	0	+	+
Trail	11 to 15	Not Estimated	Improved pedestrian amenities on Warrenton Waterfront Trail (restrooms, lighting, trash receptacles)	Field Work	Throughout			0	0	+	+	0	0	+	0
Trail	11 to 15	325	Pave top of dike from intersection of Hwy 104 and 105 to Hammond	AC	Warrenton Waterfront Trail			+	0	+	0	0	0	0	0
Modernization	16 to 20	1000	Realignment of the US 101 and Fort Stevens Highway 104 intersection (Include signal or interchange)	Preferred Alternative	US 101			+	0	0	-	-	+	+	+
Safety	16 to 20	400	US 101 and SE Dolphin Ave. - intersection geometry (improve existing geometry if interchange is not built)	Existing Conditions Analysis and future forecasted no-build analysis	US 101	8.38	8.38	0	0	0	0	0	+	+	+
Safety	16 to 20	250	Fort Stevens Highway 104 and Seventh Avenue - Intersection geometry	Existing Conditions Analysis	Hwy 104	1.17	1.17	0	0	0	+	0	0	+	0

The following modernization projects are included in the Preferred Alternative:

Modernization	Designated for Regional Study	47200	Astoria-Warrenton Parkway Improvements on Warrenton-Astoria Highway 105, including improvements to the Old Youngs Bay Bridge and Lewis and Clark Bridge (Note: Estimate of $43,200,000 in 1999. Inflated to year 2002 value using 3% inf. rate.)	Preferred Alternative	Warrenton-Astoria Highway 105	OR 202	Fort Clatsop	+	+	+	-	-	+	+	+
Modernization	6 to 10	4000	New Section of Astoria-Warrenton Parkway (includes interchange at SE Dolphin Ave. and realignment of Warrenton-Astoria Highway 105 and Astoria-Warrenton Parkway intersection). (Note: Estimate of $3,500,000 in 1999. Inflated to year 2002 value using 3% inflation rate plus added intersection costs.)	Preferred Alternative	New	Warrenton-Astoria Highway 105	US 101	+	+	+	-	-	+	+	+
Modernization	6 to 10	550	Add westbound left turn lane at E. Harbor Drive and SE Marlin Ave. Intersection. Realign SE Marlin Ave. approach and signalize intersection.	Preferred Alternative	E. Harbor Drive	SE Marlin Ave.		+	+	0	0	0	+	+	0
Modernization	11 to 15	300	Add right turn lanes to Marlin Drive approaches at US 101	Preferred Alternative	SE Marlin Ave.			+	0	0	0	0	+	+	0
Modernization	To Be Determined Through Future Planning Study	Not Estimated	Frontage Roads along US 101	Preferred Alternative	US 101	TBD	TBD								
Modernization	Designated for Regional Study	160000	Widen New Youngs Bay Bridge to 4-lane Section	Preferred Alternative	US 101			+	+	+	-	-	+	0	+
Modernization	16 to 20	1000	Additional turn lanes at the Harbor Street - US 101 Intersection (Additional Eastbound left turn lane, northbound through lane, and southbound through lane) or consider grade seperated interchange	Preferred Alternative	E. Harbor Drive			+	+	0	-	-	+	+	+

The following air projects should be constructed at the Astoria Regional Airport:

Air		1000	Improve runway surface at Astoria Regional Airport	Astoria TSP	Air	N/A	N/A
Air			Improve runway safety areas	Existing Conditions	Air		
Air			Improve existing water facilities	Existing Conditions	Air		

The following transit improvements should be implemented:

Transit		20	US 101 North and South of the New Youngs Bay Bridge - install shelters and kiosks	Astoria TSP	Transit	4.97	4.97
Transit			Investigate the possibility of intercity bus service that connects downtown Warrenton with the commercial area and KOA/Fort Stevens State Park	AC	Transit	N/A	N/A

Transit			Identify ways to improve transit service between Cannon Beach and Astoria and between Astoria and Warrenton shopping areas.	Draft Oregon Coast Highway Master Plan	Transit	N/A	N/A
Transit			Provide transit amenities (covered shelters, signage, pullouts)	Existing Conditions	Transit	N/A	N/A
Transit			Extend hours, decrease headway, review scheduling, improve efficiency of dial-a-ride program, meet the needs of future demands, improve connections, and advertise and promote services. Also, transit amenities lack in certain areas.	SETD	Transit	N/A	N/A
Transit			ADA compliance	Field Work	SW 9th St. / SW Cedar Ave. transit stop		
Transit			ADA compliance	Field Work	SW Alder Ave. / SW 2nd Street transit stop		
Transit			ADA compliance	Field Work	Corky's transit stop		
Transit			ADA compliance	Field Work	Kampers West transit stop		
Transit			ADA compliance	Field Work	KOA transit stop		
Transit			ADA compliance	Field Work	Parkview Apts. Transit stop		
Transit			ADA compliance	Field Work	Point Adams transit stop		

The following bridge improvements should be constructed:

Bridge			Bridge with sufficiency rating less than 45 (actual rating = 38.3, ADT = 2200, Functionally Obsolete), Skipanon River Br. No. 1400	ODOT	Hwy 104 Spur	4.62	4.62
Bridge		2953	Painting Operator House and Tower, Electrical Upgrade, Repair Girders - Youngs Bay Bridge No. 08306	2002-2005 STIP	US 101	4.91	4.91

The following issues should be addressed at the Warrenton Mooring Basin:

Water			Seasonal usage and inadequate parking at the Warrenton Mooring Basin	Existing Conditions Analysis	Water	N/A	N/A

The following preservation, operations, and maintenance projects should be constructed:

Maintenance	I		Overlay preservation on Warrenton-Astoria Highway 105	Existing Conditions Analysis	Hwy 105	1.27	2.35
Operations	V	1625	Astoria Signal and sign upgrades, VMS on Youngs Bay Bridge (w/in Astoria)	2002-2005 STIP	US 30	98.05	98.36
Preservation	V	2802	Pavement overlay - Fort Stevens park to US 101	2002-2005 STIP	Hwy 104	4.65	6.03
Operations	I	25	Improved striping and signage to the Airport	Existing Conditions and Draft Oregon Coast Highway Master Plan	Air		
Preservation	S		Overlay preservation on Fort Stevens Highway 104 Spur	Existing Conditions Analysis	Hwy 104 Spur	4.53	5.37
Operations	S		Improve signage and entrances for Fort Stevens scenic loop and Fort Clatsop	Draft Oregon Coast Highway Master Plan	US 101	4.97	9.48

The following planning projects and policy issues should be addressed:

Planning			Designate as shared roadway	W-ton TSP (1993)	Old Ridge Road		
Planning			Develop an access management plan for Warrenton arterials and collectors	Existing Conditions Analysis	All	N/A	N/A
Planning			Develop an access management plan for Warrenton (address needs of development south of Fort Stevens). Consider four-lane divided cross section as part of plan	Draft Oregon Coast Highway Master Plan	US 101	4.97	9.48