DRAFT REPORT
SCAPPOOSE TRANSPORTATION SYSTEM PLAN
SCAPPOOSE, OREGON

OCTOBER 1997

Prepared for
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INTRODUCTION

The purpose of this study is to develop a community-based multi-modal transportation system plan (TSP) that addresses transportation needs for the year 2015 associated with anticipated future growth in the Scappoose urban area. The plan is intended to serve as a guide for the management of existing transportation facilities, and for the design and implementation of future transportation facilities.

The plan was prepared to address federal and state regulations that require urban areas to do long-range planning, as well as to address local concerns regarding rapid growth in the Scappoose urban area. The long-range plan implements portions of the Oregon Transportation Plan and is in conformance with the State Transportation Planning Rule (Goal 12). The planning process was driven by community involvement and guided by local public agency staff.

This report begins by describing Goal 12 and the purpose of the Transportation Planning Rule, and by defining the requirements of the rule specific to the City of Scappoose. Other plans, such as the Oregon Transportation Plan and the Portland-Astoria Corridor (US Highway 30) Plan, have elements that must be concurrent with the Scappoose TSP are also described. Section Three describes the planning process, and how the transportation system plan was developed. Goals and objectives established for the study are then presented in Section Four.

Current transportation conditions based on an inventory of the existing system are presented in Section Five. The 2015 population and employment forecast, and the resulting travel demand on the regional arterial and collector street system are presented in Section Six, and transportation system options studied are presented in Section Seven.

Finally, the transportation system plan itself is presented in Section Eight, followed by Section Nine which presents funding options and the financial plan. An appendix presents the results of the street system inventory, population and employment forecasts, and other supplemental information.

TRANSPORTATION SYSTEM PLAN REQUIREMENTS

The City of Scappoose Transportation System Plan needs to meet the requirements of Statewide Planning Goal 12 and its implementing ordinance, the Transportation Planning Rule (OAR Chapter 660, Division 12). Goal 12 affects all levels of government, and requires that transportation plans be coordinated among all jurisdictions. Two other jurisdictions affect Scappoose: Columbia County and the state. The elements of the plans for these jurisdictions that pertain to Scappoose are summarized in this section.

The Intermodal Surface Transportation Efficiency Act (ISTEA) is landmark federal legislation that specifies requirements for statewide and metropolitan area long-range planning. The law does not specify planning requirements for areas with less than 50,000 population, such as the City of Scappoose urban area. The legislation is however relevant to the City of Scappoose Transportation System Plan study as it redefines the manner in which federal aid is provided for highway and transit programs. The planning requirements under the federal ISTEA act are parallel to those required by Oregon's Transportation Planning Rule (Goal 12).

GOAL 12

In the mid-1970s, Oregon adopted 19 Statewide Planning Goals to be implemented in local comprehensive plans. The aim of Goal 12 (Transportation) is "to provide and encourage a safe, convenient, and economical transportation system."

Each community, region, and metropolitan area updated the transportation element of their comprehensive plans according to the following guidelines set forth in Goal 12.

> "A transportation plan shall (1) consider all modes of transportation including mass transit, air, water, pipeline, rail, highway, bicycle and pedestrian; (2) be based upon an inventory of local, regional and state transportation needs; (3) consider the differences in social consequences that would result from utilizing differing combinations of transportation modes; (4) avoid principal reliance upon any one mode of transportation; (5) minimize adverse social, economic and environmental impacts and costs; (6) conserve energy; (7) meet the needs of the transportation disadvantaged by improving transportation services; (8) facilitate the flow of goods and services so as to strengthen the local and regional economy; and (9) conform with local and regional comprehensive land use plans."

OREGON TRANSPORTATION PLANNING RULE

The Transportation Planning Rule (TPR) was developed by the Oregon Land Conservation and Development Commission (LCDC) and the Oregon Department of Transportation (ODOT), and was adopted in April 1991. The TPR implements Goal 12.

Essentially, the Transportation Planning Rule requires that cities, counties, metropolitan planning organizations (MPOs), and state agencies prepare and adopt TSPs. A TSP is "a plan for one or more transportation facilities that are planned, developed, operated, and maintained in a coordinated manner to supply continuity of movement between modes, and within and between geographic and jurisdictional areas."

The ultimate aim of the rule is to encourage a multi-modal transportation network throughout the state that will reduce reliance on the automobile and ensure that local, state, and regional transportation systems "support a pattern of travel and land use in urban areas which will avoid the air pollution, traffic and livability problems faced by other areas of the country."

The TPR requirements vary based on population size and geographic location of each jurisdiction. It also sets forth a schedule for compliance. The MPOs must complete regional transportation system plans by May 1996. Cities and counties within MPOs must complete their local plans within a year of the MPO plan adoption. Jurisdictions outside of MPOs, such as Scappoose, must complete plans by May 1997.

Transportation Planning Rule Requirements for Scappoose

The City of Scappoose falls into the jurisdictional category of cities with a population between 2,500 and 25,000 that are located outside of a major urban area. In preparing its local transportation system plan, the City of Scappoose must "establish a system of transportation facilities and services adequate to meet identified local transportation needs and shall be consistent with regional TSP's and adopted elements of the state TSP."

The following plan elements are required in order to satisfy the TPR:

1. A street system plan for a network of arterial and collector roadways.
2. A public transportation plan.
3. A bicycle and pedestrian plan.
4. An air, rail, water, and pipeline plan.
5. Policies and land use regulations for implementing the TSP.
6. A transportation financing program.

Items 1 through 4 are addressed in the section titled, "The Transportation System Plan." The transportation financing program, Item 6, is presented in the section titled, "Funding Options and Financial Plan."

The policies and land use regulations, Item 5, will be prepared separately from this report. These will include land use and subdivision ordinance amendments to protect transportation facilities for their identified functions. In particular, these amendments will include street standards and access control measures. The city will also amend land use and subdivision ordinances to require bicycle parking facilities and facilities for safe, convenient, and direct pedestrian and bicycle access within and between residential, commercial, employment, and institutional areas.

OREGON TRANSPORTATION PLAN

The Oregon Transportation Plan (OTP) was completed and adopted by the Oregon Transportation Commission in September 1992. Several alternative approaches to developing the transportation plan were evaluated as part of the OTP planning process. The preferred plan presented in the OTP followed the Livability Approach, which "depends heavily on the concept of minimum levels of service within each transportation mode to assure appropriate transportation alternatives to all areas of the state."

In its inventory of existing facilities, the OTP identifies several transportation facilities of significance in the City of Scappoose. These include the following:

- Highway 30 (Lower Columbia River Highway), between Portland and Astoria, is identified as a highway of statewide significance.
- Intercity bus service in the City of Scappoose provided by Dash-hound Bus Lines along Highway 30 between Portland and Astoria (no longer in operation).
- Portland Western Railroad through Scappoose is identified as a major rail line.
- Scappoose Industrial Airpark.

Plans were prepared for each of the component transportation modes as a supplement to the Oregon Transportation Plan. The adopted policies in the modal plans that are of relevance to the Scappoose urban area are included in the following discussion.

Oregon Highway Plan

Highway 30 through Scappoose is identified as an Access Oregon Highway (AOH) in the Oregon Highway Plan. The goal of the AOH system is to provide for the economic growth of Oregon by moving through traffic safely and efficiently through and between geographic and major economic areas within Oregon and adjacent states, and through major metropolitan areas. The following are implementation strategies included in the AOH plan that are of significance to the Scappoose urban area:

- A design level of service (LOS) C is defined as acceptable through a 20-year horizon for the Highway 30 through Scappoose, a Statewide Highway through a non-metropolitan urban area.
- Limited access control with public roads spaced at a spacing of at least 1/4 mile and private drives spaced at least 500 feet apart is recommended for Highway 30 through Scappoose (an Access Management Category 4 highway), between High School Way and Laurel Street. The recommended signal spacing is 1/2 mile.
- Highway 30 through Scappoose, south of High School Way and north of Laurel Street is identified as a Category 3 highway. Thereby, limited access control with public roads spaced at a spacing of at least 1/2 mile to 1 mile is recommended. Private drives are recommended to be of the right-in/right-out only type and spaced at least 800 feet apart. The recommended signal spacing is 1/2 mile to 1 mile.
- AOH facilities are to be designed to achieve the highest safe operating speeds with an operating speed of at least 45 mph in higher density urban areas.
- In areas of potential development or redevelopment, strip commercial development (direct access to the facility) should be discouraged.
- Where applicable, multimodal options and design features for the movement of people and goods to reduce highway improvement needs should be considered.

Statewide Intercity Passenger Service Plan

The policy requires that specialized transportation services, airport, and intercity common carrier services must be planned as an integrated system to provide accessibility between communities. The following minimum level of service standards for intercity passenger services apply to Scappoose:

- Intercity passenger service should be available for an incorporated city or groups of cities within five miles of one another having a combined population of over 2,500, and located 20 miles or more from the nearest Oregon city with a larger population and economy. Services should allow a round trip to be made within a day.
- Local public transit services and elderly and disadvantaged service providers should regularly connect with intercity passenger services.
- To the extent possible, direct connections should be available between intercity bus, air, rail, airport limousine services, and local transit services.
- Services shall be provided in compliance with the Americans with Disabilities Act (ADA) requirements for all modes and transfer facilities.

Statewide Freight Service Plan

The following level of standards are proposed to allow the efficient movement of freight:

- Highway freight accessing intermodal truck/rail terminals or moving within Oregon should experience level of service C or better on Oregon highways during off-peak periods.

Bicycle and Pedestrian Service Plan

The following are principles established for bikeway development in the Oregon Bicycle Plan that apply to the City of Scappoose:

- Bicycle and pedestrian networks should be developed and promoted in all urban areas to provide safe, direct and convenient access to all major employment, shopping, educational and recreational destinations in a manner that would double person trips by bicycle and walking.
- Secure and convenient bicycle storage available to the public should be provided at all major employment and shopping centers, park and ride lots, passenger terminals and recreation destinations.
- Statewide and regional bicycle systems should be integrated with other transportation systems in urban and rural areas to accommodate commuting and other trips by bicycle. Safe, direct, and continuous bikeways free of unnecessary delays should be provided along all urban arterial and major collector routes.

PORTLAND-ASTORIA CORRIDOR (US HIGHWAY 30) PLAN

The Portland-Astoria Corridor Plan builds on the strategies and policies laid out in the OTP and each of the modal plans, and it is intended to provide a framework for long-term planning and development of all transportation modes within the Portland-Astoria (US Highway 30) Corridor. The first phase of the plan included the development and adoption of interim strategies for the corridor. The second phase uses the interim strategies and guidelines for the preparation of TSP's for counties and cities along the corridor, like the City of Scappoose TSP. The third phase of the planning process will include the resolution of any outstanding environmental, land use or other issues through refinement plans.

The Corridor Plan identifies key strategies for each major travel mode. The corridor strategies that are relevant to the Scappoose urban area are listed below by travel mode.

Highway Travel

- Provide no additional expansion in highway capacity from Columbia City to Portland, except for transportation system management (TSM) improvements such as turning lanes and signal improvements.
- Maintain existing level of highway improvements from Columbia City to Portland and encourage use of I-5 as an alternate route to Rainier, Clatskanie, and Astoria to avoid traffic congestion in this segment.
- Improve signalization to facilitate movement through urban areas.
- Apply the highest applicable (most restrictive) access management category for each highway segment, consistent with existing or planned adjacent land uses.
- Provide a better network of local streets (alternate routes) in urban and developed rural areas, and thereby reduce the need for Highway 30 improvements.
- Develop local access management and circulation plans to relieve localized congestion problems, to facilitate local trips crossing Highway 30 safely without unduly interfering with through traffic and to meet other local transportation system needs.

Pedestrian/Bicycle Travel

- In urban areas, at a minimum, provide six-foot sidewalks on both sides of the highway and convenient and safe pedestrian crossings.
- At a minimum, provide five-foot shoulders for bicycle travel along the entire corridor length.
- Provide connections to local bicycling and hiking routes where feasible.
- Provide bicycle crossings across Highway 30 where appropriate and feasible.
- Develop remaining sections of Old Highway 30 into bicycle routes.

Transit Service

- Investigate contracted transit services to serve increasing numbers of commuters between St. Helens and Portland.
- Investigate the potential for replacement of intercity bus service between Astoria and Portland.
- Develop "Park and Ride" and "Park and Pool" lots.
- Manage the rail line to preserve future opportunities for rail service, particularly self-propelled passenger rail. Through TSP's and the Corridor General Plan, identify the conditions that would warrant future investigation of the feasibility of passenger rail services.

Rail Service

- Upgrade rail crossings in conjunction with other roadway improvements.
- Develop excursion/tourism uses of the railroad.

Freight Service

- Minimize additional truck use of Highway 30 by promoting increased freight movement by rail and water.
- Improve truck access to industrial sites, including turn and acceleration/ deceleration lanes where appropriate.
- Design local street systems to separate local truck traffic from through traffic.
- Promote use by the ports and the trucking industry of I-5 as a truck route.

Telecommunications

- Promote telecommunication technologies as a means to reduce vehicle miles traveled.

Air Service

- Investigate use of the Scappoose Industrial Airpark as a general aviation airport to accommodate increased regional demands.

Land Use Strategies

- Encourage transportation-efficient land use patterns that reduce vehicle miles traveled and promote a live/work balance, e.g., clustered development, mixed uses, maximum parking ratios, and circulation systems that reduce out-of-direction travel.

COLUMBIA COUNTY COMPREHENSIVE PLAN

The Columbia County Comprehensive Plan was prepared in response to the statewide planning goals, and enacted in 1978. The following are some issues discussed in the Plan that are of specific relevance to the Scappoose TSP:

- The Scappoose Industrial Airpark is growing steadily and it is expected to be used as a base for aircraft from the Portland area when the general aviation facilities at Troutdale and Hillsboro reach their capacity.
- Colco Transportation operated by the Columbia County Council of Senior Citizens, the provider of demand-responsive bus service for elderly and disadvantaged citizens in the county since 1969, has requested that a county Transportation Service District be established for further federal and state funding. The District could explore the feasibility of establishing a fixed point, variable route system, and it could establish future connecting transit service to the Longview and Portland urban areas.
- The County Plan recognizes the scarcity of funds for new highway construction, and recommends a new low capital approach aimed at preserving road capacity. Techniques such as restricting (direct) access, frontage roads, and the development of a public transit system are recommended.

THE PLANNING PROCESS

This Plan was developed through a series of technical analyses combined with systematic input and review by city staff, the Transportation Advisory Committee, and the public. Key elements of the planning process are summarized in the following discussion.

PUBLIC INVOLVEMENT

Community involvement was an important part of developing the TSP. Interaction with the community was achieved in two ways: holding open community meetings and forming a Transportation Advisory Committee.

The Transportation Advisory Committee (TAC) was formed to provide guidance to the consultant, to review work products, and to aid the city in making decisions regarding the plan. It consisted of representatives from the business community, the residential neighborhoods, the City Council and Planning Commission, Oregon Department of Transportation (ODOT), and city staff. TAC meetings were held throughout the planning process.

Two open house community meetings were held during the planning process. The first was held at the beginning of the process in a workshop format to solicit public input on issues and problems to be addressed. The results of this meeting formed the basis for the transportation goals and objectives. A second meeting was held at the end of the process for community review and comments upon completion of the draft TSP.

REVIEW EXISTING PLANS AND POLICIES

To begin the planning process, existing plans and policies that related to the evaluation and development of the transportation system in the Scappoose urban area were reviewed. The purposes of this effort were two-fold. The review establishes the history of planning in the metropolitan area, including how population and employment were projected and how those projections compare with current measurements, what street system improvements were planned and which were implemented, how other transportation facilities were planned and implemented, and how the city is currently managing its ongoing development.

INVENTORY EXISTING PUBLIC FACILITIES

The inventory of existing facilities catalogs the current transportation system and identifies how that system currently operates. The results of the inventory are described in the section titled "Current Transportation Conditions". Table A in Appendix A summarizes the inventory of the existing arterial and collector street system.

FORECAST DEMOGRAPHICS AND TRAVEL DEMAND

As required by the Transportation Planning Rule, the TSP must address a 20-year forecasting period. The 20-year travel forecasts were developed based on projections of population and employment by different land use categories within the Urban Growth Boundary. These projections, along with current street capacity and travel time

characteristics were then entered into a computer model to develop 2015 travel forecasts. This process is described in greater detail in the "Forecast Travel Demand" section.

ROADWAY SYSTEM ALTERNATIVES

Once the travel forecasting model has been developed, a series of roadway system alternatives were evaluated. The initial alternative evaluated was the "No Build," which is the existing street system plus any committed street system improvements. Based on projected capacity deficiencies and safety concerns identified in the no-build alternative, improvements to the street system were developed.

DEVELOP TRANSPORTATION SYSTEM PLAN

The TSP was then developed for each mode of transportation. The street system plan was developed from the forecasting and improvements described above. The bicycle and pedestrian plans were developed to follow requirements set forth by the Transportation Planning Rule and the Oregon Bicycle and Pedestrian Plan, and they were based on input received from the TAC and the public. The public transportation, air, water, rail, and pipeline plans were developed based on discussions with the owners and operators of those facilities, and by requirements set forth in the TPR.

DEVELOP FUNDING PLAN AND CAPITAL IMPROVEMENT PROGRAM

The capital improvement program was developed from the short-term improvements and the recommended street system plan, while the funding analysis examined methods for financing these improvements. These elements are described in the "Funding Options and Financial Plan" section.

GOALS AND OBJECTIVES

The purpose of the Transportation System Plan is to provide a guide for the City of Scappoose to fulfill its goals and objectives of improved mobility in the 21st century. Throughout the planning process, each element of the plan was evaluated against these parameters:

OVERALL TRANSPORTATION GOAL

Develop an urban area transportation system which enhances the livability of Scappoose and accommodates growth and development through careful planning and management of existing and future transportation facilities.

GOAL 1: Enhance Transportation User Safety

Objectives

A. Identify measures to enhance safety along streets and at street intersections in the Scappoose urban area.

B. Provide safe east-west crossings across Highway 30 for pedestrians and bicyclists.

C. Provide safe access to schools located in the proximity of Highway 30, specifically in relation to access by school children using crosswalks across Highway 30.

D. Provide safe east-west vehicular access across Highway 30 including, but not limited to, the following intersections: Columbia Boulevard, Vernonia Highway, Bonneville/Johnson's Landing Road, Old Portland Road, Fred Meyer access, High School access, and Williams/Post Office access.

E. Review and revise, if necessary, street cross section standards for local, collector, and arterial streets to enhance safety (and mobility).

F. Identify appropriate vehicular travel speeds for travel along Highway 30, between the county line and Scappoose.

G. Evaluate access across the railroad, including the safety of railroad crossings.

GOAL 2: Enhance Transportation Mobility

Objectives

A. Develop a safe and efficient arterial and collector street system that provides additional north-south local access routes, alternative to travel on Highway 30.

B. Develop a safe and efficient east-west arterial and collector system consisting of local access routes for access to and across the highway.

C. Evaluate the need for traffic signals in the city, particularly along Highway 30.

D. Improve intersection operations along Highway 30 by measures including, but not limited to, coordinating traffic signals along the highway.

E. Evaluate vehicular mobility in downtown.

F. Develop access management strategies for Highway 30, specifically in relation to businesses located along the highway.

GOAL 3: Increase the use of Alternative Travel Modes Through Improved Safety and Service

Objectives

A. Develop a bicycle and pedestrian facility network.

B. Provide safe east-west access for pedestrians and bicyclists across Highway 30.

C. Provide pedestrian and bicycle access, especially when direct motor vehicle access is not possible.

D. Evaluate the need for (exclusive) bike paths, including the Scappoose Creek Greenway.

E. Identify transportation demand management measures which could reduce peak hour demand, particularly for travel along Highway 30 (to Portland).

F. Evaluate the need for passenger rail transportation and other mass transit alternatives for travel to Portland and Astoria, for commuting and recreation purposes.

G. Identify the need for a carpool/vanpool program for reducing commuter vehicular travel demand along Highway 30 (to Portland).

GOAL 4: Develop a Transportation System that Supports Planned Land Uses

Objectives

A. Identify roadway system needs to serve undeveloped areas so that steps can be taken to preserve right-of-ways and maintain adequate traffic circulation.

B. Integrate new arterial and collector routes into the existing city grid system.

C. Identify improvements to existing policies and standards that address street connectivity and spacing.

D. Develop a street system plan that meets the travel needs forecast for the 20-year planning horizon, and also anticipates the travel needs associated with a potential expansion of the urban growth boundary (UGB).

GOAL 5: **Reduce Truck Traffic Along Highway 30**

Objectives

A. Identify alternative strategies to move freight along Highway 30 corridor, including by rail and barge.

B. Evaluate the need for a bypass to Highway 30, especially for use as a truck route.

GOAL 6: **Develop a Transportation Facilities Capital Improvement Program (CIP) that has Identified Funding**

Objectives

A. Identify sources and strategies for funding recommended transportation improvements.

CURRENT TRANSPORTATION CONDITIONS

An inventory was conducted of the existing transportation system in the Scappoose study area (Figure 1). This inventory covered the street system as well as the pedestrian system, bikeways, public transportation, rail, air, water, and pipelines.

STREET SYSTEM

The current transportation conditions on the existing roadways were measured and examined during the summer of 1995. Data collection included a physical inventory of the city's arterial and collector roads and a traffic count program that measured volumes at 15 street or intersection locations. The results of the inventory were used to define existing roadway capacities and short term improvements, and the PM peak hour traffic counts were used as a base for developing the traffic forecasting model.

Physical Inventory

The existing street system inventory was conducted for all highways, arterial roadways, and collector roadways within Scappoose as well as those in Columbia County which interact with city streets. Inventory elements include:

- street classification and jurisdiction;
- street width and right-of-way;
- number of travel lanes;
- presence of on-street parking, sidewalks, or bikeways;
- speed limit; and
- general pavement conditions.

Figure 2 shows the street functional classification as well as the location of traffic signals. Appendix A, Table A lists the complete inventory.

Highways. Scappoose is served by one state highway, the Highway 30 (Highway 30), managed and maintained by ODOT. Highway 30 is classified as a highway of statewide significance in the *1991 Oregon Highway Plan (OHP).*

As defined in *1991 Highway Plan,* the primary function of Statewide Highways is to provide connections and links to larger urban areas, ports and major recreation areas that are not directly served by interstate highways. Statewide highways provide links to the interstate system and alternate links to other states. A secondary function is to provide links and connections for intra-urban and intra-regional trips. Connections are primarily with roadways that serve areas of regional significance or scope.

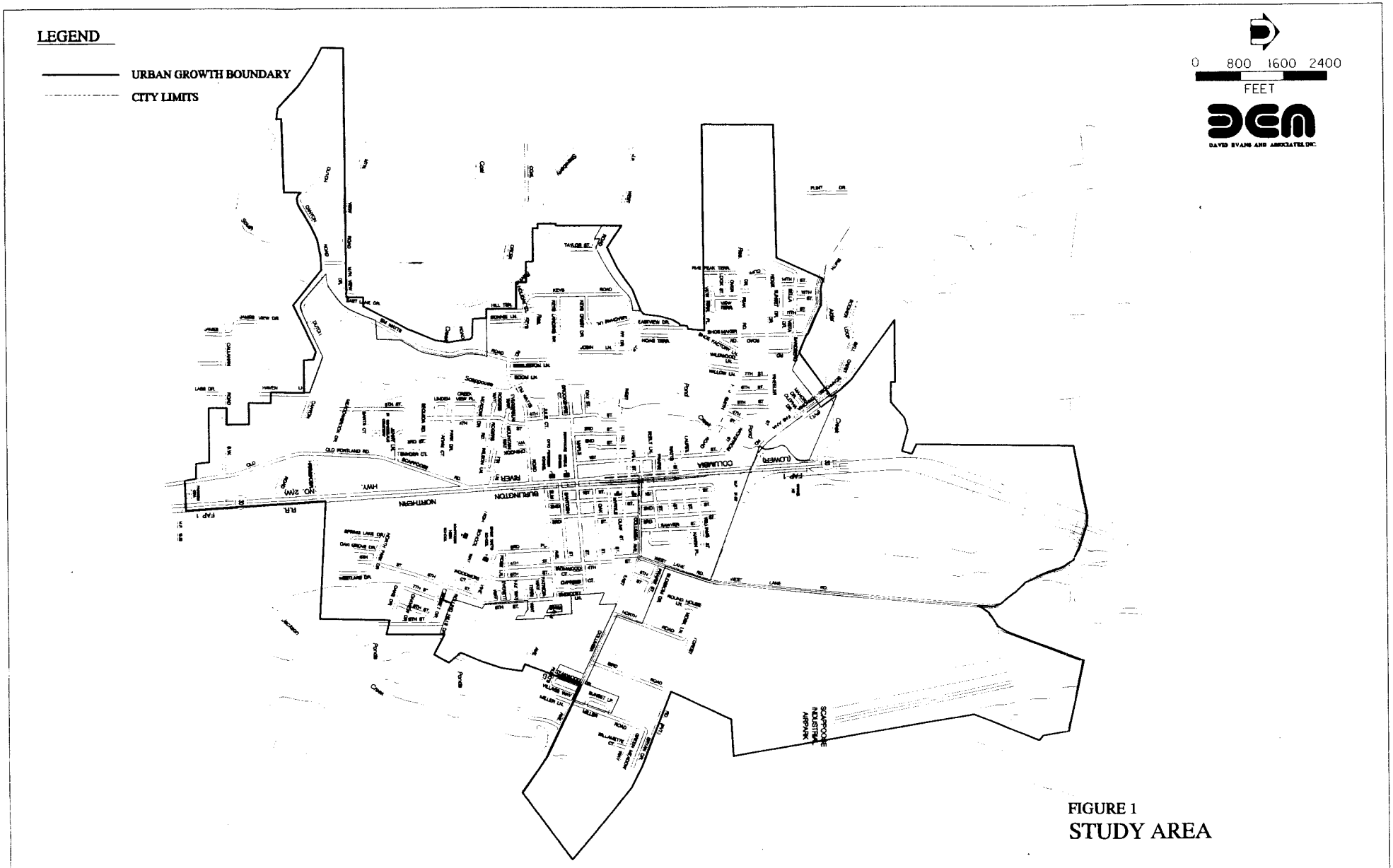
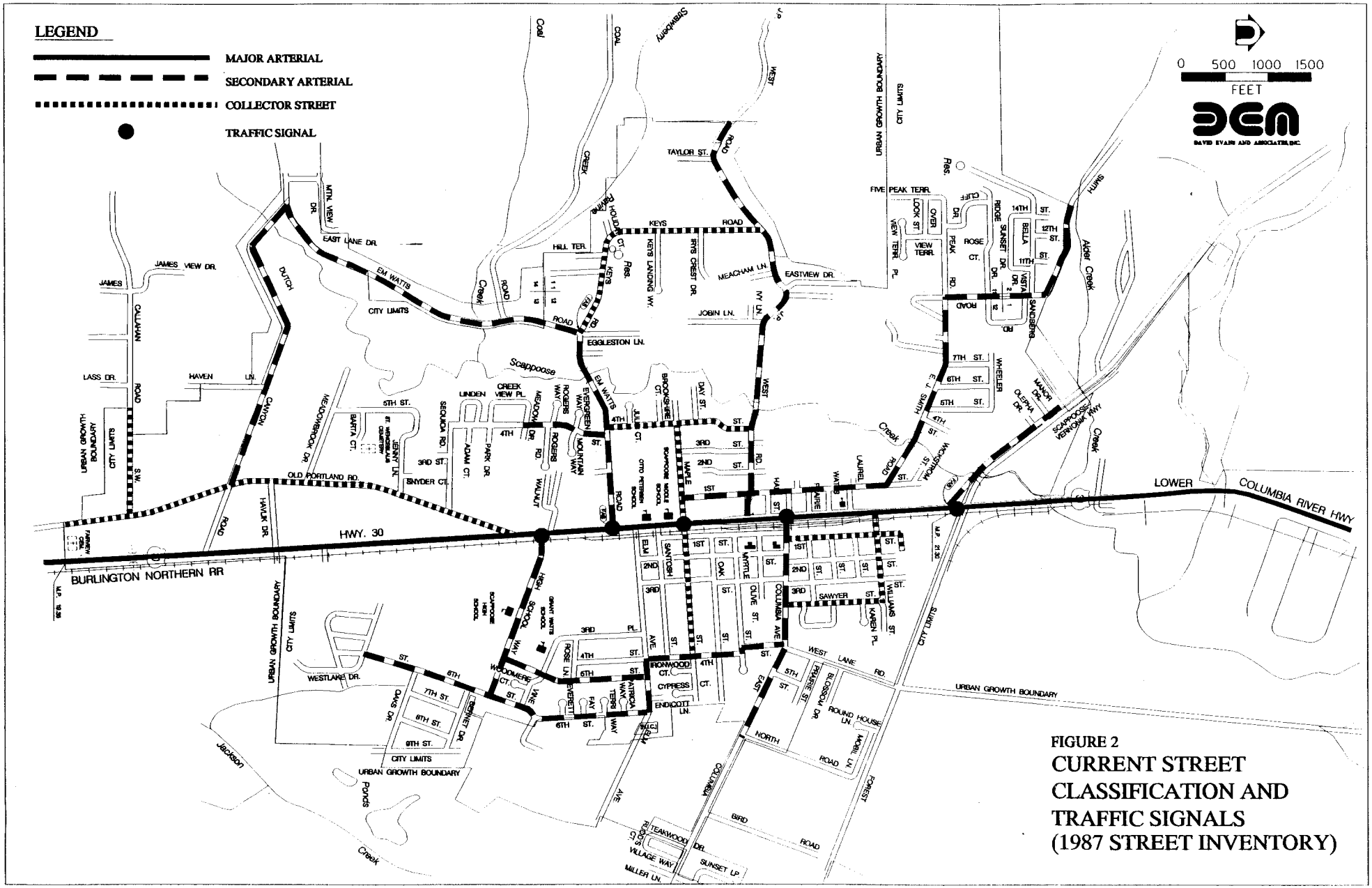


FIGURE 1
STUDY AREA


LEGEND
MAJOR ARTERIAL
SECONDARY ARTERIAL
COLLECTOR STREET
TRAFFIC SIGNAL
0 500 1000 1500
FEET
DAVID EVANS AND ASSOCIATES, INC.
HWY. 30
BURLINGTON NORTHERN RR
LOWER COLUMBIA RIVER HWY
OLD PORTLAND RD.
TAYLOR ST.
KEYS ROAD
EGGLESTON LN.
EASTVIEW DR.
JOBIN LN.
MEACHAM LN.
EAST LANE DR.
E.M. WATTS ROAD
CITY LIMITS
URBAN GROWTH BOUNDARY
FIVE PEAK TERR.
WESTLAKE DR.
ROUND HOUSE LN.
BIRD ROAD
NORTH ROAD
SUNSET LP
MILLER LN.
VILLAGE WAY
TEAKWOOD DR.
Scappoose Creek
Coal Creek
Jackson Ponds
Res.
FIGURE 2
CURRENT STREET CLASSIFICATION AND TRAFFIC SIGNALS (1987 STREET INVENTORY)

The management objective of Statewide Highways is to provide for safe and efficient high-speed continuous-flow operation in rural areas and high to moderate-speed operations with limited interruptions of flow in urban and urbanizing areas.

Arterial Roadways. Arterial streets form the primary roadway network within and through a region. They provide a continuous road system which distributes traffic between neighborhoods and districts. Generally, arterial streets are high capacity roadways which carry high traffic volumes with minimal localized activity. Major arterial streets tend to be higher volume, larger capacity roadways than minor arterial streets.

In Scappoose, the collector and arterial network consists of state, county, and city streets. Highway 30 is the only major arterial street in Scappoose. It runs north-south through the center of town, and it is the primary corridor of commercial development.

Secondary arterial streets include: Scappoose-Vernonia Highway, E.J. Smith Road, First Street West, J.P. West Road, E.M. Watts Road, Dutch Canyon Road, East Columbia Avenue, Elm Avenue, High School Way, Fourth Street East, Fifth Street East, and Sixth Street East.

Collector Roadways. Collector streets connect local neighborhoods or districts to the arterial network. Generally, they do not connect together to form a continuous network because they are not designed to provide alternative routes to the arterial street system.

Both Scappoose and Columbia County have designated collector roads. Collector streets in the planning area include Old Portland Road, Maple Street, Williams Street, Sawyer Street, Keys Road, Fourth Street West, First Street East, and Fourth Street East.

Scappoose is characterized by several natural and man-made features that form a barrier to vehicular travel. These include Highway 30, the railroad on the east side of Highway 30, and Scappoose Creek on the west side of Highway 30.

Highway 30 carries between 16,000 and 23,000 vehicles daily, forming a barrier to travel between the east and west sides of the city. Access from the west side is provided at several cross-street locations; however, access from the east side is restricted to a few streets that cross the railroad (discussed in the following paragraph). The intersections of Highway 30 with High School Way, E.M. Watts Road, Maple Street, East Columbia Avenue, and the private Forest Road are currently controlled by traffic signals.

The railroad interrupts east-west streets on the east side of the highway. Access from the east side of the city to Highway 30 is restricted to a few streets that cross the railroad. These include the private Forest Road and Williams Street at the north end, High School Way at the south end, and Columbia Avenue, Maple Street, Santosh Street, and Elm Street in the central part of the city.

The creek interrupts east-west travel on the west side of the city, and it is crossed by E.J. Smith Road at the north end, Dutch Canyon Road at the south end, and J.P. West Road and E.M. Watts Road near the central part of the city. All east-west travel in the city on the west side of Highway 30 is funneled through these four streets, classified as secondary arterials in the 1987 street inventory.

A major problem in Scappoose is not the location of Highway 30 through the center of town, but the lack of continuous east-west streets across the highway. Although traffic signal control is provided at several locations along the highway, Maple Street is the only street that provides continuous east-west access from both directions across Highway 30. In addition, Columbia Avenue provides continuous access from the west; however, continuous east-west access for westbound traffic is restricted as Columbia Avenue is a narrow one-way street west of Highway 30. The lack of continuous east-west streets across Highway 30 increases congestion on the highway as it necessitates highway travel for most local trips.

The street system in Scappoose is also characterized by the absence of continuous north-south routes that could provide an alternative to travel on Highway 30.

Current Traffic Volumes

Traffic volumes along Highway 30 peak twice during the day, once during the morning commute hour between 6:00 AM and 8:00 AM and then during the afternoon commute hour between 4:00 PM and 6:00 PM. The traffic volume is highest during the afternoon peak hour, and it is equal to approximately 8 percent of the daily traffic. The traffic volume during the morning peak hour is approximately 85 percent of the afternoon peak hour traffic volume. During mid-day, in the time period between the morning and afternoon peak commute periods, traffic volumes generally vary to between 65 and 75 percent of the peak hour traffic volume during the afternoon commute peak hour. The hourly trend in traffic volumes along Highway 30 is illustrated in Figure 3 at MP 20.90, located just south of Columbia Avenue.

Traffic volumes on the major streets in Scappoose were measured during the summer of 1995. Two-way vehicular traffic volumes during the weekday PM peak on the city's major street system are shown on Figure 4. The widest bandwidth illustrates that the highest volumes occur on Highway 30 (Major Arterial), with about 1,975 vehicles per hour (vph) at the south end of the city and 1,705 vph at the north end of the city. Other major streets in the city currently carrying relatively higher traffic volumes during the weekday PM peak include E.M. Watts Road carrying 355 vph (Secondary Arterial), Scappoose-Vernonia Highway carrying 345 vph (Secondary Arterial), and East Columbia Avenue carrying 300 vph (Secondary Arterial).

Through Traffic

Through traffic volumes along Highway 30 were measured by comparing license plates of vehicles entering and exiting the city during the weekday afternoon peak period. Recorders were stationed along Highway 30 at two locations, one just south of the city, and the other north of the city. Additional recorders were stationed along Old Portland Road south of the city and along Scappoose-Vernonia Highway west of the city. Vehicles that passed through the city in under 15 minutes were considered to be through traffic.

During the weekday PM peak hour, through traffic constituted 45 percent of the traffic in the northbound direction along Highway 30 and through traffic constituted 55 percent of the traffic in the southbound direction. Of the traffic entering the city from the west along Scappoose-Vernonia Highway, 45 percent was measured to be through traffic. The through traffic measured during the current weekday PM peak hour is illustrated in Figure 5.

Based on the calibrated travel demand forecasting model, 3,620 vehicular trips are estimated to use the study area street system during the weekday PM peak hour. Of the 3,620 vehicular trips, 1,020 trips are estimated to pass

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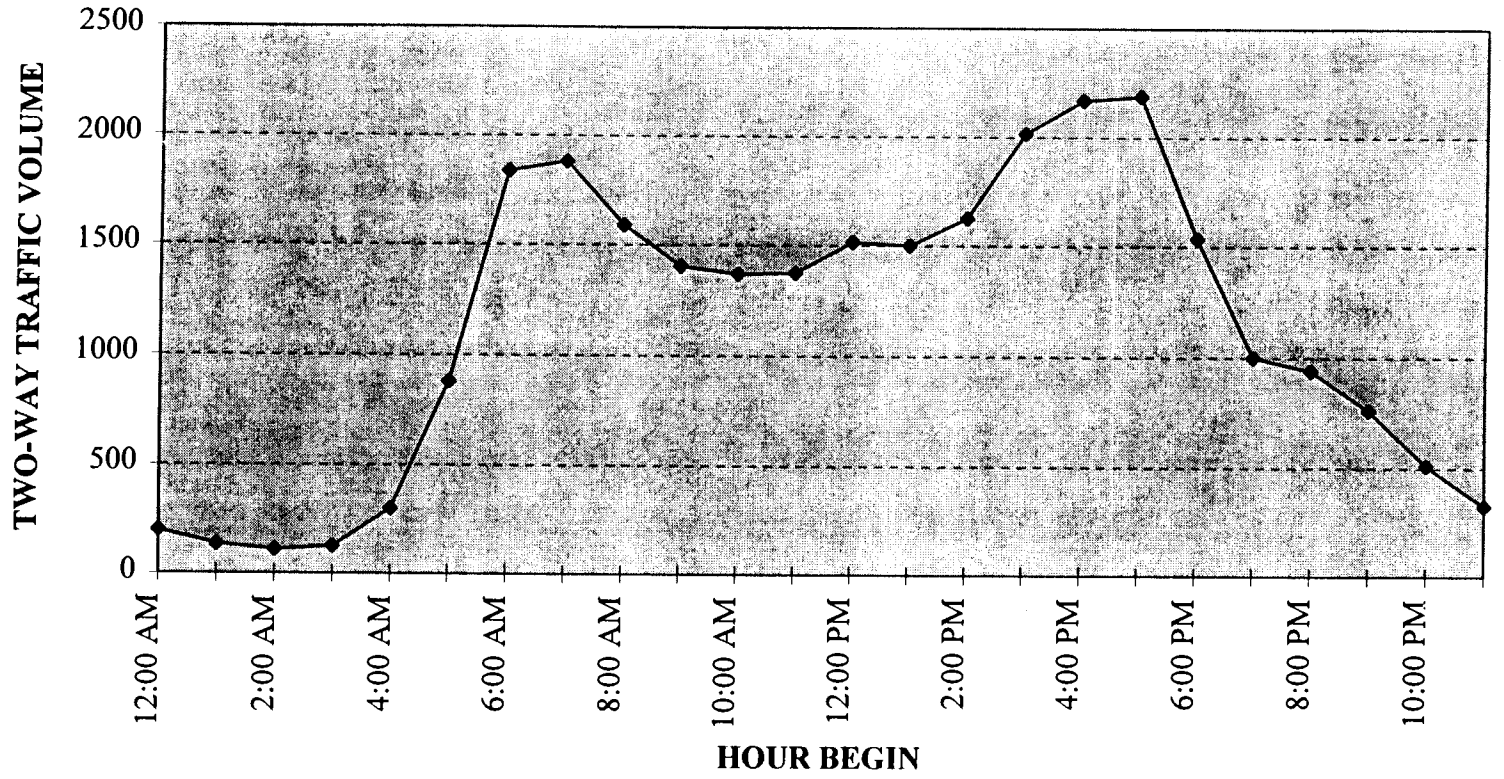


FIGURE 3

HOURLY TREND IN TRAFFIC VOLUMES ALONG HIGHWAY 30 AT MP 20.90 (JUST SOUTH OF COLUMBIA AVENUE)

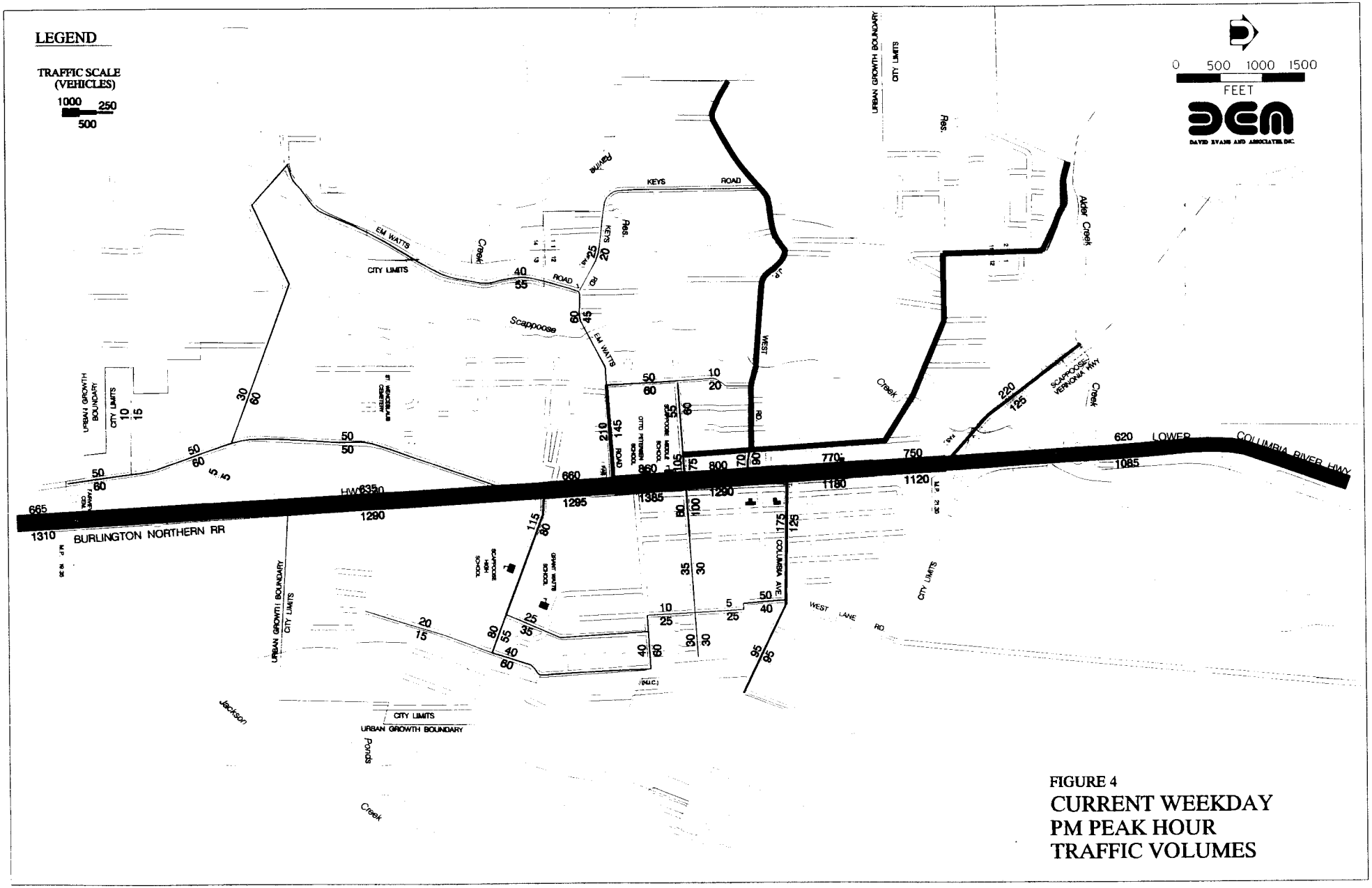
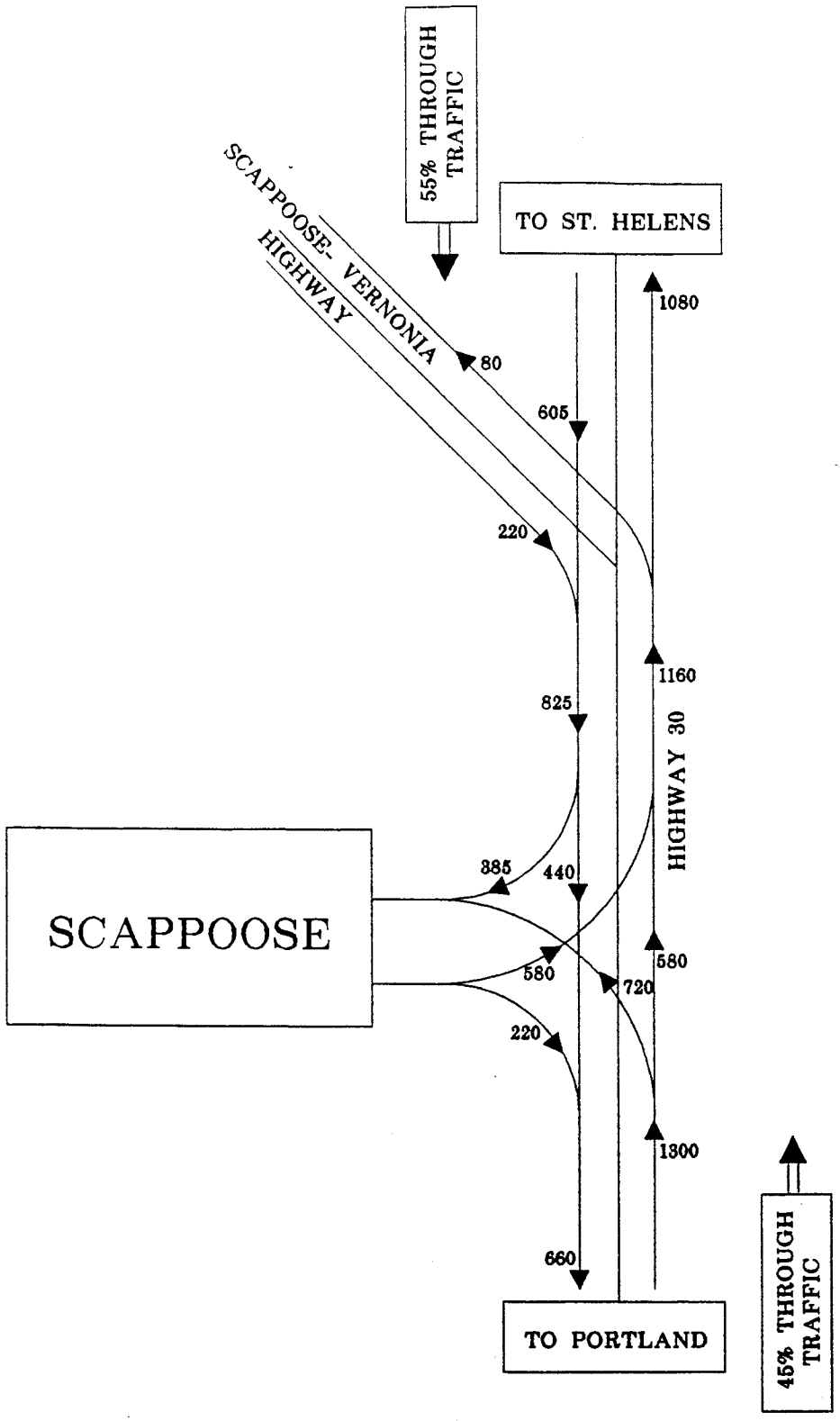


FIGURE 4
CURRENT WEEKDAY
PM PEAK HOUR
TRAFFIC VOLUMES



DAVID EVANS AND ASSOCIATES, INC.

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FIGURE 5
CURRENT WEEKDAY PM PEAK HOUR THROUGH TRAFFIC VOLUMES

through the study area and another 1,900 vehicular trips are estimated to have either an origin or a destination outside the study area. The remaining 700 vehicular trips are estimated to have both the origin and destination within the study area.

Average Trip Lengths

Of the 700 internal vehicular trips (i.e. having both the origin and destination within the study area) during the weekday PM peak hour, almost all trips were 3 miles or less in length. The average trip length distribution for internal trips is illustrated in Table 1.

Of the trips which are entirely within the study area, almost all trips were 3 miles or less in length. Approximately 20 percent were less than 1/2 mile in length, a distance which could be covered by a pedestrian in less than 15 minutes. More than 55 percent of the trips within the city were less than 1 mile in length, a distance which could be covered by a pedestrian in less than 25 minutes and a bicyclist in less than 10 minutes. Another 35 percent of the trips are between 1 and 2 miles in length, and about 9 percent of the trips are between 2 and 3 miles in length. Any of these trips (99 percent of the total within the city) would take a bicyclist traveling 10 mph less than 20 minutes, while a bicyclist traveling half that speed would take a maximum of 35 minutes.

TABLE 1
CURRENT AVERAGE TRIP LENGTHS

Trip Type/Length	Number of Trips	Percentage of Total	Percentage of Total within Scappoose
Both trip ends within study area			
Less than 1/4 mile	60	2	9
Between 1/4 and 1/2 mile	80	3	11
Between 1/2 and 1 mile	245	10	35
Between 1 mile and 2 miles	250	10	35
Between 2 miles and 3 miles	60	2	9
More than 3 miles	5	0	1
Subtotal	700	19	100
One trip-end outside study area	1,900	53	N/A
Both trip-ends outside study area	1,020	28	N/A
Total Trips	3,620	100	N/A

Current Street Capacity

Transportation engineers have established various standards for measuring traffic capacity of roadways or intersections[1]. Each standard is associated with a particular level of service (LOS) one wishes to provide. The LOS concept requires consideration of factors which include travel speed, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort and convenience and operating cost. Six standards have been established ranging from Level A where traffic flow is relatively free to Level F where the street system is totally saturated or jammed with traffic. Table 2 presents the level of service criteria for arterial and collector streets.

[1] Transportation Research Board, *Highway Capacity Manual*, Special Report 209. National Research Council, 1985.

The OHP establishes operating level of service standards for the state highway system[2]. For highways of statewide importance, such as the Highway 30, roadways in urban areas and urbanizing areas should operate at LOS C or better (i.e. stable traffic flow with average speeds between 20 and 25 mph). The capacity of each of the major streets was calculated in a generalized way to compare with the PM peak hour traffic volumes to determine locations of capacity deficiencies. These capacities represent a condition bordering between LOS E and LOS F. Roadways with volumes less than 70 percent of the capacity are operating at LOS C or better, those with volumes between 70 and 85 percent capacity are operating at LOS D, those with volumes between 85 and 100 percent capacity are operating at LOS E, and those with volumes greater than the capacity are operating at LOS F.

TABLE 2
LEVEL OF SERVICE CRITERIA FOR ARTERIAL AND COLLECTOR STREETS

Service Level	Typical Traffic Flow Conditions
A	Relatively free flow of traffic with some stops at signalized or stop sign controlled intersections. Average speeds would be at least 30 miles per hour.
B	Stable traffic flow with slight delays at signalized or stop sign controlled intersections. Average speed would vary between 25 and 30 miles per hour.
C	Stable traffic flow with delays at signalized or stop sign controlled intersections. Delays are greater than at level B but still acceptable to the motorist. The average speeds would vary between 20 and 25 miles per hour.
D	Traffic flow would approach unstable operating conditions. Delays at signalized or stop sign controlled intersections would be tolerable and could include waiting through several signal cycles for some motorists. The average speed would vary between 15 and 20 miles per hour.
E	Traffic flow would be unstable with congestion and intolerable delays to motorists. The average speed would be approximately 10 to 15 miles per hour.
F	Traffic flow would be forced and jammed with stop and go operating conditions and intolerable delays. The average speed would be less than 10 miles per hour.

Source: *Transportation Research Board, Highway Capacity Manual, Special Report 209. National Research Council, 1985.*
Note: The average speeds are approximations observed at the various levels of service but could differ depending on actual conditions.

For two-lane roadways, which comprise most of the Scappoose street network with the exception of Highway 30, capacity was estimated at about 700 vehicles per hour in each direction. These capacity estimates do not specifically address intersection operations. Comparing these general capacity estimates with the 1992 weekday PM peak hour traffic volumes illustrated in Figure 4 shows that all of the two-lane streets in Scappoose are operating at LOS C or better, indicating little or no congestion.

The capacity of five-lane major arterial roadways, such as Highway 30, is highly dependent on the turning volumes off of the highway and the cross-street approach volumes at signalized intersections. Currently, all five signalized intersections along Highway 30, at Scappoose-Vernonia Highway, Columbia Avenue, Maple Street, E.M. Watts Road, and High School Way are estimated to operate at LOS C or better during the weekday PM peak hour (see Table 3).

[2] 1991 Oregon Highway Plan, Appendix A, Table 1, *Operating Level of Service Standards for the State Highway System.*

At the stop-controlled intersection of Highway 30 and Old Portland Road, the left-turn from the stop-controlled Old Portland approach operates at a LOS F during the weekday PM peak hour. All other movements at the intersection with Old Portland Road operate at LOS B or better during the weekday PM peak hour.

TABLE 3
CURRENT WEEKDAY PM PEAK HOUR LEVELS OF SERVICE

Intersection		Level of Service
Highway 30 and Old Portland Road (north end)		
	NB Left	B
	EB Left	F
	EB Right	A
Highway 30 and High School Way/Walnut Road		0.53 A
Highway 30 and E.M. Watts Road		0.68 C
Highway 30 and Maple Street		0.67 C
Highway 30 and Columbia Avenue		0.64 B
Highway 30 and Scappoose-Vernonia Highway		0.45 A

Current Traffic Safety Conditions

Accident data was collected for traffic accidents in the Scappoose urban area for the three-year period from January 1, 1992 through December 31, 1994. The results of the analysis are summarized in Table 4 for intersections in the Scappoose urban area with three or more accidents that are intersection-related during the three-year period. The overall number of traffic accidents along Highway 30 within Scappoose city limits are summarized in Table 5, and compared to the statewide accident rate for similar highways.

The summary of intersection-related traffic accidents indicates that the average annual intersection accident rate at intersections along Highway 30 in Scappoose is lower than national averages for comparable intersections. Available research indicates that the average is somewhere in the range between 1.0 and 1.25 accidents per million entering vehicles (acc/mev) for signalized intersections with more than 20,000 daily entering vehicles, and it is somewhere in the range between 0.5 and 1.0 acc/mev for stop-controlled intersections. The intersection of Highway 30 and E.M. Watts Road with nine accidents had the highest total number of accidents as well as accident rate during the three-year period.

TABLE 4
INTERSECTION-RELATED TRAFFIC ACCIDENTS

Intersection	Number of Accidents	Intersection Accident Rate in acc/mev[3]
Highway 30 and Old Portland Road (north end)	3	0.33
Highway 30 and High School Way/Walnut Road	6	0.63
Highway 30 and E.M. Watts Road	9	0.83
Highway 30 and Columbia Avenue	4	0.39
Highway 30 and Watts Street	4	0.43
Highway 30 and Scappoose-Vernonia Highway	5	0.44

[3] ACC/MEV = Accidents per million entering vehicles.

TABLE 5
TRAFFIC ACCIDENT RATE ALONG HIGHWAY 30

Year	Number of Accidents	ADT	Accident Rate (acc/mvm)[4]	Statewide Average (acc/mvm)[5]
1992	16	18,373	1.22	3.69
1993	18	18,373	1.37	3.55
1994	31	18,373	2.37	NA

The summary of total (including intersection and non-intersection related) traffic accidents indicates that the number of accidents as well as the accident rate along Highway 30 has been increasing in the period from 1992 to 1994. However, at 2.37 accidents/million vehicle miles (acc/mvm), the accident rate along Highway 30 through Scappoose is still lower than the most recent statewide average for similar highways through urban areas (3.55 acc/mvm).

TRAVEL MODE DISTRIBUTION

As in most smaller urban communities in the United States, the automobile is the primary mode of travel for most residents in the Scappoose urban area. Journey-to-work data from the US Census indicates that currently 95 percent of the work trips take place via the automobile mode, with the remaining five percent accounted for mainly by walking trips and by those who work at home (see Table 6).

TABLE 6
MODAL SPLIT OF JOURNEY-TO-WORK TRIPS

Trip Type	Percent Mode Split	
	Scappoose Area	National Average
Private Vehicle	95%	86%
Drove Alone	(82%)	(73%)
Carpooled	(13%)	(13%)
Public Transportation	0%	5%
Bicycle	< 1%	1%
Walk	3%	4%
Other	< 1%	1%
Work at Home	1%	3%
Total	100%	100%

The journey-to-work census data for 1990 indicated that 82 percent of the journey-to-work trips in the Scappoose area are the drive-alone type. Of the remaining 18 percent of the journey-to-work trips, 13 percent use carpools, 3 percent walked to work, 1 percent worked at home, and less than 1 percent biked to work or used other travel modes.

[4] ACC/MVM = Accidents per million vehicle miles.

The census data includes only travel mode distribution for journey-to-work trips. However, peak period traffic consists of journey-to-work trips and trips for non-work related purposes. During the peak periods, automobiles are estimated to carry 97 percent of the total trips in the Scappoose urban area, with the remaining three percent by a mode other than the automobile. Of the 97 percent carried by automobiles, 93 percent is estimated to be carried by single-occupant automobiles and the remaining four percent by carpools.

Overall, automobiles (including carpools) are estimated to carry 98 percent of the daily trips in the metropolitan area, with the remaining two percent by a mode other than the automobile. Of the 98 percent carried by automobiles, 96 percent is estimated to be carried by single-occupant automobiles and the remaining two percent by carpools.

PEDESTRIAN FACILITIES

The use of walking as a mode of transportation is minimal in the Scappoose area, restricted mainly to school children walking to and from school and walking to and from commercial retail areas by neighborhood residents. Most of the city's arterial and collector roadways, with the exception of Highway 30, do not have any sidewalks for pedestrians (see Figure 6). Highway 30 has sidewalks on both sides of the road, between High School Way and Williams Street. Sidewalks are provided on only the west side of Highway 30 in Scappoose, between Williams Street and the Scappoose-Vernonia Highway, and to the south of High School Way.

Some streets such as Old Portland Road, Williams Street, E.M. Watts Road, J.P. West Road, East Columbia Avenue, SE Sixth Street, SW Fourth Street, and NW First Street have sidewalks in some sections and not in others. Often, the sidewalks along these streets are present on one side only. Other streets such as Maple Street, Keys Road, Elm Street, E.J. Smith Road, SE Fourth Street, and NE First Street do not have sidewalks along the entire length. In addition, all of the new residential developments are required to include sidewalks as part of the street.

BICYCLE FACILITIES

Highway 30 is a designated bicycle route running north-south through Scappoose (see Figure 7). The route is mainly used by recreation bicyclists going from Portland to the Oregon Coast. It has six-foot wide bike lanes on each side of the highway. In addition, E.M. Watts Road, between Highway 30 and Fourth Street E. has bike lanes on each side of the street.

PUBLIC TRANSPORTATION

Colco Transportation, operated by the Columbia County Council of Senior Citizens, provides demand-responsive bus service for elderly and disadvantaged citizens in the county. Transportation is provided via two vans operating out of Scappoose, providing transportation to Portland, St. Helens, and throughout Scappoose. One round trip is scheduled every Thursday to the Portland metropolitan area, serving primarily travel needs of the transportation disadvantaged for visits to medical facilities. The fee is by donation.

There is currently no inter-city transit service to Scappoose. Up until recently, Dash-Hound, Inc. (a regional bus service) was serving Scappoose and other communities along Highway 30 by providing two round trips daily, six

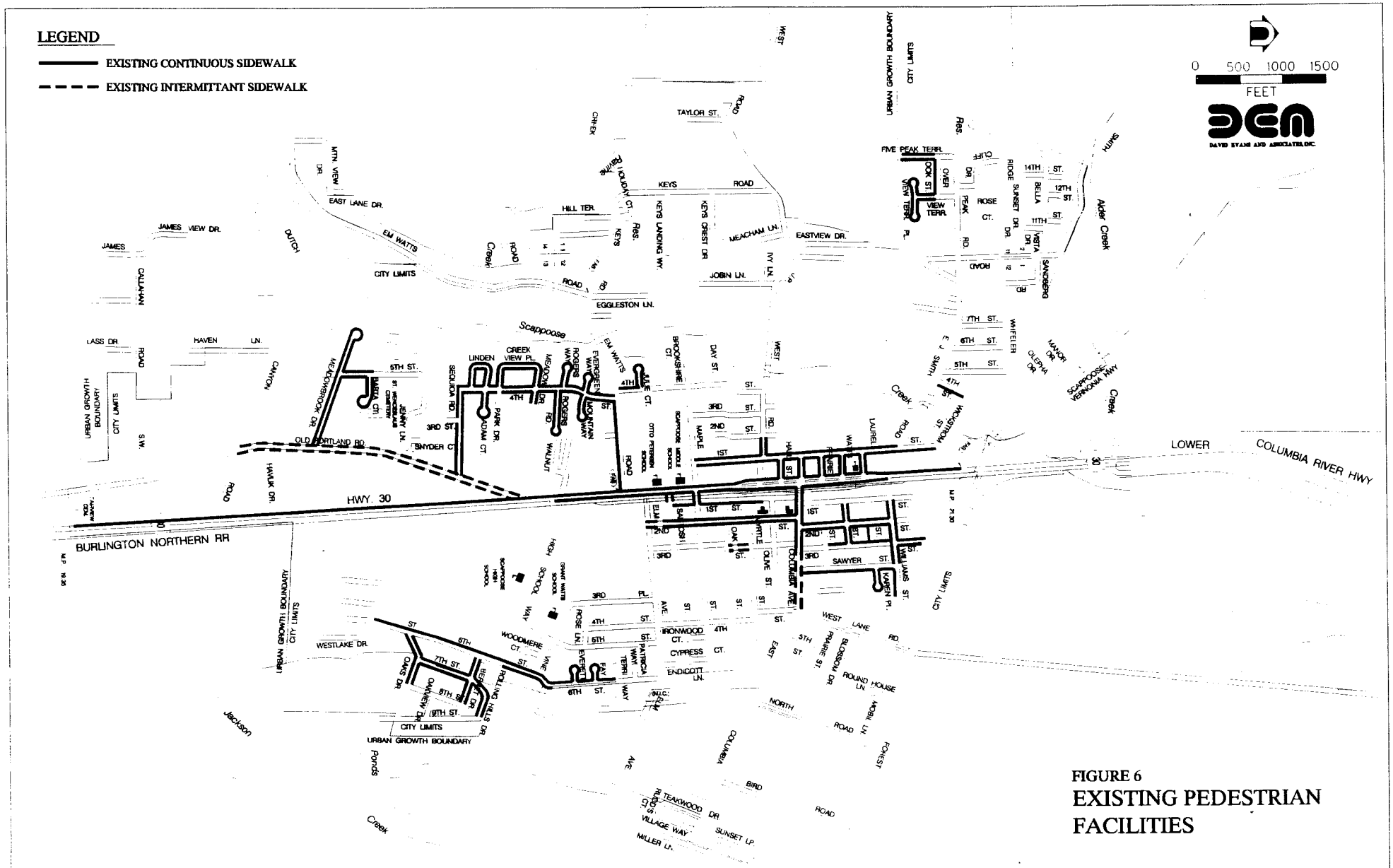
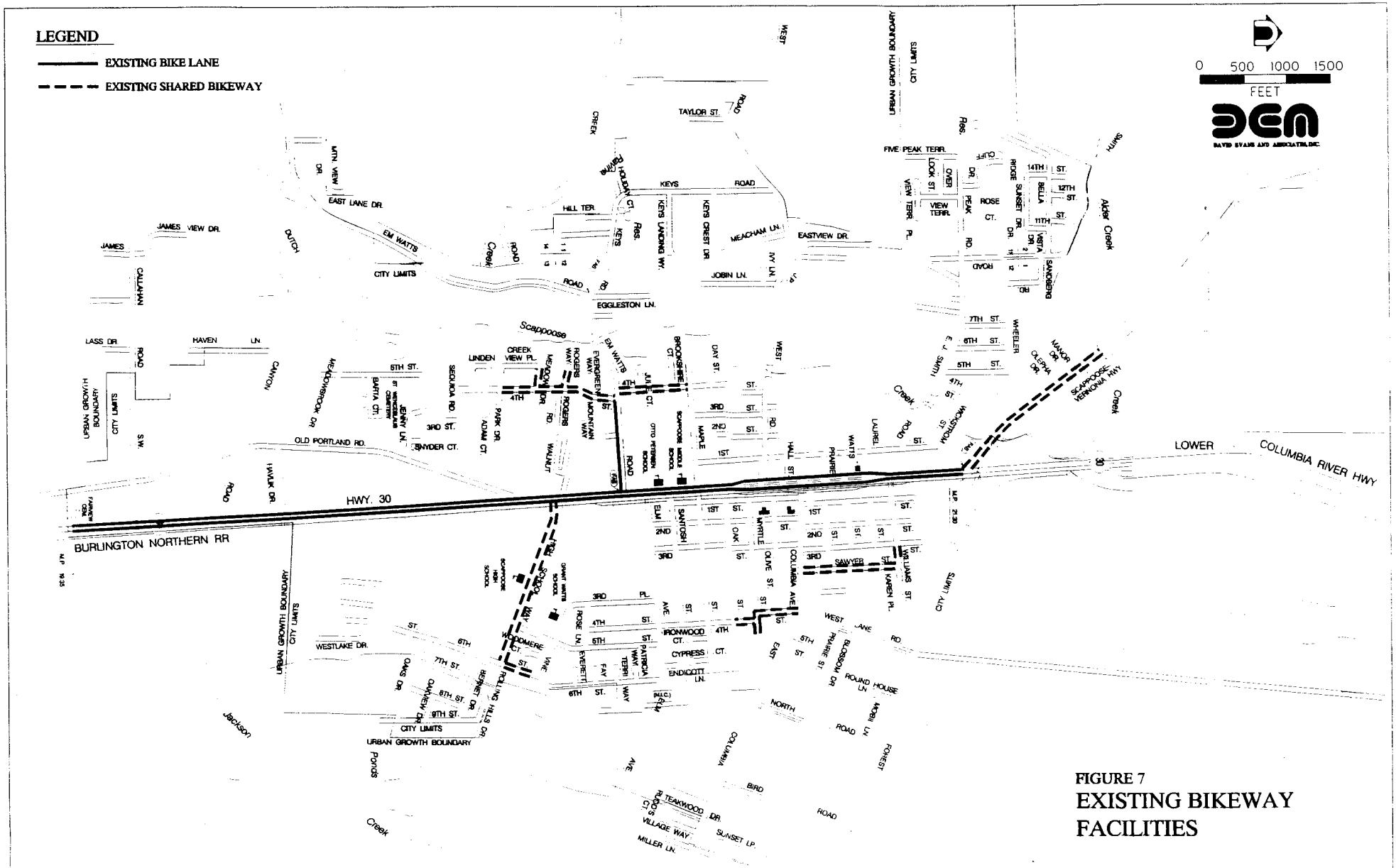


FIGURE 6
EXISTING PEDESTRIAN FACILITIES


LEGEND
EXISTING BIKE LANE
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0 500 1000 1500
FEET
DEA
DAVID EVANS AND ASSOCIATES, INC.
HWY. 30
LOWER COLUMBIA RIVER HWY
BURLINGTON NORTHERN RR
OLD PORTLAND RD.
TAYLOR ST.
KEYS ROAD
EASTVIEW DR.
EGGLESTON LN.
JAMES VIEW DR.
EAST LANE DR.
HILL TER.
JOBIN LN.
FIVE PEAK TERR.
ROSE CT.
SCAPPOOSE
CITY LIMITS
URBAN GROWTH BOUNDARY
WESTLAKE DR.
ROUND HOUSE LN.
NORTH ROAD
Jackson Ponds
Alder Creek
Dutch Creek
E.M. Watts Creek
Res.
FIGURE 7
EXISTING BIKEWAY FACILITIES

days a week (except Wednesdays) between Portland and Astoria. The service was discontinued as of August 1995.

Although there currently are no plans in the short-term to re-institute inter-city transit service to Scappoose along the Highway 30 corridor, ODOT has indicated that a private party has shown interest and it is likely that inter-city transit service along Highway 30 will be re-instituted in the next one to two years.

RAIL SERVICE

There is currently no passenger rail service to the Scappoose urban area. Rail freight service to the area is provided by Portland Western Railroad that operates a railroad through the area, adjacent and on the east side of Highway 30. Currently, the line carries four through train movements per day plus an undetermined amount of switching movements.

Railroad crossings within the city are at-grade. With the present number of train movements per day, only minor inconvenience to traffic circulation exists. If train activity increased drastically, there could be some delay in response time for fire vehicles, as it is often necessary to cross the railroad tracks to get to a fire.

AIR SERVICE

Air service to the study area is provided by the Scappoose Industrial Airpark located to the northeast of the city. The Airpark serves residents of the entire south county area. The Airpark is classified as a general aviation airport, thereby accommodating private planes used in business and recreation. The Airport does not currently handle passenger service or air cargo on a scheduled basis.

WATER SERVICE

Scappoose has no waterborne transportation services within its urban growth boundary (UGB).

PIPELINE SERVICE

Scappoose is served by a major natural gas distribution line. The pipeline parallels US Highway 30 from Portland, and is operated by Northwest Natural Gas. There are no anticipated changes expected to be made in the future to this pipeline.

Currently, there are no major water or oil pipelines within the city limits of Scappoose and there are no foreseeable plans to install any major water or oil pipelines in the future.

TRANSPORTATION DEMAND MANAGEMENT

Though they are not alternative modes, transportation demand management measures such as carpooling, flexible work hours, and telecommuting also contribute to a reduction in peak hour, single occupancy vehicle activity.

Currently, ODOT's Rideshare Program Office maintains a statewide carpool matching program to aid commuters in ridesharing. Per information from ODOT, eighteen people in Scappoose are registered in the program. The state numbers, however, do not include informal carpooling by Scappoose residents. Per the 1990 census, carpooling accounted for thirteen percent of the journey-to-work trips by Scappoose residents.

There are currently no large industrial employers in the Scappoose urban area; thereby staggered work shifts and other such alternative work arrangements are not anticipated to have a significant demand on travel demand in Scappoose.

FUTURE TRAVEL DEMAND

The travel demand on the study area collector and arterial street system was forecast based on the land use and roadway designations contained in the existing City of Scappoose Comprehensive Plan. The travel demand was forecast during the PM peak hour of a typical weekday in 2015, using the computer modeling program TMODEL2[5]. The weekday PM peak hour was modeled as it represents the critical time period of traffic operations for most of the city's collector and arterial street system. Average weekday daily traffic demand was determined assuming that an average of eight percent of the daily traffic occurs during the PM peak hour.

The first step in projecting travel demand involved definition of the study area, including the development of traffic analysis zones (TAZs) and the collector and arterial streets being modeled. Next, future population and employment figures were estimated by TAZ, and productions and attractions were calculated for each TAZ based on standard trip generation rates. The production and attraction trips were then distributed between TAZs, and the trips were then assigned to the study area collector and arterial street system. The following describes each step in the modeling process, and outlines the key assumptions for the City of Scappoose.

STUDY AREA DEFINITION

The first step in modeling requires defining the study area. For this definition, a roadway network and traffic analysis zone system which accurately represent the road system and density of land use activity in the study area were developed.

Roadway System Network

The limits of the roadway system network for the city were defined by the Urban Growth Boundary (UGB). Within this boundary, a network composed of arterial and collector roads was selected. This network includes all of the state highways, most of the county roads, and city streets which are vital to the circulation of traffic in Scappoose.

Each roadway in the network has specific distance, speed, and capacity characteristics which are important factors in the traffic forecasting process. These factors help determine the route that a driver takes when traveling between two locations.

Traffic Analysis Zones

In addition to defining the study area network, a traffic analysis zone (TAZ) system was also developed. The TAZ system divides the study area into smaller analysis units which are used to tie land use activity and trip generation to physical locations within the network.

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[5] TMODEL2, Micro-computer software by Professional Solutions, Inc./Metro, 1991.

Within the study area boundaries, 24 TAZs were defined. Physical barriers, land use, and roadway characteristics were factors used to determine the TAZ structure. Whenever possible, the TAZs were developed to have homogeneous land use characteristics because this system results in the most accurate traffic assignment.

Each TAZ is then connected to the network by one or more representative roadways. Since the traffic network does not include every road that exists within the study area, one connector may represent many local roads which are loading onto a collector or arterial street.

Outside of the study area, three zones load traffic from external locations, generally traffic from other cities. These zones produce three types of trips. The first type is through trips which begin in one external zone and end in another external zone but will pass through the city. For example, a vehicle traveling from Portland to Astoria might take Highway 30 through Scappoose. The second type is a trip which begins in the city and ends at another location. An example would be a Scappoose resident who works in the Portland metropolitan area. The last type is a trip which begins at another location and ends in the city; such as someone who lives in Vernonia and works in Scappoose. In the modeling process, the trips traveling to and from these external zones are associated with the actual roads leading into Scappoose.

EXISTING AND FUTURE DEMOGRAPHICS

Once the traffic analysis zone system was defined, both existing and future (2015) land use forecasts were developed. The existing land use was used in the model calibration process. The future land use was the basis for the future travel forecasts.

The land use characteristics which define growth in the city are population and employment. For the travel forecasting model, population was represented by the number of single-family and multi-family dwelling units in each traffic analysis zone. Employment was broken down by type of land use (i.e., retail/commercial, office, industrial, etc.).

During the 20-year planning period, Scappoose will add additional local industrial development in the area around the Scappoose Industrial Airpark. Local retail development will keep pace and in fact increase at approximately one-and-a-half times the rate of increase in population during the 20-year planning period. Office, medical, government and school development is expected to keep pace with the increase in population during the 20-year planning period.

Most residential development is projected to occur in the southern and eastern sections of Scappoose, most (retail) commercial development is projected to occur along the west side of Highway 30, and most industrial development is projected to occur in the northeast area of the city around the Scappoose Industrial Airpark (see Appendix B).

Table 7 contains a summary of existing and future housing and employment by land use category. Appendix C contains the complete forecast by TAZ in Tables 1 through 3 together with a detailed explanation of the land use forecasting process. Also, the TAZ structure is illustrated in the Appendix as Figure 1, and the current and projected land uses are illustrated in the Appendix as Figures 2, respectively.

TABLE 7
CURRENT AND PROJECTED FUTURE POPULATION AND EMPLOYMENT

Land Use	Current (1995)	Forecast 2015	Projected Increase
Single Family Dwelling Units	1,318	2,535	92%
Multi-Family Dwelling Units	388	720	86%
Retail/Commercial Employees	274	654	139%
Office Employees	30	56	87%
Industrial Employees	277	482	74%
Medical Employees	68	124	82%
Government Employees	46	78	70%
School Employees	198	352	78%
Total Population	4,478	8,138	82%
Total Dwelling Units	1,706	3,255	91%
Total Employment	893	1,746	96%

Current Population

The current (1995) population and housing was estimated based upon the 1990 US Census data, available at the census block level. The 1990 census block data was aggregated into study area TAZs to develop the 1990 population and housing data by TAZ. The current population and household estimates were generated by adding to the 1990 data, specific areas that have received notable development since 1990 and assuming relatively moderate annual growth in the rest of the city (0.5 percent). This results in an average annual growth rate in population and housing in the study area of 1.3 percent from 1990 to 1995.

The 1995 population was estimated at 4,478 for the study area. The number of dwelling units in the study area is estimated at 1,706, of which 1,318 (77 percent) are single-family homes and 388 (23 percent) are multi-family units. For the purposes of this study, mobile homes were counted as multi-family units because they typically have a household size similar to that of multi-family units, that is, fewer people live in the typical mobile home or apartment than live in a single-family dwelling. A smaller household is assumed to generate fewer vehicle trips.

Year 2015 Population

The 2015 population was forecast using an average annual compounded growth rate of approximately three percent. This growth rate is the average of the 20- and 25-year historical growth rates based on census counts for the city and Portland State University (PSU) 1994 population estimate. The projected 2015 population for the study area is 8,138.

Population and housing growth will be concentrated in the TAZs most able to accommodate it. Many TAZs in the study area are largely developed and will accommodate only infill or replacement units. Some TAZs, however, contain substantial amounts of vacant buildable land designated for residential use and can accommodate the majority of Scappoose's expected growth. Vacant land was estimated based on information contained in the city's Comprehensive Plan and from discussions with the city planning department. City staff also identified areas more likely to be developed than others; these areas were assumed to be developed before others.

The amount and type (single- or multi-family) of residential development in each TAZ was estimated based on Comprehensive Plan designations and the city's information. Land designated for Suburban Residential development was assumed to develop at a density of approximately four dwelling units per net acre (du/acre). Land designated for mobile home development is expected to develop at approximately 4.5 units per net acre because land under this designation typically develops with a mix of single-family and mobile home units. General Residential land was assumed to develop with both single- and multi-family units, with the majority (75 percent) being single-family and the remainder multi-family. Because this land is closer to the city's center, higher densities, comparable to existing development, were used to project future development. On vacant General Residential land, single-family was assumed to develop at five units per acre and multi-family at 10 units per acre.

Additional dwelling units were added to 1995 estimated dwelling units to determine 2015 totals. Under these assumptions, the study area would contain a total of 3,255 dwelling units. Of these, 2,535 (78 percent) would be single-family dwellings, and 720 (22 percent) would be multi-family dwelling units.

As mentioned above, the future population for the entire study area was calculated using the long-term average annual growth rate of three percent. However, each TAZ will accommodate a different amount of growth. Population for each TAZ was estimated assuming that the average household size would drop to 2.5 from the current 2.65, in agreement with the general trend towards lower household size in the United States.

Current Employment

The current employment in the study area was estimated by TAZ based on field surveys, document research, and telephone interviews. Sources included the City of Scappoose, St. Helens/Scappoose Chamber of Commerce, Oregon Employment Department, and various businesses and agencies located in the study area.

Scappoose currently has an average of 893 non-agricultural jobs in the TSP study area. Employment estimates by type of work are shown in Table 7. The 1995 population-to-employment ratio in the study area is 5.0 to 1, which is higher than average. In most urban areas, the ratio usually falls between 2.1 and 3.0. Lower ratios occur where almost all employment is contained within an urban area and is based primarily in manufacturing, commercial, and service industries. Higher ratios occur where many jobs in an area are resource-based, e.g., in agriculture, forestry, mineral extraction, etc; where a large number of employees commute to work in other areas; or where unemployment is high.

Many residents of Scappoose commute to jobs outside of the city, particularly to St. Helens and Portland. The city's Comprehensive Plan reports that, in 1989, only 29 percent of the resident work force actually worked in Scappoose, the remainder commuted to out-of-town jobs. The high percentage of commuters explains the study area's high population-to-employment ratio.

Year 2015 Employment

The employment forecast for the TSP is not intended to be a full-sector (agricultural and non-agricultural) forecast. The projections do not include agricultural jobs because the TSP is for facilities and improvements within the study area, and agricultural-related trips have only minor impacts on traffic patterns in the study area.

The projected 2015 employment for the study area is 1,746. The forecast 2015 employment estimates by type of work are shown in Table 7.

Future employment is based on several assumptions. Demand for medical, school, and government services depends largely on changes in population. It was assumed that most medical and school employment would increase at approximately the same rate as population - a total of 80 percent over the next 20 years. Government employment will likely increase at a slightly lesser rate if current "government efficiency" concerns continue. Therefore, government jobs were assumed to increase by 70 percent overall.

Commercial, office, and industrial employment was assumed to increase by 20 percent in TAZs that are already developed and contain little or no vacant land. The additional employment would occur through redevelopment and infill.

To calculate future employment in TAZs that are largely undeveloped, the amount of buildable land based on maps contained in the city's Comprehensive Plan was first estimated. Employment was then assigned based on average densities (employees per gross acre) of the expected land use, which was calculated from information contained in the Institute of Transportation Engineers' *Trip Generation* report and from previous demographic studies done for small cities in Oregon.

Vacant land designated in the Comprehensive Plan for industrial use was assigned five employees per acre. Vacant land designated for commercial use was assigned six employees per acre - 80 percent of the employees in commercial (non-office) jobs, and 20 percent in office jobs. Commercial-designated land allows such uses as retail, office, restaurants, hotels, gas stations, etc. For the purposes of this study, employment numbers were estimated for both office and commercial (non-office) jobs.

As with residential development, information from the City of Scappoose was used to determine which areas are expected to develop before others. For example, the Fred Meyer store in the southern part of Scappoose is expected to employ approximately 200 people and will also attract other businesses to that part of town. Industrial firms have expressed interest in locating at the northwest quadrant of the intersection of Highway 30 and the Scappoose-Vernonia Highway, leading to significant new employment in that area.

As mentioned above, the study area's current population-to-employment ratio is 5 to 1. The ratio may decrease somewhat as Scappoose grows and more jobs are available in the city. However, a significant portion of residents will continue to commute to larger employment bases, particularly the Portland area. Based on the assumptions used for the 2015 forecast, the population-to-employment ratio would be approximately 4.7 to 1. The 20-year average annual growth rate for employment would be 3.4 percent, slightly higher than population growth.

TRIP GENERATION

Vehicle trip generation, the next step in the modeling process, is a method of estimating the number and type of trips a specific land use will produce or attract based on historic data and surveys of similar developments. The trip generation estimates were made for each traffic analysis zone in the planning area on the basis of the type and quantity of households and employees. Trip generation rates applied to these land uses were derived from the Institute of Transportation Engineers report, *Trip Generation (Fifth Edition, 1991)*. These rates were modified to reflect generalized land use categories for planning purposes on the basis of experience in other similar sized cities in Oregon and through the travel model calibration process. These trip rates also reflect the existing level of

transit service and use of alternative modes. An increase in transit ridership or use of other modes is not expected to be large enough to have a significant effect on traffic demand and street requirements. These rates are summarized on Table 8.

TABLE 8
TRIP GENERATION ESTIMATES

Trip Type		Trips/Dwelling Unit		Trips/Employee					
		Single-Family	Multi-Family	Retail/Comm.	Industrial	Hospital	Govt. Office	Office	School
Home Based Work	Origin	0.03	0.02	0.10	0.40	0.10	0.68	0.49	0.68
	Destination	0.39	0.27	0.00	0.05	0.00	0.00	0.00	0.00
Home Based Shopping	Origin	0.10	0.07	0.93	0.00	0.00	0.00	0.00	0.00
	Destination	0.19	0.13	0.58	0.00	0.00	0.00	0.00	0.00
Home Based Other	Origin	0.16	0.11	0.00	0.00	0.09	0.00	0.00	0.21
	Destination	0.08	0.06	0.18	0.00	0.03	0.00	0.00	0.10
Non-Home Based	Origin	0.07	0.05	0.58	0.05	0.02	0.16	0.09	0.16
	Destination	0.08	0.06	0.79	0.05	0.06	0.16	0.12	0.35
Total Rates	**Origin**	**0.36**	**0.25**	**1.61**	**.045**	**0.21**	**0.84**	**0.58**	**1.05**
	Destination	**0.74**	**0.52**	**1.55**	**0.10**	**0.09**	**0.16**	**0.12**	**0.45**

Each trip is defined by the land use from which it originates, the land use for which it is destined, and the purpose of the trip. Trip generation rates were refined for each origin and destination for four purposes:

- Home-based work - Trips between home and a place of employment.
- Home-based shopping - Trips between home and a retail center.
- Home-based other - Trips between home and another land use for a purpose other than employment or shopping (e.g., school trips).
- Non-home based - Trips between two non-residential land uses.

The amount of traffic generated for each TAZ was estimated for the PM peak hour by multiplying the number of households or employees by the appropriate origin and destination trip generation rate by trip purpose. Trip origins and destinations were also calculated for the three external roadways leading into Scappoose. These trip calculations are based on historic growth along the roadways and potential increases in population and/or employment outside of the Urban Growth Boundary.

TRIP DISTRIBUTION

Vehicle trip distribution, the fourth step in the modeling process, is a method of determining the origin and destination of trips within the study area. For each TAZ, trip origins were distributed to all of the trip destinations within the planning area and to the roads leading out of the study area. (Trip origins were also calculated for the roads leading into the area.)

A standard gravity model was used for trip distribution. The basic premise of the gravity model is that the number of trips between two areas is directly related to the size of the attractions or destinations in each zone and inversely related to the travel time between zones. For example, if two destination zones of equal size were located 10 and 15 minutes from the origin zone, more of the trips from the origin zone would be distributed to the closer destination zone. Likewise, if two destination zones of different sizes were located equal driving times from the origin zone, more trips would be distributed to the larger destination zone. This procedure was followed for trips originating in all 24 internal zones and the roads leading into the study area.

TRIP ASSIGNMENT

Trip assignment, the final step in the modeling process, is a method of assigning trips distributed between origin zones and destination zones to specific paths on the street system. The forecasting model used a capacity-constrained assignment methodology which assigns traffic in percentage increments to the street system based on travel time. For the first increment, each trip is assigned to the shortest route between its origin and destination based on travel time. The travel time on each route is then adjusted to account for congestion and delay which may result from the first incremental assignment. As the fastest route becomes congested, its travel time increases, possibly making a previously slower route the faster of the two. For the second increment of traffic, each trip follows the same guidelines and is assigned to the shortest route, and then travel times are readjusted to account for the new level of congestion. This process continues until all the increments have been assigned. Using this procedure, the traffic between a single origin/destination pair could be assigned to several routes depending on the congestion of each route, thereby simulating "real world" motorists' choices on a travel route.

Model Calibration

Prior to assigning 2015 traffic, this entire process of estimating trip generation, distribution, and assignment was completed for 1995 conditions and compared with actual measurements on the roadway system. The theory behind calibration reasons that if the modeling process forecasts current conditions reasonably well, the same process should then provide a reasonably good estimate of future conditions.

To calibrate the model, the trip generation, distribution, and assignment process was repeatedly modified until the assigned volumes were within approximately ten percent of the actual counts. The data collected from the phone surveys were used in the calibration procedure to adjust the trip distribution process. Roadway speed was the key factor used to adjust the trip assignment process. In addition, data on through traffic was also used to calibrate the model.

Future Assignments

With the increase in population and employment in Scappoose, through traffic along Highway 30 through Scappoose will constitute a smaller percentage than the current proportion. During the weekday PM peak hour in 2015, through traffic is estimated to constitute 28 percent of the traffic in the northbound direction along Highway 30 and through traffic is estimated to constitute 55 percent of the traffic in the southbound direction. Of the traffic entering the City from the west along Scappoose-Vernonia Highway, 44 percent is estimated to be through traffic during the weekday PM peak period (see Figure 8).

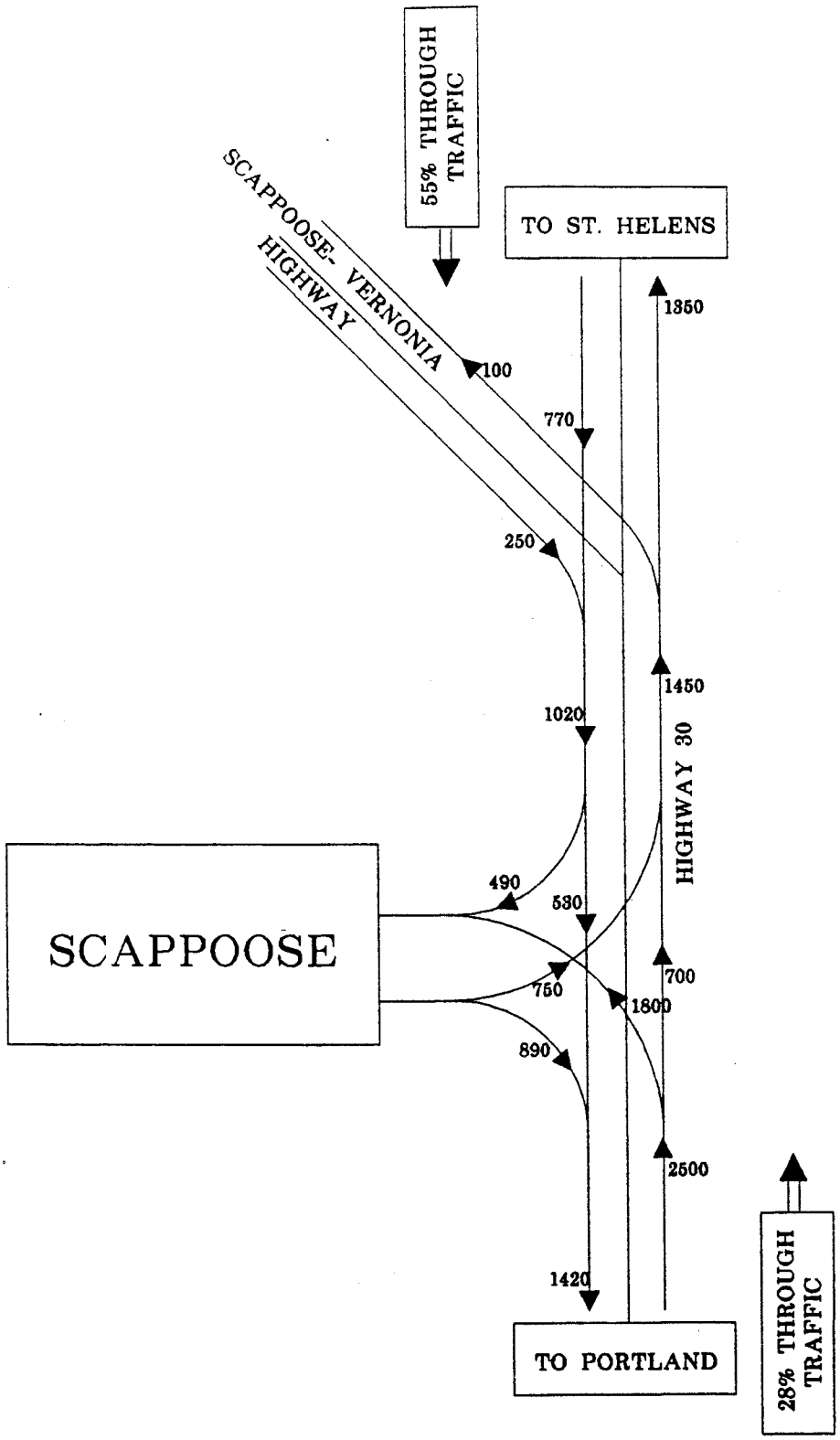

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FIGURE 8
FORECAST 2015 WEEKDAY PM PEAK HOUR THROUGH TRAFFIC VOLUMES

During the 2015 weekday PM peak hour, 6,490 vehicular trips are estimated to use the study area street system during the weekday PM peak hour. Of the 6,490 vehicular trips, 1,340 trips are estimated to pass through the study area and another 3,930 vehicular trips are estimated to have either an origin or a destination outside the study area. The remaining 1,220 vehicular trips are estimated to have both the origin and destination within the study area. The estimated trip generation at the internal and external zones was then assigned to the existing street system, and the resulting 2015 traffic volume forecast for the "No Build" scenario is illustrated in Figure 9.

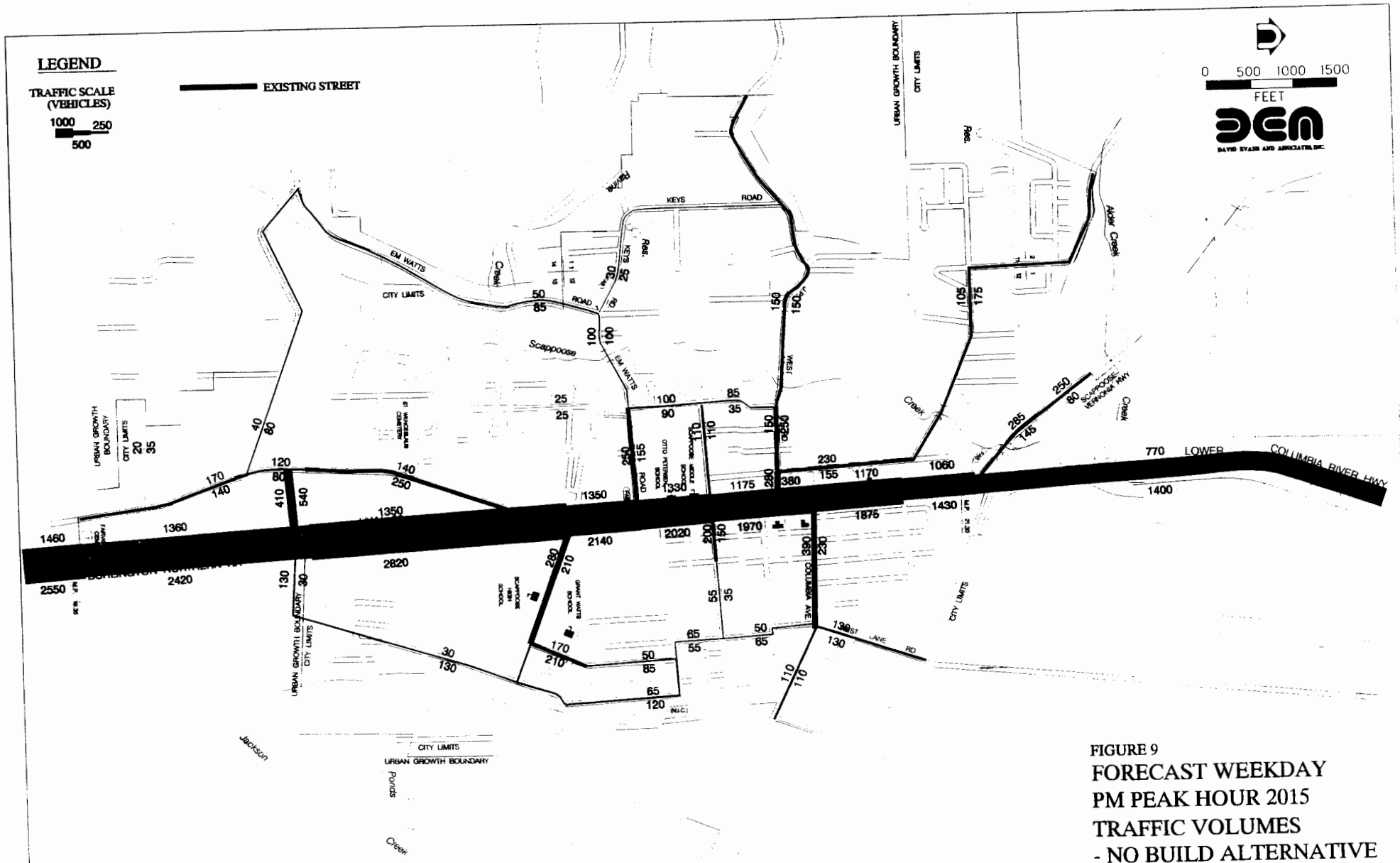

FIGURE 9
FORECAST WEEKDAY
PM PEAK HOUR 2015
TRAFFIC VOLUMES
- NO BUILD ALTERNATIVE

TRANSPORTATION IMPROVEMENT OPTIONS ANALYSIS

NO BUILD SCENARIO

The "No Build" scenario establishes the baseline for all other analyses. This scenario assumes that no major changes would be made to the existing transportation system for the next 20 years. However, traffic volumes would increase in Scappoose as population and employment nearly double by the year 2015. By comparing future demand with the unchanged transportation system, one can determine where future problems are likely to occur.

The travel forecasting model and population and employment data used to forecast the weekday PM peak hour traffic volumes in 2015 were described in detail in the previous section. The forecast 2015 weekday PM peak hour traffic volumes are illustrated in Figure 9.

As illustrated in Figure 9, forecast vehicular traffic volumes along Highway 30 south of Scappoose are projected to increase from the current 1,975 vehicles during the weekday PM peak hour to 4,010 vehicles by 2015 (at an average annual rate of 3.6 percent). In the central part of town, between Maple Street and Columbia Street, vehicular traffic volumes are projected to increase from the 2,090 vehicles during the weekday PM peak hour to 3,145 vehicles by 2015 (at an average annual rate of 2.1 percent). Traffic volumes along city streets are projected to increase by between 50 and 250 percent, with the highest volume increases projected along Old Portland Road (from the current 110 to 390 peak hour traffic volumes by 2015), Columbia Avenue East (from 300 to 620 vehicles), High School Way (from 195 to 490 vehicles), and Maple Street (from 160 to 350 vehicles).

From the travel demand forecasting model for 1994 and 2015, average trip length was estimated (Table 9). The percentage of through trips, trips with only one trip-end inside the Scappoose study area, and trips with both trip-ends within the study area is similar between 1995 and 2015. However, the distribution of trip distances may change substantially over the next twenty years if current land use patterns are continued.

TABLE 9
FUTURE AVERAGE TRIP LENGTHS

Trip Type/Length	Forecast 2015 Conditions		
	Number of Trips	Percentage of Total	Percentage of Total within Scappoose
Both trip ends within study area			
Less than 1/4 mile	90	2	8
Between 1/4 and 1/2 mile	105	2	9
Between 1/2 and 1 mile	345	7	28
Between 1 mile and 2 miles	475	9	39
Between 2 miles and 3 miles	190	4	15
More than 3 miles	15	1	1
Subtotal	1220	19	100
One trip-end outside study area	3,930	60	N/A
Both trip-ends outside study area	1,340	21	100
Total Trips	6,490	100	100

In 1995, 91 percent of the vehicle trips that are entirely within the planning area are estimated to be two miles or less in length, and 55 percent are estimated to be under one mile in length. By 2015, only 84 percent of the vehicle trips that are entirely within the planning area are estimated to be two miles or less in length, and 45 percent are estimated to be under one mile in length. This increase in the average trip length is attributed to future developments that would be located farther away from the central area of the city.

The increase in average trip length would lead to a much greater increase in the number of vehicle miles traveled (VMT) than the projected increase in population, employment, and number of vehicle trips. Thus, although the number of trips is estimated to increase by approximately 75 percent, the higher average trip length is estimated to result in total VMT in the city increasing by approximately 105 percent.

With the projected increase in traffic volumes along Highway 30 during the weekday PM peak hour, existing signalized intersections along the highway are estimated to operate at below the LOS C threshold established for this segment of Highway 30 under the *1991 Oregon Highway Plan*. Specifically, the intersection of Highway 30 with High School Way/Walnut Road and the intersection with Havlik Drive are estimated to operate at close to capacity and at LOS E during the weekday PM peak hour in 2015. Also, the intersection of Highway 30 and E.M. Watts Road is estimated to operate at between LOS D and E, and the intersection of Highway 30 and Maple Street is estimated to operate at between LOS C and D during the weekday PM peak hour in 2015. Also, the increase in peak hour traffic volumes along Highway 30 would make access difficult to and from unsignalized side streets along the highway. The forecast 2015 weekday PM peak hour levels of service at critical intersections in the Scappoose urban area are illustrated in Table 10.

TABLE 10
FORECAST 2015 WEEKDAY PM PEAK HOUR LEVELS OF SERVICE
- NO BUILD ALTERNATIVE

Intersection		Level of Service
Highway 30 and Havlik Drive		0.93 E
Highway 30 and Old Portland Road (north end) -		
	NB Left	D
	EB Left	F
	EB Right	D
Highway 30 and High School Way/Walnut Road		0.96 E
Highway 30 and E.M. Watts Road		0.90 D-E
Highway 30 and Maple Street		0.77 C-D
Highway 30 and Columbia Avenue		0.72 C

The increased congestion and delay in the "No Build" scenario would have both environmental and socioeconomic impacts. Air quality and noise levels would worsen along the Highway 30 corridor due to the increase in congestion. The environmental impacts and long delays would also affect the livability of Scappoose, which might discourage new residents and businesses from locating in the area.

BUILD ALTERNATIVE

A set of improvements to the transportation system in the Scappoose urban area were developed and analyzed as part of the transportation system analysis. These potential improvements were developed with the help of the TAC,

referring to the goals and objectives, and they were developed to address specific deficiencies or access concerns. The 2015 travel patterns were analyzed, and based on that analysis, a list of improvements is recommended.

Highway 30, the railroad on the east side of Highway 30, and Scappoose Creek on the west side of Highway 30 currently form a barrier to east-west vehicular travel in Scappoose. Access to Highway 30 from the west side is provided at several intersecting street locations; however, access from the east side is restricted to a few streets that cross the railroad.

The street system in Scappoose is also characterized by the absence of continuous north-south routes that could provide an alternative to travel on Highway 30. As Scappoose develops, the lack of continuous east-west routes across the highway and lack of continuous north-south routes parallel to the highway is estimated to increase congestion on the highway as it necessitates highway travel for most local trips.

A combination of local street improvements is proposed to serve local access and traffic circulation, enabling motorized vehicles as well as pedestrians and bicyclists to travel locally without using Highway 30. The proposal includes a local north-south collector street system parallel to and serving as an alternative to travel on Highway 30. The proposal also includes an improved east-west collector and arterial street system that would provide access across Highway 30 and Scappoose Creek. This would reduce traffic volumes and enhance mobility of through traffic on Highway 30, while at the same time improving the accessibility and safety for local traffic.

The improvements proposed for the Build Alternative are described in the next section detailing the proposed Transportation System Plan. A revised functional classification plan is illustrated in Figure 10. Forecast traffic volumes during the weekday PM peak hour are illustrated in Figure 11.

With a local north-south collector street system parallel to and serving as an alternative to travel on Highway 30, and an improved east-west collector street system that would provide access across Highway 30 and Scappoose Creek, it is estimated that traffic volumes would be reduced along Highway 30 through the Scappoose urban area by approximately 650 vehicles during the weekday PM peak hour in 2015.

As illustrated in Figure 11, vehicular traffic volumes along Highway 30, between Havlik Drive and High School Way, are estimated to reduce volumes from 4,170 vehicles during the weekday PM peak hour in 2015, for the No Build Alternative to 3,530 vehicles for the Build Alternative. In the central part of town, between Maple Street and Columbia Street, vehicular traffic volumes are estimated to reduce volumes from 3,145 vehicles during the weekday PM peak hour in 2015, for the No Build Alternative to 2,500 vehicles for the Build Alternative.

With the reduction in traffic volumes along Highway 30, it is estimated that traffic operations will be improved at existing signalized intersections along the highway during the weekday PM peak hour in 2015. The existing signalized intersections of Highway 30 with E.M. Watts Road, Maple Street, Columbia Avenue, and Forest Road, and the proposed signalized intersection with Williams Street are estimated to operate at LOS C or better, indicating little or no congestion.

The intersection of Highway 30 with High School Way/Walnut Road is estimated to operate at LOS D, and the intersection with Havlik Drive is estimated to operate at between LOS D and E during the weekday PM peak hour in 2015. The forecast 2015, weekday PM peak hour levels of service at critical intersections in the Scappoose urban area are illustrated in Table 11 for the Build Alternative.

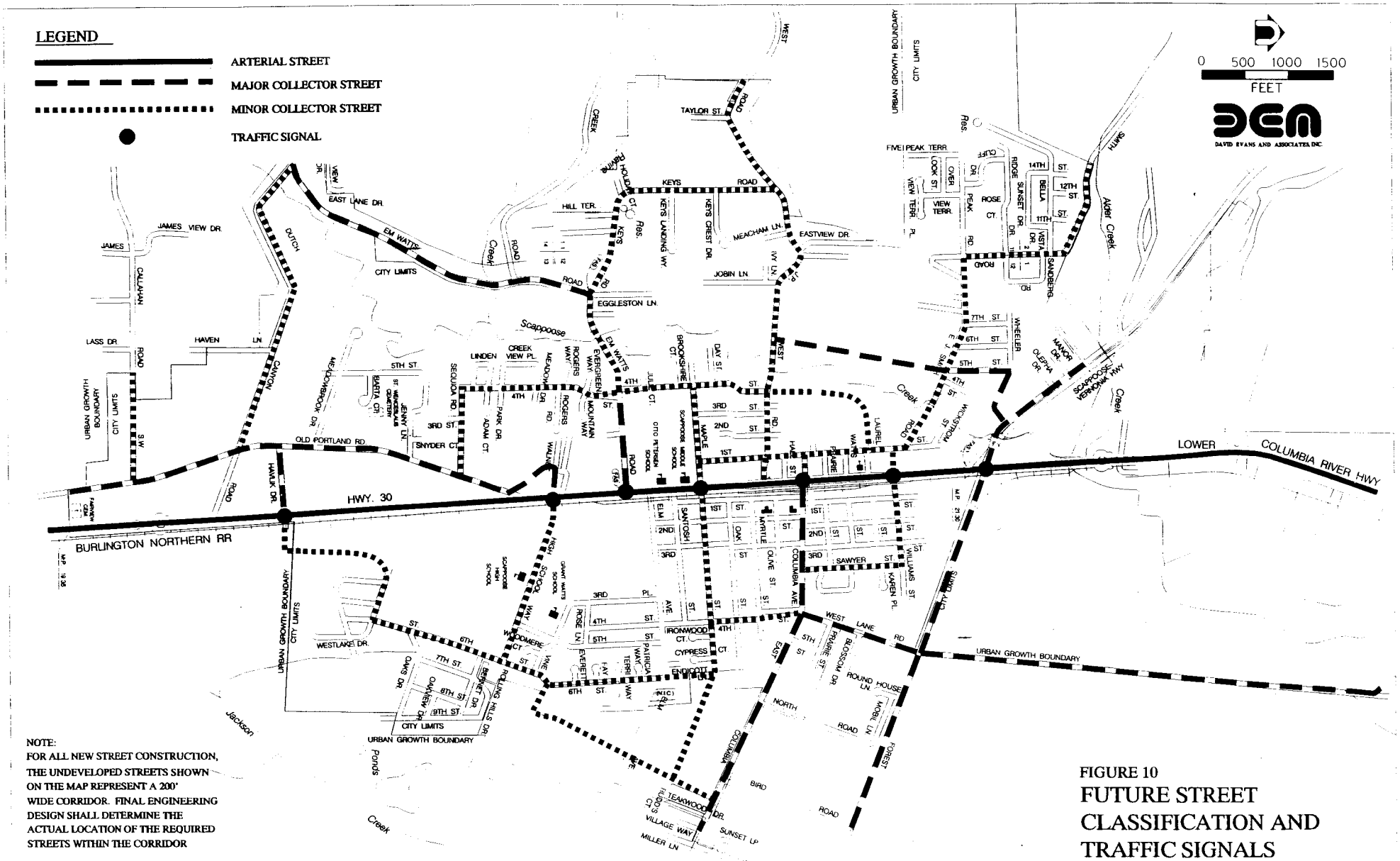

FIGURE 10
FUTURE STREET CLASSIFICATION AND TRAFFIC SIGNALS

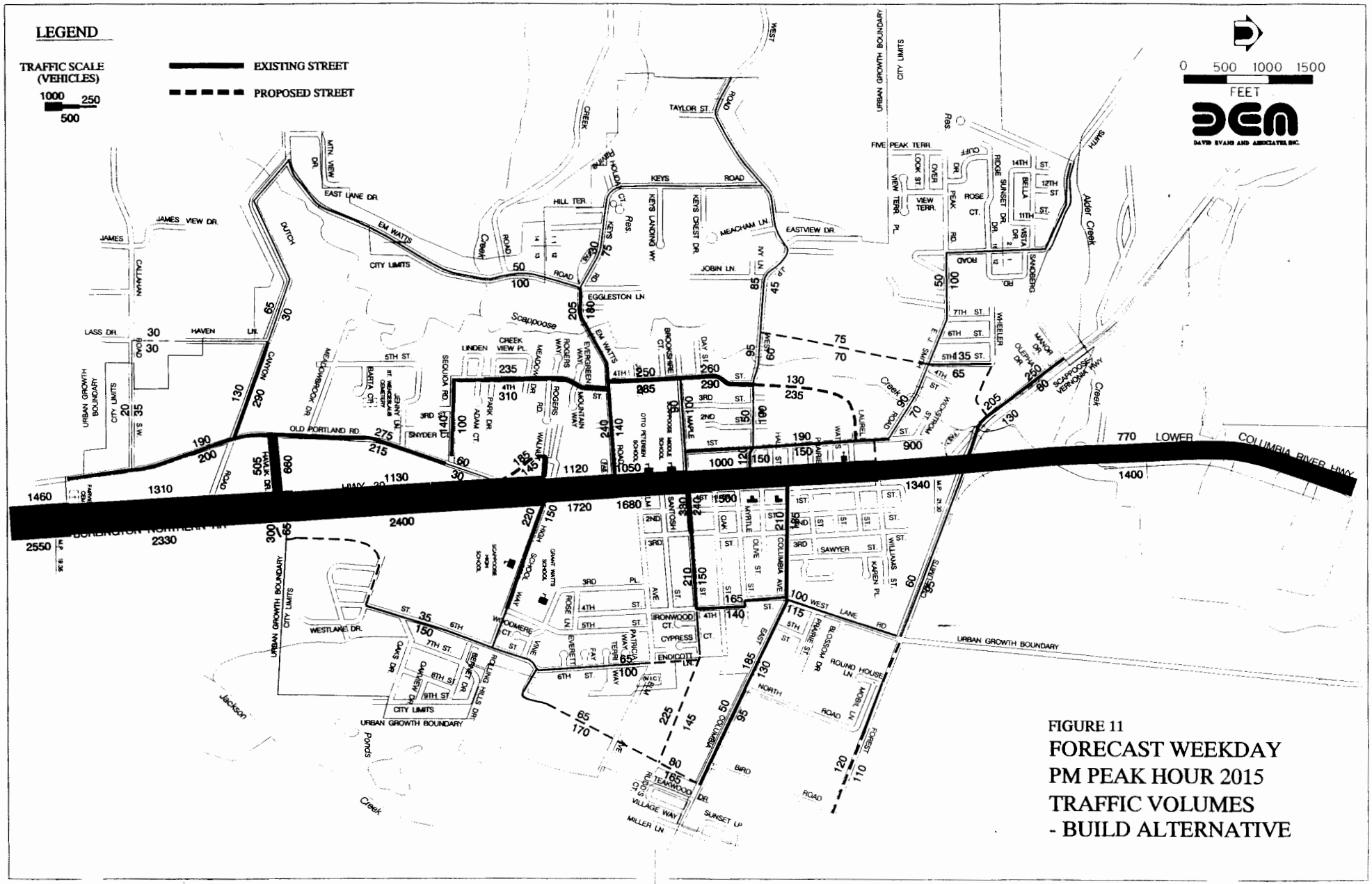

FIGURE 11

FORECAST WEEKDAY PM PEAK HOUR 2015 TRAFFIC VOLUMES - BUILD ALTERNATIVE

TABLE 11
FORECAST 2015 WEEKDAY PM PEAK HOUR LEVELS OF SERVICE
BUILD ALTERNATIVE

Intersection	Level of Service
Highway 30 and Havlik Drive	0.89 D-E
Highway 30 and High School Way/Walnut Road	0.85 D
Highway 30 and E.M. Watts Road	0.72 C
Highway 30 and Maple Street	0.70 C
Highway 30 and Columbia Avenue	0.60 B
Highway 30 and Williams Street	0.63 B
Highway 30 and Scappoose-Vernonia Highway	0.64 B

The Transportation System Plan includes plans for all modes of transportation. Components of the street system plan include street classification and street width standards, access management standards, and street improvements. Suggested transportation demand measures are also included. Lastly, a plan implementation program is presented.

STREET DESIGN STANDARDS

Street design standards relate the design of a roadway to the function performed by that roadway. The function of the roadway is determined by the characteristics of the traffic it is serving (for example local versus through traffic) and the level of direct access provided to properties located along the roadway. At one end of the spectrum, streets classified as major arterials primarily serve traffic traveling through the urban area; at the other end, residential cul-de-sac streets serve only traffic accessing properties having frontage on the street. In between the two ends of the spectrum, streets such as collectors serve a combination of through traffic as well as direct access to land.

Whatever the function, all streets should be designed so that they:

- promote the safety and convenience of vehicular and non-vehicular traffic;
- protect the safety of neighborhood residents;
- protect the residential character of neighborhoods by limiting traffic volume, speed, noise and fumes; and:
- encourage the efficient use of land.

The following describes the proposed street cross section design standards for the City of Scappoose street system.

Arterial Streets

Arterial streets carry large traffic volumes within and through urban areas, most of it being traffic traveling through the urban area. The primary emphasis is on mobility, with limited or restricted service to adjacent land development. In cases where restriction of access is not practical, such as due to build-out of the surrounding land, the design should be modified to separate the turning traffic accessing the surrounding land from the through traffic on the street. Under the revised street classification, Highway 30 is the only arterial street within the Scappoose urban growth boundary (UGB).

A 74-foot wide pavement is recommended (see Figure 12). This would accommodate four 12-foot travel lanes (two in each direction), a median 14-foot two-way left-turn only turning lane, and two six-foot shoulder bikeways. The 74-foot pavement cross section would be accommodated within a 100-foot right-of-way (ROW) cross section including curb, gutter, a six-foot planting strip, and a six-foot sidewalk on each side of the highway.

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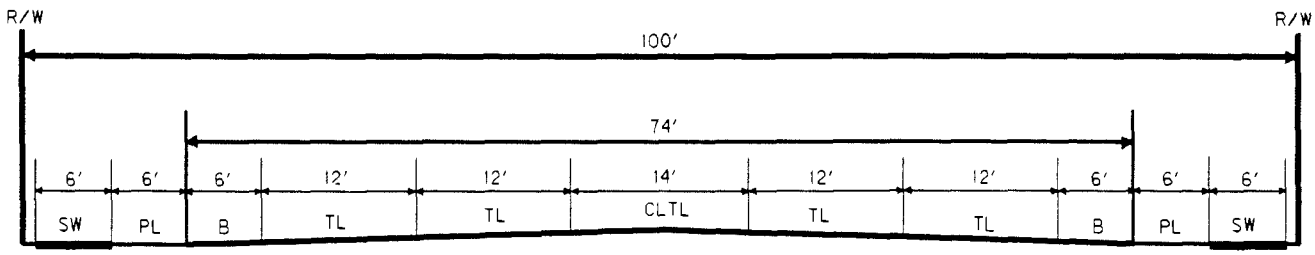
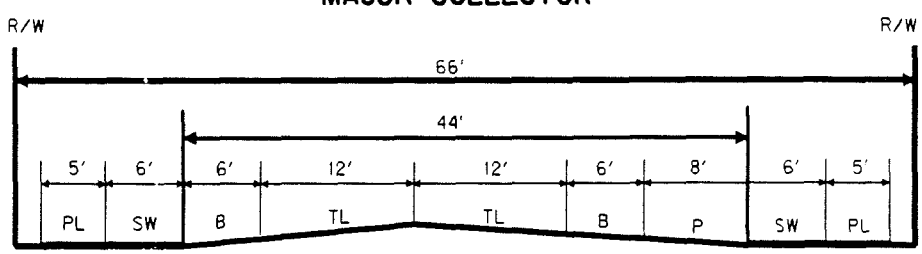
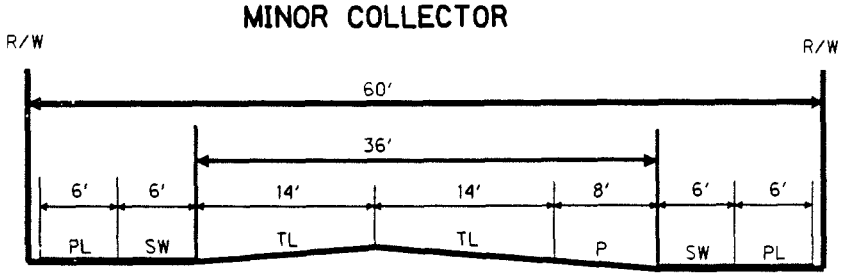
ARTERIALS



MAJOR COLLECTOR



MINOR COLLECTOR



LEGEND

TL = TRAVEL LANE
CLTL = CENTER LEFT TURN LANE
B = BIKE LANE
P = PARKING
PL = PLANTING STRIP OR BOUNDARY TREE LAWN
SW = SIDEWALK
R/W = RIGHT OF WAY LINE

FIGURE 12
STREET DESIGN STANDARDS
-ARTERIAL AND COLLECTOR
STREETS

Collector Streets

Collector streets provide the vital link between arterial and local streets. Whereas arterial streets facilitate through traffic and local streets provide direct land use access, collector streets provide both of the above functions. They connect to the arterial street system and at the same time penetrate the local neighborhoods to distribute the traffic from the arterial streets to its ultimate destination.

Major Collector Streets

Major collector streets also carry heavy traffic volumes, most of it being traffic traveling within the urban area. Major collector streets in the Scappoose urban area include: Old Portland Road, Scappoose-Vernonia Highway, West Lane Road, E.M. Watts Road, Fifth Street West, Dutch Canyon Road, East Columbia Avenue, Forest Road, and Wheeler Street between 5th Street and Scappoose-Vernonia Highway.

A 44-foot wide pavement is recommended (see Figure 12). This would accommodate two 12-foot travel lanes (one in each direction), two six-foot bike lanes (one in each direction), and an eight-foot parking lane in one direction. The 44-foot pavement cross section would be accommodated within a 66-foot ROW cross section including curb, gutter, a six-foot sidewalk, and a five-foot boundary tree lawn on each side of the pavement.

Minor Collector Streets

Minor collector streets in the Scappoose urban area include: J.P. West Road, Maple Street, Keys Road, First Street West, E.J. Smith Road, High School Way, Fourth Street East and West, Sixth Street East, Sawyer Street, and Williams Street.

A 36-foot-wide pavement is recommended for minor collector streets (see Figure 12). This would accommodate two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot-wide parking lane.

The 36-foot pavement cross section would be accommodated within a 60-foot ROW cross section including curb, gutter, a six-foot sidewalk, and a six-foot boundary tree lawn on each side of the pavement.

Local Residential Streets

The overriding consideration in the design of a local residential street is to provide direct access to land and to foster a safe and pleasant environment; the convenience of the through motorist is a secondary consideration. Typically, local residential streets carry less than 1,200 vehicles per day (vpd). Thereby, traffic volume is not a consideration in designing local residential streets.

A 36-foot wide pavement is recommended in residential neighborhoods (see Figure 13). This would accommodate two 11-foot travel lanes (one in each direction) and two seven-foot parking lanes (one on each side). The 36-foot pavement cross section would be accommodated within a 54-foot ROW cross section including curb, gutter, a six-foot wide sidewalk, and a four-foot boundary tree lawn on each side of the pavement.

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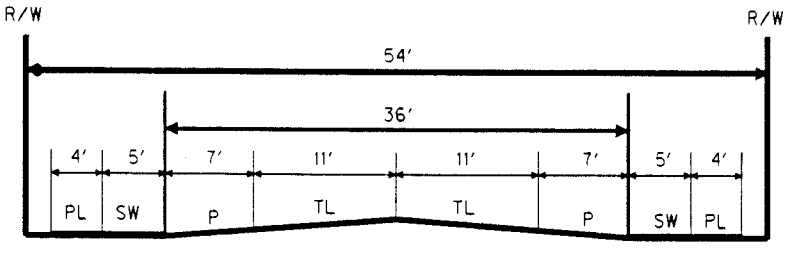
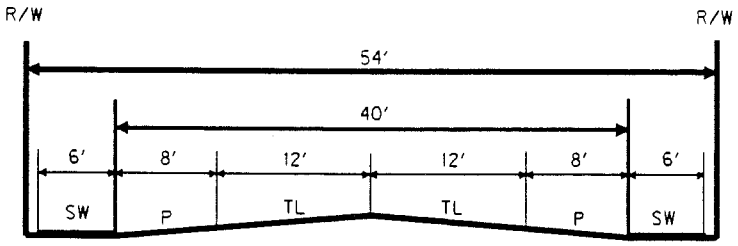
RESIDENTIAL NEIGHBORHOODS



COMMERCIAL AND INDUSTRIAL AREAS



LEGEND

TL = TRAVEL LANE
P = PARKING
SW = SIDEWALK
R/W = RIGHT OF WAY LINE
PL = PLANTING STRIP

FIGURE 13
STREET DESIGN STANDARDS -LOCAL STREETS

Cul-de-sac Streets

Cul-de-sac streets are intended to serve only the adjacent land. The use of cul-de-sac streets shall be discouraged in designing new residential subdivisions because they lead to inefficient local street circulation. The use of cul-de-sac streets is also discouraged by current policies, specifically the Oregon Transportation Planning Rule.

Cul-de-sac streets shall only be permitted in cases where development of a through street is not physically possible; for example, when topographic constraints prevent the development of a through street or in cases where existing development in the area precludes the development of a through street. When it becomes necessary to provide a cul-de-sac street in a new development, pedestrian and bicycle facilities shall be provided to connect the cul-de-sac street with the existing through street network in the area.

Because the cul-de-sac streets are open at only one end, they should be designed with a special turning area at the closed end. Typically, this would be a 'bulb' design. This is most applicable where blocks are very short and the number of dwelling units to be served is very small.

A 400-foot length is recommended as a maximum for cul-de-sacs. The turning area for residential cul-de-sac streets should be designed with a 30-foot minimum curb radius. This would allow passenger cars to make the customary U-turn and single-unit type trucks could turn by backing once. With curb, gutter, and six-foot sidewalks on each side, a minimum 42-foot right-of-way radius is recommended.

The turning area for cul-de-sac streets in commercial and industrial areas should be designed with a 45-foot minimum curb radius. This would be adequate for maneuvering by the larger trucks that are typical in industrial areas. With curb, gutter, a five-foot planting strip, and six-foot sidewalks on each side, a minimum 67-foot right-of-way radius is recommended.

Local Streets in Commercial and Industrial Areas

A 40-foot-wide pavement is recommended for local streets in commercial areas (see Figure 13). This would accommodate two 12-foot travel lanes (one in each direction) and two eight-foot parking lanes (one on each side). The 40-foot pavement cross section would be accommodated within a 54-foot ROW cross section including curb, gutter, and a six-foot sidewalk on each side of the pavement.

Boundary tree lawns are not included in the recommended street sections for local commercial and industrial streets because the Scappoose Municipal Code requires a 10-foot landscaped front yard for commercial and expanded commercial development and a 35-foot front yard for industrial development.

Separated Bicycle and Pedestrian Pathways

Bicycle and pedestrian facility improvements within the street right-of-way were included to be part of a majority of street projects programmed for construction during the 20-year planning horizon (see Table 14). A higher level of service for bicyclists and pedestrians may be provided by separating them from vehicular traffic and providing an independent trail constructed on a separate right-of-way for exclusive use by bicyclists and pedestrians. Such facilities have minimal cross flow by motor vehicles. They should be thought of as extensions of the highway system that are intended for the exclusive or preferential use of bicycles and pedestrians in much the same way as

freeways are intended for the exclusive or preferential use of motor vehicles. Sometimes they provide a commuting bicyclist or pedestrian with a short-cut (for example, a connection between cul-de-sac streets through a residential neighborhood). At other times, they provide an enjoyable recreational opportunity.

A minimum paved width of 12 feet is recommended, with an additional three feet of area adjacent to the pavement graded to provide clearance from trees, poles, walls, fences, guardrails, and other lateral obstructions. The 12-foot-wide pathway would provide for two-directional bicycle traffic along with its shared use by joggers and other pedestrians.

ACCESS MANAGEMENT

Access management is the process that provides (or manages) access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety and capacity.

Access management is an important key to balanced urban growth. As evidence, the lack of a prudent access management plan has led to miles of strip commercial development along the arterial streets of many urban areas. Business activities along arterial streets lead to increased traffic demands and the provision of roadway improvements to accommodate the increasing traffic demand. Roadway improvements stimulate more business activity and traffic demands. This often continues in a cyclical fashion, and requires extensive capital investments for roadway improvements and relocation. However, with the tightening of budgets by federal, state, and local governments, the financial resources to pay for such solutions are becoming increasingly scarce.

Reducing capital expenditures is not the only argument for access management. Access management is also essential to preserving the 'functional integrity' of the street system by reserving the high speed and high capacity roads for longer distance trips, and assigning the lowest restriction of access to local roads. Additional driveways along arterial streets lead to an increased number of potential conflict points between vehicles entering and exiting the driveway, and through vehicles on the arterial streets. This not only leads to increased vehicle delay and a deterioration in the level of service on the arterial, but also leads to a reduction in safety. Thus, it is essential that all levels of government try to maintain the efficiency of existing arterial streets through better access management.

Access Management Techniques

The primary goal of an access management program is enhanced mobility and improved safety by limiting the number of traffic conflicts. A traffic conflict point occurs where the paths of two traffic movements intersect. In the order of increasing severity, vehicle maneuvers on the street system that result in potential conflicts include diverge, merge, and cross. In each case, drivers of one or more vehicles may need to take appropriate action in order to avoid a collision.

Crossing conflicts are the most serious because of the potential for high speed head-on collisions, nearly head-on collisions, or right-angle collisions. Hence, these conflict points are often referred to as 'major conflict points.' Diverge and merge conflicts are potentially less severe and are often referred to as 'minor conflict points.' Diverge conflicts occur when a driver executes a left-turn or right-turn maneuver, and merge conflicts occur where a vehicle makes a left or right-turn and enters a through traffic stream.

The area and complexity of the crossing conflicts are also affected by the roadway cross section. For example, on a two-lane roadway, each of the conflict points with the traffic stream approaching from the left and the right involves only one lane. With a four-lane cross section, each conflict point involves two lanes.

Traffic conflicts can be reduced either by restricting the number of access points along the arterial or by separating the conflict areas through traffic operations improvements.

The number of access points to an arterial can be restricted through the following techniques:

1. Restricting spacing between access points based on the type of development and the speed along the arterial.
2. Sharing of access points between adjacent properties.
3. Providing access via collector or local streets where possible.
4. Constructing frontage roads to separate local traffic from through traffic.
5. Providing service drives to prevent spill-over of vehicle queues onto the adjoining roadways.

Traffic and facility improvements for access management include:

1. Providing acceleration, deceleration, and right turn only lanes.
2. Offsetting driveways to produce T-intersections to minimize the number of conflict points between traffic using the driveways and through traffic.
3. Installing median barriers to control conflicts associated with left turn movements.
4. Installing side barriers to the property along the arterial to restrict access width to a minimum.

General Access Management Guidelines

Access management is hierarchical, ranging from complete access control on freeways to increasing the use of streets for access purposes, parking and loading at the local and minor collector level. Table 12 describes recommended general access management guidelines by roadway functional classification and appropriate adjacent land use type.

These access management restrictions are not intended to eliminate existing intersections or driveways. Rather, they are best implemented by instituting them into the land use permitting process and applying them as new development or re-development occurs.

To summarize, access management strategies consist of managing the number of access points and/or providing traffic and facility improvements. The solution is a balanced, comprehensive program which provides reasonable access while maintaining the safety and efficiency of traffic movement.

TABLE 12
GENERAL ACCESS MANAGEMENT GUIDELINES

Functional Classification	Minimum Posted Speed	Minimum Spacing between Driveways and/or Streets [6]	Minimum Spacing between Intersections	Appropriate Adjacent Land Use Type
Major Arterial Street	25-50 mph	500 feet	1/2-1 mile	• community/neighborhood commercial near major intersections. • industrial/office/low retail
Major Collector Street	25-50 mph	300 feet	600 feet	• light industry/offices and buffered medium or low density residential • commercial near some major intersections
Minor Collector Street	25-35 mph	50 feet	300 feet	• primarily medium-low density residential
Local Residential Street	25 mph	access to each lot permitted	300 feet	• primary residential

Access Management Along Highway 30

Highway 30 is the most heavily traveled route in Scappoose. Thereby, access management is important to promoting safe and efficient travel for both local and through traffic. The following identifies specific access management strategies for Highway 30 through Scappoose.

Regulate Minimum Spacing of Driveways

The regulation of minimum spacing of driveways and public street intersections along the highway reduces the frequency of conflict by separating adjacent, basic conflict areas and limiting the number of basic conflict points per length of highway. An additional effect is that driveway vehicles will be delayed less by standing queues at signal-controlled intersections.

For the 35 mph roadway section south of Scappoose-Vernonia Highway, a 150 foot minimum spacing is recommended for (all) right-in/right-out access points and for full-access points from single-unit residential developments. For commercial and multiple-unit residential developments located along the 35 mph roadway section, a 300 foot minimum spacing is desirable. Based on a traffic study, a 150 foot minimum spacing may be allowed by going through a variance process. The spacing of adjacent driveways along the highway at distances equal to or greater than the minimum spacing recommended above may be achieved by encouraging adjacent property owners to construct joint-use driveways in lieu of separate driveways.

[6] Desirable design spacing (existing spacing will vary)

A minimum spacing of 300 feet is recommended for all public streets and driveways intersecting the highway along the 55 mph highway segment north of Scappoose-Vernonia Highway.

For major intersections with traffic signals, the minimum spacing from the signalized intersection may need to be determined by a traffic study to insure that the driveway and intersection traffic operations don't conflict due to the backup of traffic from the traffic signal.

The *1991 Oregon Highway Plan* recommends a higher access spacing standard for Access Oregon Highways (AOH), including US Highway 30, than what is recommended as part of this Access Management Plan.

Per the *1991 Oregon Highway Plan,* Highway 30 is identified as a roadway facility of statewide significance. Between High School Way and Laurel Street, it is identified as a Category 4 Access Oregon Highway (AOH). Category 4 classification permits at-grade intersections or interchanges at a minimum spacing of one-quarter mile. Also, private driveways are permitted at a minimum spacing of 500 feet from each other and from intersections, with both left and right turns permitted in and out of the driveways.

South of High School Way and north of Laurel Street within the Scappoose urban area, Highway 30 is identified as a Category 3 AOH. Category 3 classification permits at-grade intersections or interchanges at a minimum spacing of one-half to one mile. Also, private driveways are permitted at a minimum spacing of 800 feet from each other and from intersections, with only right turns permitted in and out of the driveways.

Clearly, neither the spacing of at-grade intersections or driveways can be met on the section of Highway 30 through Scappoose. The surrounding land is mostly developed and public streets and driveways currently intersect the highway at an average spacing of 250 feet from the west side. The railroad parallels the highway along the east side; thereby, access is limited to only a few public street intersections from the east side of the highway.

The higher access spacing standard in the *1991 Oregon Highway Plan* corresponds to generally higher travel speeds allowed on most Access Oregon Highways. However, the project corridor is characterized by lower travel speeds, mainly due to the proximity of development primarily on one side of the highway. While the lower travel speeds and the lower access spacing standard is not in conformance with the Oregon Highway Plan for Access Oregon Highways, it is expected to lead to safer pedestrian travel along the project corridor than would be achieved under the AOH standards.

The project corridor is also characterized by a railroad on one side of the road; thereby limiting driveway access to the other side of the road. As a result, traffic conflicts between driveway turning movements are lower than a comparable highway with residential and commercial driveway access provided on both sides of the road.

Driveway Widths

A policy on maximum driveway widths is recommended to reduce conflict areas by defining the maximum width of driveway openings on the highway. The maximum width is a function of the types of vehicles using a facility as well as the nature of the development to be served. Consideration must be given to highway operating conditions, volume, geometry, sight distance, angle of intersection and alignment (vertical and horizontal).

A 20-foot standard driveway width is recommended for single-unit residential developments, with a 16-foot minimum allowable width and a 24-foot maximum allowable width. For multi-family residential, commercial,

and industrial developments, a 36-foot standard width and a 40-foot maximum width (appropriate for driveways used by heavy trucks) is recommended.

Number of Driveways per Property Frontage

Minimizing the number of driveways per length of highway reduces the number of basic conflict points, the frequency of conflicts, and the severity of conflicts. There are many different ways to minimizes the number of driveways per length of highway. The following strategies are recommended for the project corridor:

- Limit the number of driveways per property frontage to a single drive, unless the frontage exceeds 1/4 mile.
- Restrict access from neighborhood commercial development located on the corner of a public street intersection to access on the cross-street only.
- At the permit-authorization stage, encourage adjacent property owners to construct joint-use driveways in lieu of separate driveways.
- At the permit-authorization stage, consolidate existing access to commercial sites whenever separate parcels are assembled under one purpose, plan entity or usage.
- Designate the number of driveways permitted to each existing property before development, and deny additional driveways regardless of future subdivision of that property

Driveway Sight Distance

Adequate intersection sight distance must be provided at all existing and future signalized and unsignalized intersections, including driveways. Access driveways should not be permitted where the sight distance is not adequate to allow a motorist to exit a driveway safely.

Access driveways should be designed such that they provide adequate intersection sight distance, per AASHTO guidelines. The guidelines recommend minimum sight distances for a typical vehicle (e.g. passenger car, truck, etc.) to either safely cross the highway or to safely merge with the highway traffic when turning left or right from a stopped position at the access point. The sight distance requirements based on roadway vehicle travel speeds are listed in Table 13.

TABLE 13
INTERSECTION SIGHT DISTANCE REQUIREMENTS

Vehicle Speed (mph)	Distance Along Crossroads (ft)
25	250
30	300
35	350
40	400
45	450
50	500
55	550

Driveway sight distance can be increased by eliminating or altering physical and geometric barriers, such as by altering roadway alignment (horizontal and vertical curves) and by eliminating physical obstructions (shrubbery, fencing, walls, etc.).

Require Adequate Internal Design And Circulation Plan

An adequate internal design and circulation plan will be required for all site developments having direct access to the highway. This technique is recommended for application during the site plan approval and access permitting processes.

New site developments and re-development of existing sites having direct access to the highway should be designed such that they provide adequate handling of limited parking and maneuvering areas, minimize internal interference by supplying storage areas for egress movements, and distribute ingress vehicles into the main circulation patterns with minimal hesitation and confusion. The following list reflects methods by which this technique can be properly applied.

- General location of driveway entrances will be approved by permitting agencies before the major effort toward maximum capacity planning begins.
- Wherever possible, the long sides of rectangular parking areas will be parallel to the road.
- Curved, triangular and other irregularly shaped parking areas will be avoided.
- Driveway throats will be designed long enough to allow free movement on and off of the highway. For developments generating more than 500 trips per day, the depth of the driveway throat will be determined based on a site traffic impact study.

Install Visual Clues of the Driveway

Visual clues of driveways help reduce the severity of driveway conflicts. This is accomplished by increasing driver perception time and thereby limiting maximum deceleration requirements of highway vehicles.

Driveways to all new developments and existing sites being re-developed will be designed such that they are readily visible to the approaching drivers in the through traffic lanes. Visual clues will provide information as to both the location and the geometrics of the driveway to the driver. The driver will be able to locate and identify the driveway at a distance that is at least equal to the decision sight distance (the perception-reaction distance plus the distance required to maneuver to a turn at a speed of 10 mph or less).

If circumstances exist such that adequate sight distance cannot be provided by removing obstructions or relocating the driveway, advance warning will be required. Consideration must be given to the geometric layout, traffic level and roadway type. Recommended visual cues include flashing beacons, warning sights, contrasting pavements, reflectorized treatments, driveway lighting or any combination of the above. Installation of warning devices must adhere to recommendations outlined in the Manual on Uniform Traffic Control Devices (MUTCD).

STREET, BIKEWAY, AND PEDESTRIAN SYSTEM PLAN

The Street, Bikeway, and Pedestrian System Plan was developed based on current and forecast street system deficiencies, and the local goals and objectives for this study established at the beginning of the planning process.

A combination of local street improvements is proposed to serve local access traffic circulation, enabling motorized vehicles as well as pedestrians and bicyclists to travel locally without using Highway 30. The proposal includes a local north-south collector street system parallel to and serving as an alternative to travel on Highway 30. The proposal also includes an improved east-west collector street system that would provide access across Highway 30 and Scappoose Creek, thereby reducing the need for the use of Highway 30 for east-west cross-town movement. This would reduce traffic volumes and enhance mobility of through traffic on Highway 30, while at the same time improving the accessibility and safety for local access traffic.

The transportation systems project list (Table 14) identifies improvements needed on the arterial and collector street system in the project study area to serve the needs of through and local traffic, based upon adopted land use patterns. Besides new street connections, the list also includes projects that would widen existing streets to provide adequate vehicular capacity and to provide safe access via bicycle and pedestrian modes of travel.

The following information is included for each project in the list in Table 14:

- project location, including termini;
- general project description;
- project improves travel by mode;
- project justification;
- project phasing;
- financial partners;
- project distance in miles (where applicable); and
- project cost.

Each of the above items identified in the preliminary draft project list is explained in the following discussion.

Project Location

For most projects, the description of location is a street segment defined by the street name and termini. For others, the location is an intersection. Location information will be refined when further analysis and preliminary engineering is conducted prior to construction.

Project Description

Only a general description of each project is included. Project information will be refined several times between a project's inclusion in this list and its construction. A project is analyzed before it is added to a capital improvement program and again when preliminary engineering is undertaken a year or two prior to construction.

When planning is undertaken for specific projects, many variables are considered including: traffic volumes and turns, accident history, the percentage of trucks and buses, the location of intersecting streets and driveways, the available right-of-way, topographic constraints, utility conflicts, and impacts on property owners. After such

information has been analyzed, general descriptions from this plan can be refined and more specific information can be made available.

Generally, high-cost projects require more analysis and planning than low-cost projects. For example, the construction of an arterial street for a new location may require a corridor or location study, and environmental analysis, public hearings, and right-of-way negotiations and acquisition. In some cases, an affirmative vote of residents of the city or county may also be required. On the other end of the scale, installation of traffic signals, for example, may require only limited technical analysis and preparation of construction plans and specifications.

Project Improves Travel by Mode

Projects in the list are aimed at improving some or all of the following three travel modes: namely vehicle, bicycle, and pedestrian modes.

Approximately 71 percent of the street improvement projects would improve travel by vehicular mode. These include street projects that would add mainline through capacity, projects that would add median turning lanes, as well as those projects that would upgrade the street to urban or rural standards. Also, approximately 91 percent of the street improvement projects would improve travel by the bicycle mode and 82 percent would improve travel for pedestrians through the provision of bicycle lanes/ shoulder bikeways and sidewalks, respectively.

Project Justification

Seven different project justifications are shown in the roadway projects list. Multiple justifications are indicated for most projects. The following is an explanation of those project justifications:

Access improvements are specified as a justification for 41 street and highway projects. New collector and arterial streets designed to serve presently undeveloped land are labeled as access improvements. Many existing streets proposed for upgrading also qualify since a portion of the forecast traffic increase is from land which is presently undeveloped.

Economic development is indicated on 29 projects where access would be improved for land designated for commercial and industrial use. Economic development is generally regarded as the attraction and expansion of employers, thus the emphasis on commercial and industrial sites.

Safety is indicated as a justification for 57 proposed projects on the street and highway list. A majority of the proposed projects are designed to improve safety for bicyclists and pedestrians. Improvements in other instances, such as outlying collector streets, may be needed as the area grows and traffic increases, to maintain or enhance safety conditions.

Operations improvement is included as a justification for 56 of the projects in the list. Most of these projects are intersections where excessive delays occur or are anticipated. Some other projects include widening of the roadway to accommodate additional travel lanes, a raised median, or a continuous two-way left-turn only lane.

Upgrade to urban standards is included as a justification on 49 of the projects in the list. In developing the list, it was assumed that urban standards (including curbs, gutters and sidewalks) were appropriate for most collector and arterial streets within the urban growth boundary (UGB). Streets constructed to urban standards are generally thought to be more aesthetically pleasing, safer and less costly to maintain than those not constructed to urban standards. In addition, streets constructed to urban standards generally include underground storm drainage. Many existing collector within the UGB, particularly those listed as long-range needs, indicate 'upgrade to urban standards' as a project justification.

Project Phasing

Projects in the list are divided into the general categories: short, medium, and long-range according to the phase in which construction would take place. Since environmental analysis, design, engineering work and right-of-way

acquisition precede construction, these activities may be undertaken in the phase preceding that listed for construction.

The proposed phasing is not an implementation schedule since no priorities have been set within each phase. The actual timing for project implementation will be determined later via updates of three-year Transportation Improvement Program (TIP) by ODOT, and updates to the capital improvement programs for Columbia County and the City of Scappoose. The construction of any project is contingent upon the availability of revenues in the future. Thereby, inclusion of a project in a particular phase does not represent a commitment to complete the project during that phase. It is expected that some projects may be accelerated and others delayed.

The project phasing is based on a 1995 estimate of project need and justification, funding availability and rate of land development. Should any of the factors that influence phasing prove different than expected, changes in phasing may be required. For example, a more rapid than expected land development or the occurrence of a safety or operational problem may result in the need to advance a project. Availability of funds restricted to a particular type of project may also make it appropriate to advance or delay a project.

The projects in the short-, medium- and long-range phases generally have the following characteristics:

Projects identified as short-range needs are expected to be needed within five years of Plan adoption. The short-range projects are generally designed to correct existing deficiencies (e.g., maintenance, operational or safety problems) that have associated with them a lower improvement cost.

Projects identified as medium-range needs are expected to be needed five to ten years after Plan adoption. Medium-range projects generally include collector streets that need to be upgraded to urban standards where future land development is likely to occur in the first half of the planning period. In addition, medium-range projects include those projects needed to correct level of service or operational problems, but which have long lead times before construction due to high capital cost, the need to purchase right-of-way or the need to complete environmental assessments, and also those projects for which funding has not yet been identified and is unlikely to be available in the short-range.

Projects identified as long-range are expected to be needed more than ten years after plan adoption. Long-range projects generally include those projects needed to ensure that urban standards are provided on all the remaining collector streets within the urban growth boundary. In addition, long-range projects also include higher capital cost for which funding will be unlikely until the later years after plan adoption.

Financial Partners

This category indicates the agencies that would be responsible for providing funding for the project. For projects that have more than one source of agency funding, the agency that currently has jurisdiction over the roadway segment is indicated as the likely lead for the project (u). The other financial partners for the project are indicated with a (w).

Since project timing and financing are not binding, the financial partner listing does not represent a commitment by a particular agency to construct that project. For example, Columbia County has been indicated as the lead for all county road improvement projects. However, the county may expect that the City of Scappoose take the lead on roadway improvements and upgrades of county roads located inside the Scappoose UGB and/or city limits.

Project Distance

The project distance is indicated in miles. It may also be changed prior to construction if project limits are changed as a result of further study.

Project Cost

The costs shown in this project list are preliminary planning estimates calculated in 1995 dollars. The estimates include the cost of construction, engineering, and right-of-way acquisition, where appropriate. Cost estimates are based upon costs of similar street and highway projects constructed in recent years.

Cost estimates will be refined as the construction date approaches. More precise cost estimates are prepared when projects are proposed for inclusion in local agencies' capital improvement programs. Even more detailed estimates are made during preparation of design engineering and construction specifications. Among the variables which influence the cost are right-of-way acquisition, storm drainage facilities and utility relocations. The cost of these can vary greatly and may not be known until engineering work is completed.

Short-Term Improvements

Short-term improvements would be implemented in a time frame of less than five years. The required short-term improvements were identified based on field observations, traffic volume measurements, accident analysis, and an analysis of current capacity and circulation deficiencies. A description of existing problem areas requiring short-term improvements, along with a description of the improvements, is illustrated in Figure 14. Also, the recommended short-term improvements (along with other medium-term and long-term improvements) for the Scappoose urban area are summarized in Table 14. The following briefly describes each recommended short-term improvement project.

Signal Head Modifications

An analysis of accidents at intersections along Highway 30 indicates that a high proportion of the accidents are of the turning movement and angle type accidents involving conflict between vehicles traveling straight through the intersection along Highway 30 with vehicles from the cross-street crossing the highway or turning left or right (but in most cases, turning left) on to the highway.

It is recommended that the conflict be reduced by improving the visibility of the signal heads from the cross-street approaches at all five signalized intersections in the Scappoose urban area. The visibility of the signal heads can be improved through the installation of additional pole-mounted signal heads at the side of the street.

Enforce Speed Limit along Highway 30

A study of vehicle accident records along Highway 30 through the Scappoose urban area indicated that a large proportion of the accidents could have been caused by drivers traveling at excessive speeds along Highway 30. This increases the potential of conflict between vehicles traveling straight through the intersections along

TABLE 14
TRANSPORTATION SYSTEM PROJECTS

New Proj No.	Project Location	Project Description	Project Improves			Project Justification					Project Phasing	Financial Partners			Project Distance (miles)	Unit Cost (per mile)	Project Cost
			Vehicle	Bicycle	Pedestrian	Access	Economic	Safety	Operations	Upgrade		ODOT	County	Scappoose			
1	Signalized Intersections along Highway 30	Signal head modifications	■					✓			Short-range	◆			N/A	N/A	$15,000
2	Signalized Intersections along Highway 30	Coordinate signal timing	■				✓	✓	✓		Short-range	◆			N/A	N/A	$10,000
3	School Area Traffic Control Improvements	School area traffic control improvements		■	■			✓			Short-range			◆	N/A	N/A	$100,000
4	Maple Street, Highway 30 to First Street W.	Restripe existing pavement to provide bike lanes		■				✓	✓	✓	Short-range			◆	0.05	$20,000	$1,000
5	Maple Street, Highway 30 to First Street W.	Provide curb, gutter, and sidewalks on both sides			■			✓	✓	✓	Short-range			◆	0.05	$790,000	$39,500
6	Maple Street, First Street W. to Fourth Street W.	Widen to 36-foot-wide urban cross section	■	■	■			✓	✓	✓	Short-range			◆	0.16	$1,200,000	$192,000
7	E.M. Watts Road, Highway 30 to Fourth Street W.	Widen to 44-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Short-range		◆	•	0.22	$2,150,000	$473,000
8	High School Drive, Highway 30 to Sixth Street E.	Add sidewalks and restripe with bike lanes		■	■			✓	✓	✓	Short-range			◆	0.37	$140,000	$51,800
9	Columbia Avenue W., Highway 30 to First Street W.	Reconstruct and Restripe to allow two-way operation	■	■	■	✓	✓				Short-range			◆	0.05	$1,000,000	$50,000
10	Highway 30 and Scappoose-Vernonia Highway	Realign west approach and intersection improvements	■			✓	✓	✓	✓		Short-range	◆	•		N/A	N/A	$432,000
11	Highway 30 and Scappoose-Vernonia Highway	Modify existing traffic signal	■			✓		✓	✓		Short-range		•	◆	N/A	N/A	$50,000
12	Arterial and Collector Streets	Reassign stop control	■					✓	✓		Short-range		•	◆	N/A	N/A	$10,000
13	Highway 30 and Williams Street	Provide Pedestrian Island in highway median		■	■	✓	✓	✓	✓		Short-range	◆		•	N/A	N/A	$20,000
14	Old Portland Road/Walnut Street New Connection	Construct new 44-foot-wide urban cross section	■	■	■	✓	✓	✓	✓		Short-range	•		◆	0.15	$4,100,000	$615,000
15	J.P. West Road, Highway 30 to First Street W.	Widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Short-range		◆	•	0.04	$1,800,000	$72,000
16	J.P. West Road, First Street W. to Fourth Street W.	Widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Short-range		◆	•	0.14	$1,800,000	$252,000
17	Old Portland Road, UGB to Highway 30	Widen to 44-foot-wide urban cross section	■	■	■	✓	✓	✓	✓	✓	Intermediate-Range	•	◆	•	0.95	$1,450,000	$1,377,500
18	Walnut Road, Highway 30 to Old Portland Road extension	Restripe existing pavement to provide bike lanes		■	■					✓	Intermediate-Range	•		◆	0.07	$20,000	$1,400
19	Fourth Street W., Creekview Plaza to E.M. Watts Road	Restripe existing pavement to provide bike lanes		■				✓	✓	✓	Intermediate-Range	•		◆	0.26	$20,000	$5,200
20	Fourth Street W., E.M. Watts Road to Maple Street	Restripe existing pavement to provide bike lanes		■				✓	✓	✓	Intermediate-Range	•		◆	0.15	$20,000	$3,000
21	Fourth Street W., E.M. Watts Road to Maple Street	Provide curb, gutter, and sidewalks on both sides			■			✓	✓	✓	Intermediate-Range	•		◆	0.15	$790,000	$118,500
22	Fourth Street W., Maple Street to J.P. West Road	Realign and widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Intermediate-Range	•		◆	0.34	$2,300,000	$782,000
23	First Street W., Maple Street to J.P. West Road	Improve to urban village standards		■			✓	✓	✓	✓	Intermediate-Range			◆	0.14	$1,300,000	$182,000
24	First Street W., J.P. West Road to Columbia Avenue W.	Improve to urban village standards		■			✓	✓	✓	✓	Intermediate-Range			◆	0.08	$1,300,000	$104,000
25	First Street W., Columbia Avenue W. to Williams Street	Improve to urban village standards		■			✓	✓	✓	✓	Intermediate-Range			◆	0.18	$1,300,000	$234,000
26	First Street W., Williams Street to E.J. Smith Road	Improve to urban village standards		■			✓	✓	✓	✓	Intermediate-Range			◆	0.08	$1,300,000	$104,000
27	E.J. Smith Road, Wickstrom Drive to Fifth Street W.	Widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Intermediate-Range		◆	•	0.18	$1,600,000	$288,000
28	E.J. Smith Road, Fifth Street W. to UGB	Widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Intermediate-Range		◆	•	0.68	$1,600,000	$1,088,000
29	E.J. Smith Road, Scappoose Creek crossing	Widen existing bridge over the creek	■	■	■	✓		✓	✓	✓	Intermediate-Range		◆	•	N/A	N/A	$140,000
30	Maple Street E., Highway 30 to Fourth Street E.	Widen to 36-foot-wide urban cross section	■	■	■	✓	✓	✓	✓	✓	Intermediate-Range			◆	0.28	$1,200,000	$336,000
31	Maple Street E., Fourth Street E. to Dead End	Add sidewalks and re-stripe with bike lanes		■	■			✓	✓	✓	Intermediate-Range			◆	0.10	$140,000	$14,000
32	Columbia Avenue E., Highway 30 to West Lane Road	Widen to 44-foot-wide urban cross-section		■	■		✓	✓	✓	✓	Intermediate-Range		◆	•	0.28	$2,500,000	$700,000
33	Forest Road, Highway 30 to West Lane Road	Reconstruct as new 44-foot-wide urban cross section	■	■	■	✓	✓				Intermediate-Range		◆	•	0.42	$1,400,000	$588,000
34	Fourth Street E., Maple Street to Oak Street	Widen to 36-foot-wide urban cross section		■	■			✓	✓	✓	Intermediate-Range			◆	0.05	$1,400,000	$70,000
35	Fourth Street E., Oak Street to Columbia Avenue E.	Add sidewalks and restripe with bike lanes		■	■			✓	✓	✓	Intermediate-Range			◆	0.15	$140,000	$21,000
36	Sixth Street E., Elm Avenue to Maple Street	Construct new 36-foot-wide urban cross section	■	■	■			✓	✓	✓	Intermediate-Range			◆	0.10	$3,600,000	$360,000
37	Sixth Street E., Elm Avenue to Vine Street	Widen to 36-foot-wide urban cross section	■	■	■			✓	✓	✓	Intermediate-Range			◆	0.27	$1,200,000	$324,000
38	Williams Street, Highway 30 to First Street W.	Construct new 36-foot-wide urban cross section	■	■	■	✓	✓				Intermediate-Range			◆	0.05	$3,600,000	$180,000
39	Highway 30 and Williams Street	Install new traffic signal	■	■	■	✓	✓	✓	✓		Intermediate-Range	◆		•	N/A	N/A	$125,000
40	E.M. Watts Road, Fourth Street W. to Keys Road	Widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Long-Range		◆	•	0.21	$1,800,000	$378,000
41	E.M. Watts Road, Keys Road to Dutch Canyon Road	Widen to 44-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Long-Range		◆	•	0.73	$2,300,000	$1,679,000
42	E.M. Watts Road at Scappoose Creek	Widen existing bridge over the creek	■	■	■	✓		✓	✓	✓	Long-Range		◆	•	N/A	N/A	$140,000

TABLE 14
TRANSPORTATION SYSTEM PROJECTS

New Proj No.	Project Location	Project Description	Project Improves			Project Justification					Project Phasing	Financial Partners			Project Distance (miles)	Unit Cost (per mile)	Project Cost
			Vehicle	Bicycle	Pedestrian	Access	Economic	Safety	Operations	Upgrade		ODOT	County	Scappoose			
43	Fifth Street, J.P. West Road to E.J. Smith Road	Construct new 44-foot-wide urban cross section	■	■	■	✓	✓				Long-Range	◆		◆	0.37	$4,100,000	$1,517,000
44	Fifth Street, E.J. Smith Road to Wheeler Street	Widen to 44-foot-wide urban cross section		■	■			✓	✓	✓	Long-Range	◆		◆	0.13	$1,450,000	$188,500
45	Wheeler Street, Fifth Street to Scappoose-Vernonia Highway	Construct new 44-foot-wide urban cross section	■	■	■	✓	✓				Long-Range	◆		◆	0.13	$4,100,000	$533,000
46	Keys Road, E.M. Watts Road to J.P. West Road	Widen to 36-foot-wide urban cross section		■	■			✓	✓	✓	Long-Range			◆	0.85	$1,900,000	$1,615,000
47	J.P. West Road, Fourth Street W. to Fifth Street extension	Widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Long-Range		◆	◆	0.10	$1,800,000	$180,000
48	J.P. West Road, Scappoose Creek crossing	Widen existing bridge over the creek	■	■	■	✓		✓	✓	✓	Long-Range		◆	◆	N/A	N/A	$140,000
49	J.P. West Road, Fifth Street extension to Keys Road	Widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Long-Range		◆	◆	0.36	$1,800,000	$648,000
50	J.P. West Road, Keys Road to UGB	Widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Long-Range		◆	◆	0.27	$1,800,000	$486,000
51	Dutch Canyon Road, Old Portland Road to E.M. Watts Road	Widen to 44-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Long-Range		◆	◆	0.70	$2,300,000	$1,610,000
52	Callahan Road, Old Portland Road to UGB	Widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Long-Range		◆	◆	0.23	$1,800,000	$414,000
53	Fourth Street W., J.P. West Road to First Street W.	Construct new 36-foot-wide urban cross section	■	■	■	✓	✓				Long-Range			◆	0.29	$3,600,000	$1,044,000
	Scappoose-Vernonia Highway, Highway 30 to UGB	Widen to 36-foot-wide urban cross section		■	■			✓	✓	✓	Long-Range		◆	◆	0.30	$1,200,000	$360,000
55	Columbia Avenue E., West Lane Road to Bird Road	Widen to 44-foot-wide urban cross section	■	■	■			✓	✓	✓	Long-Range		◆	◆	0.68	$1,400,000	$952,000
56	Columbia Avenue E., Bird Road to UGB	Widen to 44-foot-wide urban cross section	■	■	■			✓	✓	✓	Long-Range		◆	◆	0.93	$1,400,000	$1,302,000
57	Forest Road, West Lane Road to Bird Road	Reconstruct as new 36-foot-wide urban cross section	■	■	■	✓	✓				Long-Range		◆	◆	0.41	$1,200,000	$492,000
58	Forest Road, Bird Road to UGB	Reconstruct as new 36-foot-wide urban cross section	■	■	■	✓	✓				Long-Range		◆	◆	0.93	$1,200,000	$1,116,000
59	West Lane Road, Columbia Avenue E. to Forest Road	Widen to 44-foot-wide urban cross section	■	■	■	✓	✓	✓	✓	✓	Long-Range		◆	◆	0.26	$1,450,000	$377,000
60	West Lane Road, Forest Road to Highway 30	Widen to 44-foot-wide urban cross section	■	■	■	✓	✓	✓	✓	✓	Long-Range		◆	◆	2.72	$1,450,000	$3,944,000
61	Sixth Street E., High School Drive to North Park Drive	Widen to 36-foot-wide urban cross section	■	■	■	✓		✓	✓	✓	Long-Range			◆	0.30	$1,200,000	$360,000
62	North Park Drive, Sixth Street E. to Highway 30	Construct new 36-foot-wide urban cross section	■	■	■			✓	✓	✓	Long-Range			◆	0.40	$3,600,000	$1,440,000
63	Maple Street E., extend east to Bird Road extension	Construct new 36-foot-wide urban cross section	■	■	■			✓	✓		Long-Range			◆	0.21	$3,600,000	$756,000
64	Tenth Street E., Sixth Street to E. Columbia Avenue	Construct new 44-foot-wide urban cross section	■	■	■	✓	✓				Long-Range		◆	◆	0.49	$4,100,000	$2,009,000
65	Scappoose Creek, Dutch Canyon Road to Scappoose-Vernonia Highway	Construct bike path		■		✓	✓				Long-Range			◆	9.00	$120,000	$1,080,000
											Total Cost of Short-term Projects						$2,383,300
											Total Cost of Intermediate-term Project						$7,145,600
											Total Cost of Long-term Projects						$24,760,500
											TOTAL COST OF ALL PROJECTS						$34,289,400

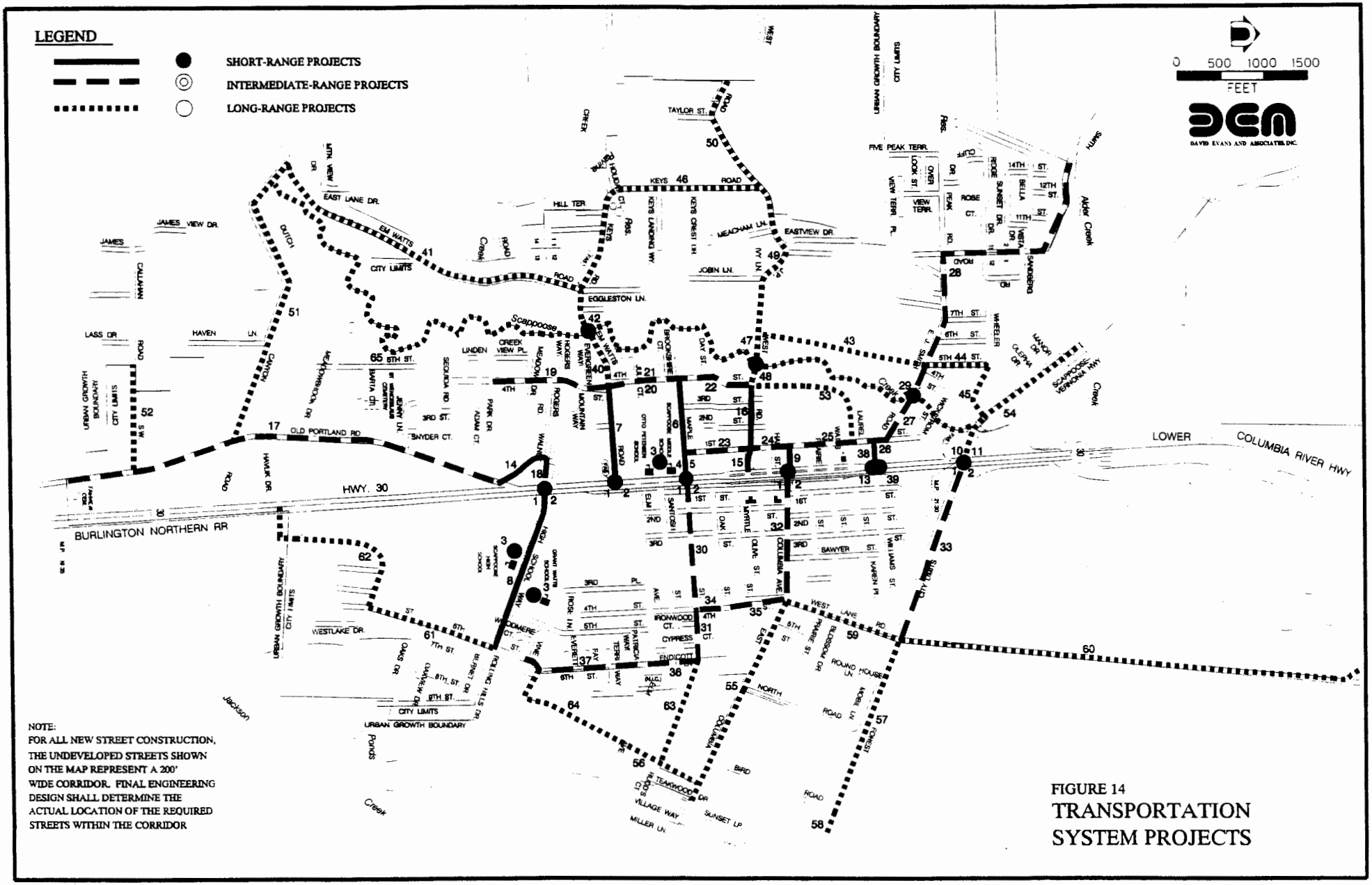


FIGURE 14
TRANSPORTATION SYSTEM PROJECTS

Highway 30 and vehicles turning left or right onto, or off of, the highway or vehicles crossing the highway. Also, rear-end conflicts between vehicles traveling in the same direction are increased.

In the short-term, it is recommended that consideration be given to more enforcement of the 35 mph speed limit along the highway. This will help reduce the conflicts between through highway and local cross-street traffic, and thereby create conditions that could lead to lower accident rates along the highway.

Signal Timing Modifications

There are currently six traffic signals along Highway 30 through the Scappoose urban area (see Figure 2). An additional signal will soon be installed at access to the Fred Meyer shopping center at the south end of the study area. The existing four signals between Columbia Avenue and High School Way are spaced within a distance of a half a mile, at an average distance of 880 feet. There are two additional traffic signals north of Columbia Avenue that do not run on the coordinated system, one signal at the Fire District access and the other at the intersection with Forest Road.

Currently, all four traffic signals along Highway 30 between Columbia Avenue and High School Way are coordinated and they work under a common system cycle length of 100 seconds. Field observations indicate the need for improvements to the signal timing offsets to provide optimum coordination for through traffic movements along the highway.

Due to the existing signal spacing along the highway, optimum coordination cannot be provided at the desired highway travel speed in both directions. Given the existing average signal spacing of 880 feet, optimum coordination in both directions can be provided in both directions only if through traffic along the highway were traveling at 15 to 20 mph. For the 35 mph travel speed along the highway, the signals would have to be placed at a half mile apart.

It is recommended that the signal timing plan be updated to provide optimum coordination in the peak traffic direction, SB in the morning and NB in afternoon, and then the best possible coordination be provided in the off-peak direction while moving through traffic along the highway at a speed of 30 to 35 mph.

School Area Roadway and Traffic Control Improvements

Three of the four schools in Scappoose are located along the city arterial and collector street system. The Scappoose High School abuts High School Way; the Scappoose Middle School abuts Maple Street and Highway 30; and the Otto Petersen School abuts E.M. Watts Road and Highway 30. The fourth school, Grant Watts School, is located in a residential neighborhood. All four schools are located in the vicinity of Highway 30.

It is recommended that traffic control in the school areas be improved in the short-term to enhance the safety of school children. The design for the school area traffic controls should be determined based on a School Area Traffic Control Study that would relate the design to the volume and speed of traffic, street width and number of children crossing. It is recommended that the city and/or school district commence that engineering study at the earliest practical time so that the improvements can be completed within the short-term five-year horizon.

In addition to the school area traffic control improvements, it is recommended that in the short-term, the following higher volume street segments, in the vicinity of the schools, be improved to urban standards, including curb, gutter, bike lanes and sidewalks on both sides of the street:

- Maple Street W., between Highway 30 and Fourth Street W. The existing street between Highway 30 and First Street W. is 37 feet wide, consisting of two travel lanes with no provision for curbs, on-street parking and bike lanes. Sidewalks are provided on both sides of the street. Maple Street is 26 feet wide between First Street W. and Fourth Street W., consisting of two travel lanes with no provision for curbs, sidewalks, on-street parking and bike lanes. The entire length of Maple Street W. is built on a 60 foot wide ROW.

  Maple Street is proposed to be classified as a minor collector street. It is recommended that the existing 37 foot wide pavement between Highway 30 and First Street W. be restriped to include two 13.5-foot wide travel lanes (one in each direction) and two five-foot bike lanes (one on each side). Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street.

  The existing street between First Street W. and Fourth Street W. would be built to minor collector street design standards. Pavement would be constructed to be 36-foot wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot-wide parking lane.

- E.M. Watts Road, Between Highway 30 and Fourth Street W.

  E.M. Watts Road is proposed to be classified as a major collector street between Highway 30 and Fourth Street W. The existing street is 20 feet wide built on a 40 foot wide ROW, and consisting of two travel lanes with no provision for on-street parking and bike lanes. Curbs are provided intermittently and a sidewalk is provided only on the south side of the street.

  The existing street between Highway 30 and Fourth Street W. would be built to major collector street design standards. Pavement would be constructed to be 44 feet wide with two 12-foot travel lanes (one in each direction), two six-foot bike lanes (one on each side), and an eight foot parking lane on one side. Also, continuous curb, gutter, planting strip, and sidewalks would be provided on both sides of the street. Additional ROW would be acquired so as widen the ROW to 66 feet to accommodate the wider street.

- High School Way, between Highway 30 and Sixth Street E. The existing segment of High School Way, between Highway 30 and Sixth Street E., would be provided with sidewalks and the pavement would be restriped to provide bike lanes.

Reconstruct and Convert Columbia Avenue West to Two-Way Operation

Currently, Columbia Avenue W., between Highway 30 and First Street W., is a one-way street 28 feet wide on a 40-foot-wide ROW. The 28-foot-wide street currently accommodates one westbound travel lane and on-street parking on both sides of the pavement.

It is proposed that Columbia Avenue W. be converted to two-way operation within the existing pavement and ROW. On-street parking would eliminated and the 28-foot-wide street would be reconstructed and striped to accommodate two 14-foot travel lanes (one in each direction).

Realign Scappoose-Vernonia Highway at its Intersection with Highway 30

Currently, the eastbound and westbound approaches at the intersection of Highway 30 and Scappoose-Vernonia Highway/Forest Road are not aligned opposite each other. The east approach is under signal control, while the west approach located less than 200 feet south of the east approach is stop-controlled. It is proposed that the west approach to the intersection be realigned, so that it intersects Highway 30 directly across from the intersection with the east Forest Road approach. The realignment of the west approach will require a modification to the left-turn lane at the northbound Highway 30 approach to the intersection.

The realignment would commence immediately east of bridge over Scappoose Creek. The new pavement would be 36 feet wide, including two 12-foot travel lanes (one in each direction) and two six-foot bike lanes (one on each side). Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street.

Reassign Control at Stop-Controlled Intersections

The revision of street classification system will require that the current traffic control plan be revised such that the higher street classification would always receive the right-of-way and lower street classification be stop-controlled, except when traffic volumes warrant four-way stop-control or traffic signals. It should be noted that this does not imply the installation of stop-control at the intersection of two local streets; such streets may still be allowed to operate uncontrolled.

New Pedestrian Crossings across Highway 30

Highway 30 constitutes a barrier to traffic circulation in the Scappoose urban area, especially for bicycle and pedestrian traffic. Pedestrians can cross the highway safely only at traffic signal controlled intersections along the highway. Between High School Way and Columbia Avenue, pedestrians can cross at traffic signal controlled intersections (including pedestrian crosswalks) that are spaced at an average distance of 880 feet apart.

Currently, the next signal north of Columbia Avenue is 2,000 feet away at Scappoose-Vernonia Highway. Based on input from the TAC, pedestrian conflicts are of particular concern in this segment due to pedestrian activity in the vicinity of the post office, located on the west side of Highway 30 and south of E.M. Watts Road. It has been observed that due to the absence of a crosswalk in the vicinity of the post office, pedestrians currently cross Highway 30 mid-block at the post office access.

In the short-term, it is recommended that pedestrian safety across Highway 30 be improved through the provision of a raised pedestrian median island 50 feet long, just south of the intersection with Williams Avenue E. and just

north of the post office[7]. Since currently William Street E. intersects Highway 30 only from the east side, the provision of a 50 foot pedestrian island on the south side of the intersection will not interfere with turning movements on and off of the highway at Williams Street or at the adjoining intersections.

Construct Old Portland Road/Walnut Street Connection to Highway 30

Old Portland Road is currently stop-controlled at its intersection with Highway 30, approximately 600 feet south of the traffic signal controlled intersection with High School Way. It is proposed that Old Portland Road be realigned such that it provides direct access to Highway 30 at the current traffic signal controlled intersection with High School Way.

The new connection would provide safe access to Highway 30 for residences and businesses located in the southeast quadrant of the city. Also, the new connection would provide safer access for school children walking or bicycling to the Grant Watts School and the Scappoose High School located on High School Way from the southwest quadrant of the city, as it would reduce the need for them to use Highway 30. Combined with the proposed extension of Park Drive, the new connection would also provide safer and direct access to the schools on High School Way from the west and northwest quadrants of the city.

The new connection would be built to major collector street design standards. Pavement would be constructed to be 44-foot wide with two 12-foot travel lanes (one in each direction), two six-foot bike lanes (one on each side), and an eight foot parking lane on one side. The pavement would be built on a 66-foot ROW that would need to be acquired along the proposed alignment. Also, continuous curb, gutter, sidewalks, and five-foot boundary tree lawn would be provided on both sides of the street.

Upgrade J.P. West Road between Highway 30 and Fourth Street W.

Currently, J.P. West Road is between 20 and 25 feet wide consisting of two travel lanes with no provision for on-street parking and bike lanes. Curbs are provided intermittently and sidewalks are not provided, and the street is built on a 40-foot-wide ROW.

It is proposed that J.P. West Road, between Highway 30 and Fourth Street W., be widened to minor collector street design standard on a 60-foot-wide ROW. The 36-foot-wide pavement would include two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use, and one eight-foot parking lane. Also, continuous curb, gutter, sidewalks, and a six-foot boundary tree lawn would be provided on both sides of the street.

Intermediate-Term Improvements

Projects identified as intermediate-term needs are expected to be needed five to ten years after plan adoption. These intermediate-term projects generally include those needed to upgrade to urban standards those collector and

[7] In the long-term, the existing signal at the existing Fire Department access would be removed and it would be replaced by a full movement traffic signal at the existing intersection with Williams Street E. Also Williams Street would be extended west of Highway 30, thereby forming a new four-legged signalized intersection.

arterial streets where the adjacent land is either currently developed or where development on adjacent land is likely to occur in the first half of the planning period.

Upgrade Old Portland Road

Old Portland Road is proposed to be classified as a major collector street. The existing street is 20 feet wide, consisting of two travel lanes with no provision for on-street parking or bike lanes. Curbs and sidewalks are provided intermittently, and the street is built on a 60-foot-wide ROW.

It is recommended that the existing street between the UGB and the proposed Old Portland Road/ Walnut Road connection be widened to 44 feet, built within the existing 60-foot-wide ROW. The 44-foot-wide pavement would include two 12-foot travel lanes (one in each direction), two six-foot bike lanes (one on each side), and an eight-foot parking lane on one side. Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street.

Upgrade Walnut Road

Walnut Road is proposed to be classified as a major collector street. The existing street is 42 feet wide, consisting of two travel lanes, curbs and on-street parking on both sides, and no bike lanes. Sidewalks are not provided on either side, and the street is built on a 60-foot-wide ROW.

It is recommended that the existing street between Highway 30 and the new Old Portland Road/Walnut Road connection be restriped to include two 12-foot-wide travel lanes (one in each direction), two five-foot bike lanes (one on each side), and an eight-foot parking lane on one side. Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street.

Upgrade Fourth Street W.

Fourth Street W. is proposed to be classified as a minor collector street. The existing street south of E.M. Watts Road is 42 feet wide consisting of two travel lanes with curbs, gutter, sidewalks, and on-street parking provided on both sides. Fourth Street W., between E.M. Watts Road and Maple Street is 44 feet wide consisting of two travel lanes with on-street parking provided on the west side of the street. Curbs and sidewalks are provided on the west side of the street between E.M. Watts Road and Julie Court. The existing street between Maple Street and J.P. West Road is 20 feet wide, consisting of two travel lanes with no curbs, sidewalks, bike lanes and on-street parking. Fourth Street W. south of Maple Street is built on 60-foot ROW, and the segment between Maple Street and J.P. West Road is built on 40-foot ROW.

It is recommended that the existing 42 feet wide pavement south of E.M. Watts Road be restriped to include two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and two seven-foot parking lanes (one on each side). Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street.

The existing 44 feet wide pavement between E.M. Watts Road and Maple Street should be restriped to include two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and two eight-foot parking lanes

(one on each side). Additionally, the segment would be provided with continuous curb, gutter, and sidewalks on both sides.

The existing curved section in the segment of Fourth Street W., between Maple Street and J.P. West Road, would be straightened and the street would be built to minor collector street design standards, with parking provided on only one side of the street. Pavement would be constructed to be 36 feet wide including two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot parking lane. Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street. Additional ROW would be acquired to widen the ROW to 48 feet to accommodate the wider street.

Upgrade First Street W.

First Street W., between Maple Street W. and E.J. Smith Road, is proposed to be classified as a minor collector street. The existing street is 32 feet wide, consisting of two travel lanes with on-street parking on both sides and no provision for bike lanes. Curbs and sidewalks are provided on both sides, and the street is built on a 50-foot-wide ROW.

There are six historic structures fronting on West First Street. Adjacent properties are zoned commercial and future redevelopment of existing residential uses is encouraged by the Scappoose Comprehensive Plan. Consideration should be given to seeking funding for technical expertise to minimize traffic lanes, increase sidewalk widths and on-street parking and install pedestrian friendly lighting in support of village style commercial development.

Upgrade E.J. Smith Road

E.J. Smith Road is proposed to be classified as a minor collector street. The existing street is 23 feet wide built on a 40- to 50-foot-wide ROW, and consisting of two travel lanes with no provision for curbs, sidewalks, on-street parking and bike lanes.

It is recommended that the existing street be widened to 36 feet, and additional ROW would be acquired so as widen the ROW to 48 feet to accommodate the wider street. The 36-foot-wide pavement would include two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot parking lane. Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street. Additional ROW would be acquired so as widen the ROW to 48 feet to accommodate the wider street.

Upgrade Maple Street East

Currently Maple Street E., between Highway 30 and Fourth Street E., is 22 to 24 feet wide built on a 60-foot-wide ROW, and consisting of two travel lanes with no provision for curbs, sidewalks, on-street parking and bike lanes. The segment east of Fourth Street E. is 44 feet wide built on a 60-foot-wide ROW; consisting of two travel lanes with curbs and on-street parking on both sides, but no provision for sidewalks and bike lanes.

The existing segment east of Maple Street E., between Highway 30 and Fourth Street E., is proposed to be widened to a minor collector street design standard, consisting of a two-lane cross section with curb, gutter, bike

lanes, sidewalks, and a boundary tree lawn on each side. Pavement would be constructed to be 36 feet wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot parking lane.

The existing 44-foot-wide pavement east of Fourth Street E. should be restriped to include two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and two eight-foot parking lanes (one on each side). Additionally, the segment would be provided with continuous sidewalks on both sides.

Upgrade Columbia Avenue East

Currently Columbia Avenue E. is 38 to 40 feet wide on a 40-foot-wide ROW between Highway 30 and Third Street, and it is 30 feet wide within a 40-foot-wide ROW between Third Street and West Lane Road.

It is proposed that Columbia Avenue be upgraded to an urban two-lane major collector street design between Highway 30 and West Lane Road. Pavement would be constructed to be 44-foot-wide with two 12-foot travel lanes (one in each direction) , two six-foot bike lanes (one on each side), and an eight-foot parking lane on one side. Where there are no existing constraints, additional ROW would be acquired, where possible, so as widen the ROW to 66 feet to accommodate the wider street.

Upgrade Forest Road

Currently Forest Road a dirt Road on a 60 foot ROW. It is proposed that Forest Road be constructed to major collector street design standard between Highway 30 and West Lane Road. Pavement would be constructed to be 44-foot-wide with two 12-foot travel lanes (one in each direction) , two six-foot bike lanes (one on each side), and an eight-foot parking lane on one side. Also, continuous curb, gutter, sidewalks, and boundary tree lawn would be provided on both sides of the street. The improved street would be accommodated within the existing 60-foot ROW.

Upgrade Fourth Street East

Currently Fourth Street E., between Maple Street and Oak Street, is 36 feet wide built on a 50-foot ROW, and consisting of two travel lanes with on-street parking on both sides and no provision for curbs, sidewalks, and bike lanes. Between Oak Street and Columbia Avenue E., Fourth Street E. is 44 feet wide built on a 60-foot ROW, and consisting of two travel lanes with curbs and on-street parking on both sides and no provision for sidewalks and bike lanes.

It is proposed that the segment of Fourth Street E. between Maple Street and Oak Street be widened to an urban two-lane cross section with curb, gutter, bike lanes, and sidewalks on each side. Pavement would be constructed to be 36-foot wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot parking lane. Additional ROW would be acquired so as widen the ROW to 60 feet to accommodate the wider street.

Between Oak Street and Columbia Avenue E., the 44-foot-wide pavement would be restriped to provide two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and two eight-foot parking lanes (one on each side).

lanes, sidewalks, and a boundary tree lawn on each side. Pavement would be constructed to be 36 feet wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot parking lane.

The existing 44-foot-wide pavement east of Fourth Street E. should be restriped to include two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and two eight-foot parking lanes (one on each side). Additionally, the segment would be provided with continuous sidewalks on both sides.

Upgrade Columbia Avenue East

Currently Columbia Avenue E. is 38 to 40 feet wide on a 40-foot-wide ROW between Highway 30 and Third Street, and it is 30 feet wide within a 40-foot-wide ROW between Third Street and West Lane Road.

It is proposed that Columbia Avenue be upgraded to an urban two-lane major collector street design between Highway 30 and West Lane Road. Pavement would be constructed to be 44-foot-wide with two 12-foot travel lanes (one in each direction) , two six-foot bike lanes (one on each side), and an eight-foot parking lane on one side. Where there are no existing constraints, additional ROW would be acquired, where possible, so as widen the ROW to 66 feet to accommodate the wider street.

Upgrade Forest Road

Currently Forest Road a dirt Road on a 60 foot ROW. It is proposed that Forest Road be constructed to major collector street design standard between Highway 30 and West Lane Road. Pavement would be constructed to be 44-foot-wide with two 12-foot travel lanes (one in each direction) , two six-foot bike lanes (one on each side), and an eight-foot parking lane on one side. Also, continuous curb, gutter, sidewalks, and boundary tree lawn would be provided on both sides of the street. The improved street would be accommodated within the existing 60-foot ROW.

Upgrade Fourth Street East

Currently Fourth Street E., between Maple Street and Oak Street, is 36 feet wide built on a 50-foot ROW, and consisting of two travel lanes with on-street parking on both sides and no provision for curbs, sidewalks, and bike lanes. Between Oak Street and Columbia Avenue E., Fourth Street E. is 44 feet wide built on a 60-foot ROW, and consisting of two travel lanes with curbs and on-street parking on both sides and no provision for sidewalks and bike lanes.

It is proposed that the segment of Fourth Street E. between Maple Street and Oak Street be widened to an urban two-lane cross section with curb, gutter, bike lanes, and sidewalks on each side. Pavement would be constructed to be 36-foot wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot parking lane. Additional ROW would be acquired so as widen the ROW to 60 feet to accommodate the wider street.

Between Oak Street and Columbia Avenue E., the 44-foot-wide pavement would be restriped to provide two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and two eight-foot parking lanes (one on each side).

Upgrade and Extend Sixth Street East

Currently Sixth Street E. is between 24 and 30 feet wide built on a 40- to 60-foot ROW between Elm Avenue and Vine Street. It consists of two travel lanes with curbs and on-street parking on the west side and no provision for sidewalks and bike lanes on either side. Between Vine Street and High School Way, Sixth Street E. is 44 feet wide built on a 60-foot ROW, and consisting curbs, on-street parking, and sidewalks on both sides, and no provision for bike lanes.

It is proposed that the segment of Sixth Street E. between Elm Avenue and Vine Street be widened to an urban two-lane cross section with curb, gutter, bike lanes, and sidewalks on each side. Pavement would be constructed to be 36 feet wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot parking lane. Additional ROW would be acquired so as widen the ROW to 56 feet to accommodate the wider street.

The existing 44-foot pavement in the segment of Sixth Street E. between Vine Street and High School Way would be restriped to provide two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and two eight-foot parking lanes (one on each side).

Sixth Street East would be extended north to intersect Maple Street. Pavement would be constructed to be 36-foot-wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use. Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street. The new connection would be built on a 46-foot ROW.

Extend Williams Street to Intersect First Street West

Williams Street currently intersects Highway 30 from the east side. It is proposed that Williams Street be extended west of its intersection with Highway 30 and intersect with First Street W. across from the intersection with the extension of Fourth Street W. The new connection, along with improvements to and the proposed extension of Fourth Street W. would provide for north-south travel, parallel to and as an alternative to travel on Highway 30 for local traffic.

The new connection would be built to minor collector street design standards. Pavement would be constructed to be 42-foot-wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use, and two seven-foot parking lanes (one on each side). Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street. The new connection would be built on a 60-foot ROW.

Signalize Intersection of Highway 30 and Williams Street

A traffic signal is recommended at the new intersection of Highway 30 and Williams Street, once the west Williams Street approach is constructed. The traffic signal would provide safe access from the minor collector street approach from the west side, serving the northwest residential area of the city and north-south local traffic on the west side of the city that use the new Fourth Street extension as a parallel route alternative to travel on Highway 30.

The new William Street traffic signal would also serve as an access for fire vehicles from the fire department located north of the proposed Williams Street W., thereby replacing the existing fire access signal on Highway 30. Besides, the signalized intersection would also provide a protected crossing across Highway 30 for bicyclists and pedestrians.

The peak hour traffic volume at the intersection from the new Williams Street approach from the west is projected at 200 vehicles during the 2015 PM peak hour, thereby meeting the MUTCD peak hour volume Warrant 11. However, the decision to install a traffic signal in the future should be based on a detailed analysis of the (future) traffic counts and analysis of all applicable MUTCD warrants.

The new signal would be located 1000 feet north of the existing traffic signal on Highway 30 at Columbia Avenue, and approximately 1100 feet south of the existing traffic signal at Scappoose-Vernonia Highway. Although the proposed signal at William Street would be located at less than the 0.5 mile standard spacing for signalized intersections proposed in the *1991 Oregon Highway Plan*, it would be in conformance with the current average spacing of traffic signals along Highway 30 through Scappoose. Currently, traffic signals along Highway 30 between High School Way and Columbia Avenue are spaced at an average distance of 900 feet apart.

Long-Range Improvements

Upgrade E.M. Watts Road

E.M. Watts Road is proposed to be classified as a major collector street west and south of its intersection with Fourth Street W. The existing street is 20 feet wide built on a 40 foot wide ROW, and consisting of two travel lanes with no provision for on-street parking, bike lanes, curbs, gutters, or sidewalks.

E.M. Watts Road between Fourth Street E. and Keys Road would be upgraded to minor collector street design standards, and it would be upgraded to major collector street design standards between Keys Road and Dutch Canyon Road. The pavement between Fourth Street E. and Keys Road would be constructed to be 42-foot-wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use, and two seven-foot parking lanes (one on each side). Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street. The new connection would be built on a 66-foot ROW.

The pavement between Keys Road and Dutch Canyon Road would be constructed to be 44-foot-wide with two 12-foot travel lanes (one in each direction), two six-foot bike lanes (one on each side), and an eight foot parking lane on one side. Also, continuous curb, gutter, boundary tree lawn, and sidewalks would be provided on both sides of the street. Additional ROW would be acquired so as widen the ROW to 66 feet to accommodate the wider street.

Westside Connection

A new connection is proposed as a major collector street on the west side of Highway 30 through Scappoose. The route would provide for continuous north-south travel on the west side of Highway 30, between Dutch Canyon Road and Scappoose-Vernonia Highway.

North of J.P. West Road, a new route would use the existing private road alignment and extend it to connect with E.J. Smith Road. The route would use the existing Wheeler Street, and then extend to connect with Scappoose-Vernonia

Highway. The new route would provide an alternative to Highway 30 for trips between residences located in the west and northwest sections of the city and commercial development along Highway 30. The new route would also serve as a safe local access connection between the residences and schools located in the west section of the city.

A new connection is proposed on the west side of Highway 30 through Scappoose. The route would provide connected north/south travel on the west side of Highway 30, between Dutch Canyon Road and Scappoose-Vernonia Highway.

Dutch Canyon connects to E.M. Watts Road. Keys Road, a minor collector, connects from E.M. Watts Road to J.P. West Road. North of J.P. West Road, a new route would connect wit E.J. Smith Road. The route would use the existing Fifth Street alignment between E.J. Smith and Wheeler Street and then extend Wheeler Street to connect to Scappoose-Vernonia Highway. The new route would provide an alternative to Highway 30 for trips between residences located in the west and northwest sections of the city and commercial development along Highway 30. The new route would also serve as a safe local access connection between residences and schools located in the west section of the city and provide secondary access and egress for properties in the northwest quadrant of the city.

Currently, Keys Road is 20 feet wide, built on a 40- to 50-foot ROW and consists of two travel lanes with no provisions for curbs, sidewalks, on-street parking, and bike lanes. The existing street would be built to minor collector street design standards. Pavement would be constructed to a 36 feet wide with two 14-foot travel lanes (one in each direction). Also, continuous curb, gutter, sidewalks, and boundary tree lawn would be provided on both sides of the street. Additional ROW would be required to widen the ROW to 60 feet to accommodate the wider street.

A new street (unnamed) would be extended north from J.P. West Road to E.J. Smith as a major collector street. Pavement would be constructed to be 44 feet wide with two 12-foot travel lanes (one in each direction) with two six-foot bike lanes (one on each side) and an eight-foot parking lane on one side. Also continuous curb, gutter, sidewalk, and boundary tree lawn would be provided on both side of the street. The new connection would be built on a 66-foot ROW.

Currently, Fifth Street is 30 feet wide, built on a 60-foot ROW, and consists of two travel lanes with no provision for curbs, sidewalks, on-street parking, and bike lanes. The existing street would be built to major collector street design standards. Pavement would be constructed to 44 feet wide with two 12-foot travel lanes (one in each direction) two six-foot bike lanes (one on each side), and an eight-foot parking lane on one side. Also continuous curb, gutter, and sidewalk would be provided on both sides of the street. The new connection would be built on a 60-foot ROW.

Wheeler Street would be extended to intersect with Scappoose-Vernonia Highway. Pavement would be constructed to 44 feet wide with two 12-foot travel lanes (one in each direction) two six-foot bike lanes (one on each side) and an eight-foot parking lane on one side. Also continuous curb, gutter, and sidewalk would be provided on both sides of the street. The new connection would be built on a 60-foot ROW.

Upgrade and Extend Maple Street west of Fourth Street West

Maple Street is proposed to be classified as a minor collector street. The existing street is 32 feet wide west of Fourth Street W., consisting of two travel lanes with on-street parking provided on both sides. Curbs and sidewalks are also not provided. The entire length of Maple Street W. is built on a 60 foot wide ROW.

The existing street west of Fourth Street W. would be built to minor collector street design standards. Pavement would be constructed to be 36 feet wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot parking lane. Also, continuous curb, gutter, sidewalks, and boundary tree lawn would be provided on both sides of the street. The improved street would be accommodated within the existing 60-foot ROW.

Upgrade J.P. West Road between Fourth Street West and UGB

Currently, J.P. West Road is between 20 and 25 feet wide consisting of two travel lanes with no provision for on-street parking and bike lanes. Curbs are provided intermittently and sidewalks are not provided, and the street is built on a 40-foot-wide ROW.

It is proposed that J.P. West Road, between Fourth Street W. and the UGB, be widened to minor collector street design standard. Pavement would be constructed to be 42-foot-wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and one eight-foot parking lane. Also, continuous curb, gutter, sidewalks, and boundary tree lawn would be provided on both sides of the street. Additional ROW would be acquired so as widen the ROW to 60 feet to accommodate the wider street.

Upgrade Dutch Canyon Road

Dutch Canyon Road, between Old Portland Road and E.M. Watts Road, is proposed to be classified as a major collector street. The existing street is 20 feet wide, consisting of two travel lanes with no provision for on-street parking and bike lanes. Curbs and sidewalks are also not provided, and the street is built on a 40-foot-wide ROW.

It is recommended that the existing street be widened to 44 feet, and additional ROW would be acquired so as widen the ROW to 66 feet to accommodate the wider street. The 44 foot wide pavement would include two 12-foot travel lanes (one in each direction), two six-foot bike lanes (one on each side), and an eight foot parking lane on one side. Also, continuous curb, gutter, planting strip, and sidewalks would be provided on both sides of the street.

Upgrade Callahan Road

Callahan Road is proposed to be classified as a minor collector street. The existing street is 19 feet wide, consisting of two travel lanes with no provision for on-street parking and bike lanes. Curbs and sidewalks are also not provided, and the street is built on a 40-foot-wide ROW.

It is recommended that the existing street be widened to 36 feet, and additional ROW would be acquired so as widen the ROW to 60 feet to accommodate the wider street. The 36-foot-wide pavement would include two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use, and one eight-foot parking lane. Also, continuous curb, gutter, sidewalks, and boundary tree lawn would be provided on both sides of the street.

Extend Fourth Street West, North to Intersect First Street West

Fourth Street W. currently extends north up to its intersection with J.P. West Road. It is proposed that Fourth Street W. be extended north of its existing alignment and then curve east and intersect with First Street W. at Laurel. The intersection with First Street W. would be located across from the proposed extension of Williams Street west of Highway 30 (see Figure 14). The new connection would provide for connected north-south travel, parallel to and as an alternative to travel on Highway 30 for local traffic.

The new connection is being built to current local street standards. Pavement is constructed 32 feet wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use and no parking. Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street. The connection is built on a 46-foot ROW.

Upgrade Scappoose-Vernonia Highway

Scappoose-Vernonia Highway is proposed to be classified as a major collector street. The existing highway is 30 feet wide built on a 60-foot-wide ROW, and consisting of two travel lanes with no provision for curbs, sidewalks, on-street parking and bike lanes.

The realignment of Scappoose-Vernonia Highway at the intersection with Highway 30 is proposed as a short-term improvement, so that the realigned approach intersects Highway 30 across from the intersection with Forest Road. The realigned highway segment would be built to a 36-foot-wide urban cross section.

It is proposed that the remaining segment of Scappoose-Vernonia Highway within the Scappoose UGB be widened in the long-term to a 36 feet urban cross section, including curb gutter, and sidewalks; but within the existing 60 foot ROW. The 36-foot-wide pavement would include two 12-foot travel lanes (one in each direction) and two six-foot bike lanes (one on each side). Also, parking would not be provided on either side of the highway. Also, continuous curb, gutter, sidewalks, and boundary tree lawns would be provided on both sides of the street.

Upgrade Columbia Avenue East

Currently Columbia Avenue E. is 20 feet wide within a 60-foot ROW east of West Lane Road. It is proposed that Columbia Avenue be upgraded to an urban two-lane major collector street design standard between West Lane Road and the UGB. Pavement would be constructed to be 44-foot-wide with two 12-foot travel lanes (one in each direction), two six-foot bike lanes (one on each side), and an eight foot parking lane on one side. Also, continuous curb, gutter, planting strip, and sidewalks would be provided on both sides of the street.

Upgrade Forest Road

Currently, Forest Road a dirt Road on a 60-foot ROW. It is proposed that Forest Road be constructed to minor collector street design standard between West Lane Road and the UGB. Pavement would be constructed to be 36 feet wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use, and one eight-foot parking lane. Also, continuous curb, gutter, sidewalks, and boundary tree lawn would be provided on both sides of the street. The improved street would be accommodated within the existing 60-foot ROW.

Upgrade West Lane Road

Currently West Lane Road is 20 feet wide on a 40-foot-wide ROW. It is proposed that West Lane Road be widened to an urban major collector street design standard, consisting of two-lane cross section with curb, gutter, bike lanes, and sidewalks on each side. Pavement would be constructed to be 44-foot-wide with two 12-foot travel lanes (one in each direction) , two six-foot bike lanes (one on each side), and an eight-foot parking lane on one side. Additional ROW would be acquired so as widen the ROW to 66 feet to accommodate the wider street.

Upgrade and Extend Sixth Street East

The existing segment of North Park Drive is proposed to be improved and extended south to intersect Highway 30. The new connection would be built to major collector street design standards. Pavement would be constructed to be 42-foot-wide with two 12-foot travel lanes (one in each direction) two six-foot bike lanes (one on each side), and an eight-foot parking lane on one side. Also, continuous curb, gutter, and sidewalks would be provided on both sides of the street. The new connection would be built on a 66-foot ROW.

Extend Maple Street East

Maple Street E. is proposed to be extended east of the existing segment to intersect with the Vine/10th Street extension. The new street would be constructed to an urban minor collector street design standard, consisting of a two-lane cross section with curb, gutter, bike lanes, and sidewalks on each side. Pavement would be constructed to be 36 feet wide with two 14-foot travel lanes (one in each direction) for shared vehicle and bicycle use, and one eight-foot parking lane. Also, continuous curb, gutter, sidewalks, and boundary tree lawn would be provided on both sides of the street. The new connection would be built on a 60-foot ROW.

Extend Sixth Street East

Southeast Sixth Street is proposed to be extended from the curve north of Vine Street to connect and turn north creating Tenth Street. The new street would be constructed to minor collector street design standard. Pavement would be constructed to be 36 feet wide with two 14-foot travel lanes (one each direction) for shared vehicle and bicycle use and one eight-foot parking lane. Also continuous curb, gutter, sidewalk, and boundary tree lawns would be provided on both sides of the street. The new connection would be built on a 60-foot ROW.

Separated Bicycle and Pedestrian Pathways

A separated bicycle and pedestrian pathway is proposed along Scappoose Creek, on the west side of Highway 30, between Dutch Canyon Road and Scappoose-Vernonia Highway. The bicycle and pedestrian pathway should be paved to be 12 feet wide, with an additional three feet of area adjacent to the pavement graded to provide clearance from trees, poles, walls, fences, guardrails, and other lateral obstructions. The 12-foot wide pathway would provide for two-directional bicycle traffic along with its shared use by joggers and other pedestrians.

BIKEWAY PLAN

Bicycles are legally classified as vehicles which may be ridden on most public roadways in Oregon. Because of this, bicycle facilities shall be designed to allow bicyclists to emulate motor vehicle drivers. Shared roadway facilities are common on city street systems. On a shared roadway facility, bicyclists share the normal vehicle lanes with motorists. Where bicycle travel is significant, bike lanes are most appropriate.

Bike lanes are currently provided in the Scappoose urban area only along Highway 30, and along E.M Watts Road between Highway 30 and West Fourth Street. Also, East Second Street and East Fourth Street are in places wide enough for safe shared use by both vehicles and bicycles.

While all streets in the Scappoose urban area should accommodate safe travel by bicyclists, a bikeway network providing a higher level of service for bicyclists should be implemented along all designated arterial and collector streets to encourage bicycle use.

Where separate bike lanes are recommended, they should be provided on each side of the road and be five or six feet wide. Bike lanes are located adjacent to the curb, except where there is curb parking or a right-turn lane. Where these conditions occur, the bike lane will be located between the through travel lane and the parking or right-turn lane. The bike lane will be marked for travel in the same direction as the adjacent travel lane. The striping shall be done in conformance with the Manual on Uniform Traffic Control Devices.

The bikeways on new streets or streets to be improved as part of the street system plan shall be added when the improvements are made. The Transportation System Project List identifies an approximate schedule for these improvements.

PEDESTRIAN FACILITIES PLAN

Walking currently accounts for a lower percentage of the journey-to-work trips (3 percent) in the Scappoose urban area than the national average (3.9 percent). Upgrade of existing facilities and an expansion of the sidewalk system is planned to help bring the mode share for journey-to-work trips above the national average, and also more importantly increase the use of walking for non-work trips. The upgrade of the pedestrian system would include the infilling of missing sidewalk links and the design of subdivision layouts such that they provide for non-roadway pedestrian links between subdivisions and neighborhood commercial areas and schools.

Many of the existing roadways in Scappoose do not have sidewalks. Sidewalks are currently provided along the west side of Highway 30 south of High School Way, and on both sides of Highway 30 north of High School Way. Also, sidewalks are provided along several streets in the Scappoose urban area. These include sections of E.M. Watts Road, West First Street, and West Fourth Street on the west side of Highway 30; and sections of Maple Street, Columbia Avenue, East Sixth Street, and Sawyer Street on the east side of Highway 30.

Sidewalks are required on both sides along all streets within the urban growth boundary to meet the requirements set forth in the street design standards. Sidewalks and walkways should be required in new developments in the municipal area and they should be provided in connection with most major street improvement projects. Also, a systematic approach to filling gaps in the sidewalk system and an annual allocation for construction is recommended. The highest priority for sidewalk construction should probably be given to locations near schools and to heavily used transit corridors. Safety should be a prime consideration in evaluation and design.

A complete pedestrian system shall be implemented in the city. Every paved street shall have sidewalks on both sides of the roadway meeting the requirements set forth in the street standards. Pedestrian access on walkways shall be provided between all buildings including shopping centers and abutting streets and adjacent neighborhoods.

Over time, sidewalks shall be added to streets which currently lack them and are not programmed for improvements. The priority streets shall be major and minor collector roadways where pedestrians feel most uncomfortable because of the higher traffic volumes these roadways carry. Streets such as High School Way, Fourth Street East, and Fifth Street East are all collector roadways which lead to schools. Adding sidewalks to these streets and others which lead to schools and parks shall be the highest priority when evaluating sidewalk projects. Residential streets shall also have sidewalks; however, because they are lower vehicular traffic volume streets, they shall be lower priority for adding sidewalks.

Consideration may be given to providing curb extensions to shorten crossing distances and to alert motorists to the presence of pedestrians. These are rounded extensions of the sidewalk located at intersections. Curb extensions allow motor vehicle turning movements while improving visibility for both the pedestrian and motorists, as well as shortening pedestrian crossing distances.

TRANSPORTATION DEMAND MANAGEMENT PLAN

Through transportation demand management (TDM), the peak travel demands could be reduced or spread to more efficiently use the transportation system, rather than building new or wider roadways. Techniques which have been successful and could be initiated to help alleviate some traffic congestion include carpooling and vanpooling, alternative work schedules, bicycle and pedestrian facilities, and programs focused on high density employment areas.

The major effect of the TDM programs would be on the home to work and return trips. The journey-to-work census data for 1990 indicated that 82 percent of the journey-to-work trips in the Scappoose area are the drive-alone type. Of the remaining 18 percent of the journey-to-work trips, 13 percent use carpools, 3 percent walked to work, 1 percent worked at home, and less than 1 percent biked to work or used other travel modes.

The census data includes only travel mode distribution for journey-to-work trips. However, peak period traffic consists of journey-to-work trips and trips for non-work related purposes. During the peak periods, automobiles are estimated to carry 97 percent of the total trips in the Scappoose urban area, with the remaining three percent by a mode other than the automobile. Of the 97 percent carried by automobiles, 93 percent is estimated to be carried by single-occupant automobiles and the remaining four percent by carpools.

Overall, automobiles (including carpools) are estimated to carry 98 percent of the daily trips in the metropolitan area, with the remaining two percent by a mode other than the automobile. Of the 98 percent carried by automobiles, 96 percent is estimated to be carried by single-occupant automobiles and the remaining two percent by carpools.

In the future, TDM strategies are estimated to decrease the automobile share of the total peak hour trips by six percent, and by three percent overall for the day. Although the overall reduction may be small, travel conditions during the peak hours would still experience a noticeable benefit. An estimated 325 vehicles will be removed from the street system during the peak hour of travel. Overall, 1,565 daily vehicular trips are estimated to be removed from the street system.

Alternative Work Schedules

Alternative work schedules (*such as flex-time or staggered work hours*), especially with large employers, can help spread the peak period traffic volumes over a longer time period, thus providing greater service out of a fixed capacity roadway. Staggered work hours should be encouraged with new industries and be coordinated to eliminate high surges of traffic.

Limited national data suggests that 22 percent of office employees eligible for a voluntary alternative work arrangement will actually adopt that arrangement (assuming that each employee is only eligible for one arrangement). Obviously, a higher rate of employee use would result from mandatory arrangements. For example, if 50 percent of the employees at a 100-person firm were eligible for an alternative work arrangement, 11 employees could be expected to adopt that arrangement. In the Scappoose area, 82 percent or nine of these employees would drive alone to work.

For Flex-Time or staggered work hours, this would mean that nine vehicle trip "legs" per day would shift out of the peak hour (4.5 for any given peak hour). For a 4/40 compressed work week (four 10-hour days), a reduction of a little less than two vehicle trips per day can be expected. Thus, a maximum of nine work trips would be eliminated (with flex-time or staggered work hours program) per 100 employees for a major employer that would be eligible for a voluntary alternative work arrangement.

Assuming that there would be four major employers (with 50 or more on-site employees) in the Scappoose area in the future that would be eligible for a voluntary alternative work arrangement, it is expected that alternative work arrangements would shift a maximum of 18 commuter trips from the peak to the off-peak hours. This amounts to approximately 0.03 percent of the approximately 55,000 total daily trips and 0.3 percent of the total peak hour trips in the Scappoose area in 2015.

Telecommuting

The effectiveness of telecommuting in reducing demand would depend on the number of employees for which telecommuting is an option, the level of participation of their employers, and the average number of telecommuting days. Employees eligible for telecommuting would come mostly from information industries such as accounting, data processing, programming, and engineering design. Production lines, construction, or sales, in contrast, would not provide many opportunity for telecommuting. Some employers require part of each employee's time each week to be spent in the office, others allow the employee flexibility to use telecommuting exclusively.

The number of eligible employees who actually telecommute would depend upon the level of participation of their employers. Finally, employees who actually telecommute may not do so for all five business days--national data suggests an average of 1.8 days per week. Using this average and the example of the 100-person information firm with 8 employees who formerly drove and now choose to telecommute, there would be a daily reduction of a little more than 3 vehicle trips.

Assuming that ten percent of future Scappoose residents would be accounted for by finance, government, and service sector employees that would be likely candidates for telecommuting, and that one half of the likely candidate employees would be working for employers that would have an established telecommuting program, it is expected that employer-based telecommuting programs would reduce total daily traffic by approximately 8

vehicle trips during the peak hour. This amounts to approximately 0.02 percent of the approximately 55,000 total daily trips and 0.2 percent of the total peak hour trips in the Scappoose area in 2015.

Ridesharing

The effectiveness of subsidizing ridesharing and increasing rideshare convenience depends not only upon the particular tool chosen, but also upon the combination of tools chosen. Consequently, general estimates of the effectiveness of these tools are difficult to obtain. Specific estimates of particular combinations of tools could be evaluated using a TDM model.

Currently, 13 percent of the journey-to-work trips in the Scappoose urban area take place by carpooling. The current carpooling rate is slightly less than the national average of 13.4 percent. Assuming that in the future the carpooling rate increases to 15 percent and that the overwhelming majority of those who switch to carpooling would come from single occupant vehicles (SOVs), ridesharing is estimated to reduce the peak hour trips by 165 vehicle trips. This amounts to approximately 0.3 percent of the approximately 55,000 total daily trips and 3 percent of the total peak hour trips in the Scappoose area in 2015.

Pedestrian/Bicycle Facilities

Currently, 3 percent of the journey-to-work trips take place by walking. Doubling that percentage to 6 percent seems overly optimistic, especially considering that in most cases only workers living close to their place of work would use the walk mode and that most of these trips may already have been captured. In the future, the mode split for walking is estimated to increase by one half to 4.5 percent of the overall trips.

The bicycle mode split is estimated to increase to 2 percent of the overall trips. Doubling the current mode share for bicycle travel seems reasonable as bicycle trips are less dependent on distance and they tend to be longer, as compared to walking trips. Thereby, the planned provision of adequate facilities for bicycles (and pedestrians) along all arterial and collector streets and many local streets in the metropolitan area is expected to significantly increase the attractiveness and competitiveness of bicycles as a travel mode.

PUBLIC TRANSPORTATION PLAN

Currently, Colco Transportation operated by the Columbia County Council of Senior Citizens provides demand-responsive bus service for elderly and disadvantaged citizens in the county for travel to Portland, St. Helens, and throughout Scappoose. There is currently no inter-city transit service to Scappoose.

Without intercity bus service, Scappoose's transportation system does not follow the guidelines of the Oregon Transportation Plan (OTP). These guidelines are set up to help regional and local agencies in their transportation planning policies and programming to provide an integrated transportation system.

Although there currently are no plans in the short-term to re-institute inter-city transit service to Scappoose along the Highway 30 corridor, we understand based on our conversations with ODOT a private party has shown interest and it is likely that inter-city transit service along Highway 30 will be re-instituted in the next one or two

years. In addition, there may be an increasing need for on-demand transportation services as the area population grows.

No costs have been estimated for this modal plan. Grants may be available to conduct feasibility studies. State and federal funding may be available to purchase equipment.

RAIL SERVICE PLAN

There is currently no passenger rail service to the Scappoose urban area. Rail freight service to the area is provided by Portland Western Railroad that operates a railroad through the area, adjacent and on the east side of Highway 30. The railroad expects to maintain freight service along the corridor in the foreseeable future.

AIR SERVICE

Air service to the study area is provided by the Scappoose Industrial Airpark located to the northeast of the city. The Airpark accommodates private planes used in business and recreation, but it is not licensed to handle passenger service or air cargo on a scheduled basis.

The Scappoose Industrial Airpark is governed by the 1991 Scappoose Industrial Airpark Master Plan and subsequent updates included as Appendix E attached hereto and incorporated herein.

WATER SERVICE

Scappoose has no waterborne services within its urban growth boundary (UGB).

PIPELINE SERVICE

There are no anticipated changes expected to be made in the future to the natural gas distribution line serving the Scappoose area. Also, there are currently no major water or oil pipelines within the city limits of Scappoose and there are no foreseeable plans to install any major water or oil pipelines in the future.

FUNDING OPTIONS AND FINANCIAL PLAN

The Goal 12 Transportation Planning Rule (*OAR 660-12-040*) requires that Transportation Systems Plans for cities with populations over 2,500 persons include a transportation financing program. Transportation financing programs must include a list of planned transportation facilities and improvement projects, and an estimate of the timing and costs of those projects. They must also include an analysis of the ability of existing and potential funding mechanisms to fund proposed transportation improvement projects. This section evaluates funding options as part of the Scappoose Transportation System Plan.

According to the *1993 Oregon Roads Finance Study*, nearly one-third of Oregon's road miles are in poor condition. Statewide, city transportation financing needs for the next 20 years total nearly $8 billion. Over 40 percent of this need is unfunded at this time. Scappoose shares some of this unfunded transportation need. Growth pressures combined with the general anti-tax sentiment of Oregon voters make the development of adequate and equitable funding mechanisms an important part of an overall transportation strategy.

The City of Scappoose will probably need to find new financing mechanisms to address transportation systems maintenance and improvements over the next 20 years. This section provides an analysis of transportation funding options for the City of Scappoose. This section describes existing transportation financing mechanisms used by the city, identifies and evaluates potential funding alternatives and programs, and describes funding guidelines associated with selected programs.

The analysis of funding options begins with a review of the transportation budgets for Columbia County and Scappoose, and is followed by a description of the existing status of transportation funding in Scappoose. Existing studies were reviewed and phone interviews were conducted with people knowledgeable about transportation finance to identify existing and potential funding programs. Existing and potential funding mechanisms against standard criteria: (1) legal authority; (2) financial capacity; (3) administrative cost; (4) equity; (5) political acceptability; and (6) stability.

EXISTING TRANSPORTATION FUNDING SOURCES

Transportation Funding in Oregon

Transportation improvements in Oregon are funded through a variety of federal, state, county, and city sources. Table 15 shows sources of road-related revenues in Oregon by jurisdictional level. Statewide, the State Highway Fund composes almost half of road-related revenues. The State Highway Fund is funded by state-imposed transportation user fees, including motor vehicle fuel taxes, weight-mile taxes on trucks, and vehicle registration fees.

TABLE 15
FY91 ROAD-RELATED REVENUES BY JURISDICTIONAL LEVEL

Funding Source	State	County	City	Statewide
State Highway Fund	58%	38%	41%	48%
Federal	34%	40%	4%	30%
Local	0%	22%	55%	17%
Other	9%	0%	0%	4%
Total	100%	100%	100%	100%

Source: Oregon Department of Transportation (1993), *Oregon Roads Finance Study.*

Approximately 24 percent of the Highway Trust Fund is shared with counties and 16 percent is shared with cities; the remaining 60 percent goes to state highway programs. These shared funds are distributed to counties based on their share of vehicle registrations, and to cities based on their share of population, except that $500,000 is reserved to share with counties to improve county equity, and $500,000 is reserved to share with cities as part of the Special City Allotment program.[8] The Oregon Constitution (Article IX, Section 3a) dedicates revenue from motor vehicle fuel taxes, weight-mile taxes on trucks, and vehicle registration fees to the construction, maintenance, and operation of public roads.

Federal funds contribute about 30 percent of road-related revenue statewide. Federal transportation revenues come from a variety of taxes on gasoline, diesel, other fuels, tires, truck sales, and interstate truck weight. These funds are allocated to programs established by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), including the Surface Transportation, Interstate, National Highway System, Bridge Replacement and Rehabilitation, and Enhancement programs. Each of these programs has specific criteria for funding projects; the criteria for these programs are summarized in the Appendix as Table D-1. Based on 1995 estimates, ISTEA programs will contribute about $156 million to state highway programs, $7 million to counties, $10 million to large cities, and $5 million to small cities in Oregon for FY95.[9]

In addition to ISTEA funds, some counties in Oregon receive federal revenue from their share of receipts for timber sales on US Forest Service and Bureau of Land Management lands. These payments are included in the federal revenues reported in Table 15. Federal timber receipt payments are discussed in more detail below under the heading Transportation Funding in Columbia County.

Table 15 shows that state and federal funds together account for almost 80 percent of road-related revenue for counties in Oregon, with the balance from local sources. For Oregon cities, the State Highway Fund contributes 41 pecent of total road-related revenue. Only a small amount of road-related revenue in Oregon cities comes directly from federal sources, about 4 percent. Federal and state funds are allocated by ODOT for transportation

[8] Oregon Department of Transportation. 1995. *Financial Assumptions for the Development of Metropolitan Transportation Plans.*

[9] Ibid. Portland is the only "large city" in Oregon as defined by ISTEA.

projects throughout the state through the Statewide Transportation Improvement Program (STIP). There are no roadway projects in the current STIP that will occur in the Scappoose area.

Outlook for Federal and State Revenue in Oregon

In spring 1994, ODOT formed a committee to estimate future state and federal transportation funding levels through 2015, based on assumptions about underlying factors such as the political climate, economic structure and conditions, population and demographics, and patterns of land use. It should be emphasized that the results of this process are *estimates* which could change (and, in fact, already have changed) with changes in economic conditions, state and federal legislation, land use patterns, and many other variables.

ODOT's estimates of federal and state revenue rest on two primary assumptions:

- For State Highway Fund revenue, the forecast committee assumed the fuel tax (and corresponding weight-mile fee) will increase 1¢ per gallon per year, with an additional 1¢ per gallon added every fourth year, or equivalent increases in vehicle registration fees or other revenue sources. The forecast committee also assumed that Transportation Planning Rule goals are met (for example, that per capita vehicle-miles traveled annually will actually decrease 10 percent by 2015).

- For federal revenue, the forecast committee assumed that it would grow through 2015 at the same rate as in the period from 1984–1997, when the current ISTEA expires. The forecast committee implicitly assumed that ISTEA would be reauthorized by Congress.

These assumptions impose countervailing biases on the revenue estimates; overall the estimates appear optimistic. For State Highway Fund revenue, the Oregon Legislature did not increase gas taxes or other fees in their 1995 session. While some increase will probably occur in the future, the increases may not be as large as those assumed by the forecast committee, reducing the revenue to the State Highway Fund relative to that estimated by the ODOT forecast committee. This reduction may be offset by growing per capita vehicle-miles traveled (VMT); we doubt per capita VMT will actually decline as assumed by the ODOT forecast committee. This would increase revenue to the State Highway Fund relative to that estimated by the ODOT forecast committee.

ODOT's estimate of State Highway Fund revenue is shown in Table 16. This estimate shows the State Highway Fund is expected to grow faster than inflation (the ODOT forecast committee assumed annual inflation will be 3.7 percent) in early years, but grow slower than inflation after 2005.

TABLE 16
ESTIMATED STATE HIGHWAY FUND REVENUE
(IN MILLIONS OF CURRENT DOLLARS)

Year	Revenue	Average Annual Growth Rate
1996	$584.3	
1997	$628.3	7.0%
1998	$665.0	5.5%
1999	$712.2	6.6%
2000	$764.7	6.9%
2005	$963.6	4.7%
2010	$1,110.0	2.9%
2015	$1,248.9	2.4%

Source: Oregon Department of Transportation. 1995. *Financial Assumptions for the Development of Metropolitan Transportation Plans.*

To estimate the funding available for modernization and capacity additions, the ODOT committee estimated the *total* level of state and federal transportation revenue in Oregon through 2015, and then subtracted out the funding necessary to maintain and preserve existing infrastructure and services.[10] The result shows annual funding available for highway modernization is expected to grow much faster than inflation through 2005, then decline in both current and inflation-adjusted dollars through 2020. After adjusting for inflation (using the annual rate assumed by the ODOT forecast committee, 3.7 percent), modernization funds in 2015 would be slightly more than the 1998 level, and would decline to about 1/3 of the 1998 level by 2020. This estimate suggests that without increases in existing revenue sources or new revenue sources, state funding for transportation projects will decline after 2005.[11]

Transportation Funding in Columbia County

Road-related revenue and expenditures in Columbia County for fiscal years 1992-93 to 1995-96 are shown in Table 17. This table reports expenditures from the county's Construction/Maintenance Department-Roads/Bridge/Equipment fund, and revenue from the Road Department-Resources fund. The revenues from these funds are summarized by their source and the expenditures are summarized by type.

[10] Ibid.

[11] Such shortfalls, however, are typical of long-run forecasts that compare costs and revenues: the sources of costs are relatively easy to identify and forecast; revenues almost always require new programs or other legislative changes that are uncertain.

Road-related revenues in Columbia County have ranged from $2.4–$4.5 million in fiscal years 1992-93 to 1995-96. The largest source of transportation revenue in Columbia County is the State Highway Fund, which contributed $1.7–$2.1 million annually in the period shown in Table 17, about 2/3 of total revenue in most years.

Federal revenue accounts for only 1 to 8 percent of the county's road-related revenue. The ODOT Fund Exchange is federal revenue that is exchanged with ODOT for state funds because there are fewer restrictions on the use of state funds. HBRR Reimbursement revenue is from the Highway Bridge Replacement and Rehabilitation program, part of ISTEA.

Local Fees and Assessments contributed $375,000–$2.1 million per year over the last four years, or 13 to 47 percent of total transportation revenue in Columbia County. Revenue from this source has declined in the last two years for two reasons. First, significant revenue from Timber Revenue has declined to $0; this revenue was from one-time only charges to logging operations for their damage to county roadways. Second, the county's Systems Development Charge was rescinded by voters. The largest local source of road-related revenue is now Aggregate Mining Fees paid by gravel mining companies in the county; these fees contributed $317,000–$483,000 annually in the four years shown in Table 17. Permit revenue has contributed about $14,000–$15,000 annually.

Columbia County spent $2.4–$4.1 million annually for transportation, almost all of which was spent to maintain the county's existing system of roads. The county has recently made capital improvements to Apiary Road and Canaan-Meissner Road which link Highway 30 and the interior of Columbia County; the cost of these projects are not identified in the county's budget. The Debt Service expenditures are to repay loans used for heavy equipment purchases.

In addition to the funds shown in Table 17, Columbia County has a Footpath Bicycle Trail Resources fund that currently contains almost $97,000. These funds have apparently not been spent in the four year period covered in the 1995-96 Adopted Budget.

TABLE 17
TRANSPORTATION-RELATED REVENUES AND EXPENDITURES IN COLUMBIA COUNTY, FISCAL YEAR 1992-93 TO 1995-96 (IN CURRENT DOLLARS)

Revenue Source/ Expenditure Program	1992-93 Actual	1993-94 Actual	1994-95 Revised	1995-96 Adopted
Operating Capital	264,520	563,973	1,025,000	504,136
Total Revenues	**2,551,568**	**4,518,590**	**3,119,400**	**2,987,479**
Federal Funds	**31,502**	**303,439**	**155,000**	**249,260**
US Land Sales	4,339	3,111	5,000	5,000
HBRR Reimbursement	0	0	0	244,260
ODOT Fund Exchange	27,163	300,328	150,000	
State Highway Fund	**1,738,095**	**2,054,383**	**2,084,400**	**2,124,719**
Fees and Assessments	**772,228**	**2,143,048**	**420,000**	**375,000**
Aggregate Mining Fees	241,276	286,393	300,000	300,000
Permits	14,091	14,751	15,000	15,000
System Development Charges	0	81,957	40,000	0
Timber Revenue	455,181	1,660,010	0	0
Other Fees, Sales, and Reimbursements	61,680	99,937	65,000	60,000
Transfers From General Fund	**0**	**0**	**450,000**	**150,000**
Miscellaneous Income	**9,743**	**17,720**	**10,000**	**88,500**
Total Expenditures	**2,389,754**	**4,096,424**	**4,144,400**	**3,491,615**
Personal Services	**984,997**	**1,124,320**	**1,305,884**	**1,242,067**
Materials and Services	**1,038,594**	**1,745,216**	**2,135,935**	**1,539,222**
Capital Improvements	**84,566**	**1,142,843**	**553,500**	**143,500**
Road Repairs	0	1,066,736	450,000	0
S.D.C Improvements	12,185	758	0	0
Equipment	72,381	75,349	103,500	143,500
Road Fund Contingency	**220,000**	**0**	**50,000**	**465,000**
Debt Service	**61,597**	**84,045**	**99,081**	**101,826**

Source: Columbia County Adopted Budget 1995-96, summarized by ECONorthwest.
Note: Items in bold are subtotals of the indented items below.

Outlook for Transportation Revenue in Columbia County

The ODOT forecast committee expects the State Highway Fund to grow faster than inflation through 2005 and slower than inflation afterwards. County's share of the State Highway Fund should follow a similar trend, keeping slightly ahead of inflation through 2005 and then declining in terms of today's dollars. The State Highway Fund will remain a stable source of transportation funding and will probably continue to contribute about 2/3 of total transportation revenue in the county in the next ten years, unless additional funding sources are implemented.

Fees and Assessments will probably remain about 15 percent of total transportation revenue unless the county implements new funding sources or increases the rate of existing assessments. The recent voter rescission of the county's systems development charge suggests that political opposition to fees and taxes may limit the county's ability to implement new funding sources. The county could increase the rate of existing assessments, but this may be also be limited by anti-tax sentiment, and large increases would be necessary to generate significant increases in revenue. Population growth in Columbia County may lead to increased revenue from Fees and Assessments, but any increased revenue will be offset by an increased need to maintain and expand the transportation system.

In our judgment the county's ability to maintain and expand the transportation system will, at best, remain stable, and may deteriorate. Population growth and aging infrastructure will increase the demand for transportation services, while anti-tax sentiment and the capacity of existing local revenue sources will limit the county's ability to increase revenue.

Transportation Funding in Scappoose

Road-related revenues and expenditures in the City of Scappoose are shown in Table 18. This table combines revenues and expenditures from the Street, Major Improvement, and Street SDC funds. The largest share of transportation revenue in Scappoose comes from the city's share of the State Highway Fund and other state revenues, which contributed about 82 to 86 percent of total revenue in the two years for which actual dollars are reported.

The City of Scappoose has not received any funds from Columbia County for transportation in the four years shown in Table 18. Columbia County occasionally contributes funds or work on transportation projects, but there is not a standing agreement between the city and county on funding projects within Scappoose. The county is responsible for roads outside the city limits but within the Urban Growth Boundary, and for roads that are not up to urban standards in areas that were annexed by the city.

Locally-generated revenue contributes most of the remaining 14 to 18 percent of total revenue. The largest source of locally-generated revenue is the city's Systems Development Charge (SDC), which contributed about $3,000 to $11,000 in the two years for which actual dollars are reported. The city has budgeted SDC revenue at $200,000 in FY 1995-96 from development of a Fred Meyer store. In fact, the city received $272,000. This revenue will be used for improvements to Old Portland Road, which runs behind the Fred Meyer site, parallel to Highway 30.

The City of Scappoose does not have a fund to track revenues for parks or open space, and some of these funds are reported in the Street and Major Improvement fund and are included in the last two years shown in Table 18. These funds are not transportation-related, and so transportation revenues and expenditures are somewhat overstated in the last two years of Table 18. Fifty thousand dollars of miscellaneous revenue for FY 1994-95 is from the Watts House Historical Grant and a transfer from the Library District for parking spaces on the City Square. A $35,000 transfer from the general fund in FY 1995-96 is for improvements to the City Square. These revenues are included in Table 18 because corresponding expenditures are not identified in budget documents, and we could not remove the revenue without also reducing expenditures.

Most transportation expenditures in Scappoose are made to maintain and repair existing infrastructure. The only recent projects that added capacity to the transportation system were an overlay and sidewalk addition to First Street between Maple and Smith, and a widening of Second Street between Olive and Myrtle with addition of curb, gutter, and sidewalk. Table 18 shows expenditures for the First Street project were about $156,000 over two years. Most of the Transfers to Other Funds in 1994-95 were funds transferred to the Reserve Fund to construct bicycle paths. With planned SDC expenditures in the two budgeted years and expenditures for bicycle paths, Scappoose will have spent an average of about $75,000 per year for capacity additions to the transportation system.

TABLE 18
TRANSPORTATION REVENUES AND EXPENDITURES IN SCAPPOOSE
1992-93 AND 1994-95 (CURRENT DOLLARS)

	1992-93 Actual	1993-94 Actual	1994-95 Adopted	1995-96 Adopted
Cash on Hand	$399,088	$285,560	$222,134	$142,070
Total Revenue	**$191,203**	**$212,665**	**$308,082**	**$463,290**
State Revenue	**$164,625**	**$175,076**	**$205,880**	**$181,911**
State Highway Fund	$153,871	$163,147	$168,880	$169,911
State Revenue Sharing	$10,754	$11,929	$12,000	$12,000
Special City Allotment	$0	$0	$25,000	$0
Systems Development Charge	**$2,735**	**$10,652**	**$17,350**	**$200,000**
OYCC Grant/MTC Funding	**$0**	**$8,611**	**$9,000**	**$5,555**
Miscellaneous	**$7,331**	**$180**	**$50,852**	**$6,000**
Cash-in-lieu	**$0**	**$0**	**$16,000**	**$0**
Infrastructure Inspection Fees	**$0**	**$0**	**$1,500**	**$7,500**
Transfers From Other Funds	**$2,500**	**$9,100**	**$2,000**	**$36,769**
Interest	**$14,012**	**$9,046**	**$5,500**	**$25,555**
Total Expenditures	**$304,732**	**$263,139**	**$459,927**	**$384,758**
Personal Services	**$84,109**	**$106,250**	**$94,031**	**$90,086**
Material and Services	**$69,248**	**$62,793**	**$125,664**	**$150,843**
Capital Outlay	**$149,836**	**$42,041**	**$166,359**	**$128,055**
W. First St. Project	$141,893	$14,498	$0	$0
Street Capacity-SDC	$0	$0	$33,215	$95,000
Equipment & Other	$7,943	$27,543	$133,144	$33,055
Transfers to Other Funds	**$1,539**	**$7,055**	**$18,770**	**$4,371**
Bancroft Bond Fund	**$0**	**$45,000**	**$34,298**	**$0**
Contingency & Reserve	**$0**	**$0**	**$20,805**	**$11,403**
Unappropriated Ending Balance	$285,559	$238,386	$77,185	$281,578

Source: City of Scappoose Budget 1995-96.
Note: Items in bold are subtotals of the indented items below.

Outlook for Transportation Revenue in Scappoose

The ODOT forecast committee expects the State Highway Fund to grow faster than inflation through 2005 and slower than inflation afterwards. Scappoose's share of the State Highway Fund should follow a similar trend, keeping slightly ahead of inflation through 2005 and then declining slightly in terms of today's dollars. The State Highway Fund will remain a relatively stable source of transportation funding, and it will probably continue to contribute over 60 percent of the city's road-related revenue for the next ten years. Table 19 shows the estimated amount of funds Scappoose could receive from the State Highway Fund if the local share grows at the same rate as the forecasted Fund total.

TABLE 19
ESTIMATED STATE HIGHWAY FUND REVENUE SHARED WITH SCAPPOOSEIN SELECTED YEARS (1995 DOLLARS)

Year	Dollars
1996	$175,000
2000	$195,000
2005	$205,000
2010	$195,000
2015	$185,000

Revenue from the Systems Development Charge will depend on the future level of new construction. Forecasts in the Transportation System Plan show significant growth is expected in Scappoose over the next 20 years.[12] Table 20 estimates the future level of annual SDC revenue in selected years, based on housing and employment growth rates in the Scappoose TSP and existing SDC rates per dwelling unit and employee for different development types.[13]

[12] David Evans and Associates, *Scappoose TSP—Preliminary Draft*, January 1996, p. 27. Note that these forecasts of growth are not based on an explicit consideration of the feedback of transportation level of service and costs on growth (e.g., if Scappoose has to substantially increase fees or taxes to pay for maintenance and improvements, it may get less growth than the TSP assumes).

[13] For two types of development we had to make assumptions to translate the employment forecast into the units on which the SDC rate is based. The SDC rate for commercial development is $1,780 per 1,000 sq. ft. of building space; we assumed there will be 1.0 employees per 1,000 sq. ft., based on a 1990 employment density study. The SDC rate for schools is $45 per student; we assumed there will be 20 students per school employee.

TABLE 20
ESTIMATED FUTURE SDC REVENUE IN SELECTED YEARS
(1995 DOLLARS)

Year	Annual Revenue
1996	$46,000
2000	$52,000
2005	$64,000
2010	$77,000
2015	$94,000

The estimates shown in Table 20 total $1.3 million in the 1996–2015 period (in 1995 dollars). Using the time periods in the TSP, SDC revenue is estimated to total $246,000 in Years 1–5, $297,000 in Years 6–10, and $791,000 in Years 11–20.

The estimates in Table 20 assume a constant annual growth rate through the 1996–2015 period. In fact, new development will fluctuate, with large amounts of new development in some years and little development in others, and actual SDC revenue will fluctuate along with the level of new development. An example of this is the recent Fred Meyer development, which contributed $272,000 in SDC revenue in one year.

Aside from the State Highway Fund and SDCs, Scappoose does not have any other significant sources of revenue that are dedicated to transportation. The city has transferred funds from the General Fund to the Street Fund, but this transfer was for improvements to the City Square. Given competing uses for General Fund revenue, it appears unlikely that the General Fund will make significant contributions for transportation revenue in the future. Remaining sources do not contribute a significant amount of revenue, and the city has little control over the amount of revenue they generate.

To estimate the level of future funds available for capital expenditures by the City of Scappoose, we started with our estimates of State Highway Fund and SDC revenues above and made the following assumptions:

- State Highway Fund and SDC revenue will contribute the same share of total revenue as they did in the 1992–1996 period (see Table 18), 76 percent.

- The total revenue used for Capital Expenditures will be the same share of total revenue as it was in the 1992–1996 period (see Table 18), 29 percent.

The results of applying these assumptions to the estimated level of State Highway Fund and SDC revenue are in Table 21, which shows the estimated level of capital expenditures by the city in selected years and for the time periods used in the TSP. Table 21 shows the decline in State Highway Fund revenue after 2005 offset by growing SDC revenue. These assumptions lead to the conclusion that the City of Scappoose can fund capital expenditures totaling about $2 million in the 1996–2015 time period from existing revenue sources.

TABLE 21
ESTIMATED ABILITY TO PAY FOR CAPITAL EXPENDITURES FOR TRANSPORTATION BY THE CITY OF SCAPPOOSE, BY SOURCE AND TIME PERIOD (1995 DOLLARS)

Time Period	SDC Revenue	Other Funds	Total
Years 1-5	$246,000	$194,000	$440,000
Years 6-10	$297,000	$198,000	$495,000
Years 11-20	$791,000	$251,000	$1,042,000
Total	$1,334,000	$643,000	$1,977,000

FINANCING OPTIONS FOR TRANSPORTATION PROJECTS

Most local governments are finding revenues from taxes or user charges inadequate to fund all the needed infrastructure projects in a timely manner. The two common categories of approaches to funding infrastructure are pay-as-you-go, and debt financing.

This memorandum distinguishes between the terms *funding* and *financing. Funding* describes any mechanism that generates revenue for transportation-related projects. Construction, operation, maintenance, and repair of transportation facilities require money—money that ultimately comes in one way or another from businesses and households that are selling goods, services, or labor. They give up some of the money—some of their resources—to fund public goods and services like transportation. The many different ways that government can collect that money from them are funding mechanisms.

Financing more narrowly refers to ways to spread out the impact of collecting funds through the issuance of debt obligations that are repaid over time, with interest. In other words, all transportation projects are funded by some means; some funding is financed by borrowing money to pay for the projects. Given the resources (funding), governments may choose to pay as they go or to use financing to smooth out payments (especially for large, one-time improvements). Funding can occur on a pay-as-you-go basis or through various financing mechanisms.

If a government chooses to *pay as it goes*, it pays for infrastructure costs directly from current revenues. Revenue sources commonly used for this approach include taxes, fees and user charges, interest earnings, and grants. These specific approaches are obviously quite different. Local governments, for example, clearly have a preference for grants or transfers such as state and federal funding programs. Only when grants are exhausted must local governments look to the resources of their own citizens, who then typically pay either through taxes or user charges. The advantages of this approach include reduced interest, increased flexibility, enhanced debt capacity, improved borrowing terms, and increased fiscal responsibility. The major disadvantages of this approach are insufficient funding, intergenerational inequity (if, for example, long-term facilities are paid for disproportionately by current users), inconsistency of funding requirements, and use of accumulated reserves.

Debt financing requires local governments to raise money though the issuance of debt obligations, usually bonds. (These bonds, as noted, must be backed by a revenue [funding] source.) A more simple term for this approach is *borrowing*. These obligations are then paid back over time, with interest. The primary advantages of debt financing are that improvements can be financed as needed, intergenerational equity (future residents pay for part of long-term facilities), repayment in cheaper dollars (if inflation is significant), and enhanced stability.

Disadvantages include interest costs, encumbered future revenues, and limits on the amount of debt that can be issued. We will discuss financing transportation projects at the end of this section, after we have identified federal, state, county, and local sources that could be used to fund projects on a pay-as-you-go basis.

We describe federal and state programs that are the most likely to contribute funds for transportation projects in Scappoose, and we identify several local funding sources that could be implemented. We summarize the federal and state programs and local funding sources in the Appendix in Table D-1.

Why a Consideration of "Who Pays" is Critical to Funding Decisions

In this section we describe many options that local governments can use to raise funds for transportation projects. We have evaluated these funding sources based on standard criteria: legal authority, fiscal capacity, stability, and administrative feasibility. Once suitable funding sources have been identified with these criteria, there are two remaining criteria that affect which source the city should pursue: equity and political acceptability.

The equity criteria identifies who would pay if a particular funding source is implemented. Political acceptability asks the question "Who *should* pay?" The only right answer is "It depends." It depends on people's feelings about what is fair and on their ability to persuade decision makers of their position. The answer to the question "Who pays?" is critical to both citizens and policy makers. The purpose of this section is to provide local decision makers and the public with information to help answer that question. We hope that this section will provide the background necessary for the public and its decision makers to have a discussion about the best sources of local funding. A decision on local funding sources will become critical after capital improvements have been identified and their costs estimated.

Transportation improvements are not free: somebody has to pay. From the perspective of people in the Scappoose area, almost any reasonable improvements to the state highways make sense. The state pays to improve traffic flows for drivers, bicyclists, and pedestrians. Unless such projects have bad side effects (e.g., business closures, environmental damage, long-run impacts on development patterns), the city will not oppose those projects. It will, in fact, seek to tie as many of its transportation improvements as possible to state highways and state funding. Similarly if the Scappoose area could find grants or transfers from non-local sources (federal or state), residents would, in general, prefer those sources to local ones. Such self-interest is an important part of efficient local government.

Though we suggest federal and state programs the city could pursue to fund transportation projects, planners and decision makers in the Scappoose area have probably pursued all grants that the city might be eligible for. Most of the federal and state funds available in the Scappoose area will be used for the maintenance of state highways (US 30). Federal and state funds that could be used on local projects will be earmarked for specific types of projects, despite the increased flexibility provided by ISTEA. Past experience suggests that the city should expect only occasional contributions from Columbia County.

Given these circumstances, existing federal, state, and local funding sources in Scappoose are probably not sufficient to fund necessary projects recommended in this Transportation System Plan. The needed funding can only come from actions taken by the City of Scappoose area to take money from people as they live, work, shop, or pass through the Scappoose area.

From whom should the city take the money? There is a substantial professional literature in public finance, public administration, and economics about principles for determining who should pay; about what's fair. In summary the basic principles reduce to:

> *People should pay based on either the costs they impose or the benefits they receive, unless they belong to some group that deserves special treatment.*

That principle, of course, leaves all the details to be answered on a case-by-case basis: what are the costs; what are the *full* costs (e.g., drivers create noise in neighborhoods—should they pay for that?); what if people generating the costs are not the same as those enjoying the benefits; who decides what special groups are; and so on? Because these details can be extensive and complex, and because details might be weighted differently in different analyses, there is no generally accepted right answer to the question "Who should pay?" It depends.

Though most analysts accept some version of the basic principle as stated above, they also recognize that it is usually in the interest of a local decision makers to act on a more political and pragmatic principle: charge as much as you can to people who don't live in the area and don't vote in local elections. Obviously, there must be some relationship between the charge and use, but that relationship can be indirect. In the case of local road improvements, any funds that are tied to *use* of roads directly (e.g., tolls), indirectly (e.g., gasoline taxes), or very indirectly (e.g., sales tax, since people in stores had to travel through the area to get there) are possible. From a local jurisdiction's perspective, for any given revenue requirement, funding by charging for use will cost local users less (in the aggregate) because non-local users would also pay.

Funding based on use has merit not only on the grounds of fairness, but also efficiency: if drivers have to pay for their use in ways that are closely tied to their amount of use (e.g., tolls and gas taxes), they will use the facilities less and thus delay the need for improvements.

Another question important to the local public and decision makers: of that amount being funded by local taxes and fees, who in particular, or what groups in general, are paying. This question is typically viewed several different ways: businesses vs. residents, high income (or property value) vs. low income (or property value); owners vs. residents; current residents vs. future residents.

Implications for Funding Transportation Improvements

Federal, state, and county funding sources are typically the most politically acceptable option for cities because they do not require additional local taxes or fees. An important point about federal funds is that the state distributes these funds to counties and cities through the Oregon Department of Transportation. References to state funding below include both federal and state sources of revenue.

If local sources must be used, jurisdictions often seek to charge those who benefit most: users of the improvements, adjacent property owners, and new development. Cities also seek to reduce the cost of additional fees or taxes to citizens by spreading the costs among a large group that includes non-residents, if possible. We expect Scappoose will want to pursue funding sources for transportation improvements in the following order:

- Use federal, state or Columbia County funds first. Get more projects or funds from the state or county, or tie what might otherwise be local projects (e.g., sidewalks and bike paths) to state or county highway projects.

- For whatever projects that the state and county will not pay for, the city should decide which are important enough to fund locally, and which projects should be deferred until outside sources of funds can be found or more important needs are met.

- For the projects that the city will seek to fund locally, use System Development Charges and assessments to charge new development and property owners that are served by the improvement, where possible and appropriate.

- For projects that do not tie directly to new development or benefit property owners that are willing to pay for the project, fund projects from citywide funding sources.

- Scale back or eliminate the proposed improvements.

Given this hierarchy of recommendations, we discuss below likely funding sources for transportation improvements by lead jurisdiction: ODOT, Columbia County, and Scappoose. Table 31 at the end of this section summarizes the criteria for specific transportation funding sources at the federal, state, and local level, and the potential for these sources to fund projects in Scappoose.

POTENTIAL FUNDING FOR TRANSPORTATION SYSTEM IMPROVEMENTS

Decisions about which funding sources to use for specific projects are made only a few years, at most, before a project is started. The sources that are used depend on circumstances at the time when funding decisions are made, such as the type of project, characteristics of the area served by the project, the availability of federal, state, and local funds. Most transportation projects are funded by a mix of funds from federal, state, or local sources.

In this section we discuss potential funding sources for projects in the *Scappoose Transportation System Plan* (TSP). We discuss the projects in the TSP that could be funded by each source based on legal limitations, program criteria, availability of funds, and the type of projects these sources have funded in the past. After this discussion we make assumptions about funding for specific projects to recommend a funding strategy for the City of Scappoose.

Federal and State Funding

ODOT is responsible for maintaining state highways, and so ODOT should fund improvements to Highway 30 in the TSP. In addition, some county and city projects would affect the operation of Highway 30 and so may be eligible for ODOT-administered federal funding from the *Surface Transportation Program* and state funding from the *Oregon Highway Fund.* These projects fall into three categories:

- Projects that would affect intersections on Highway 30 may be eligible for ODOT funding for the intersection portion of the project, particularly if these projects are coordinated with other ODOT-funded projects on Highway 30. Projects that would modify existing intersections or create new intersections with Highway 30 include project number (#) 15 in Years 1–5, numbers 17, 30, 32, 33 and 38 in Years 6–10, and numbers 54, 60, and 62, in Years 11–20 (see Table 14). The city should work with the ODOT Region 1 planner to see if any of these projects can be

coordinated with ODOT projects on Highway 30 or otherwise receive ODOT funding for the intersection portion of the projects. In these cases, ODOT funding is uncertain and it would be only a small portion of total project cost.

- Projects that would improve the operation of Highway 30 may be eligible for ODOT funding.[14] The projects that are most likely to improve operation of Highway 30 are those that would improve or construct new alternative north-south routes for local traffic. These projects include improvements to and extension of Old Portland Road (#s 14 and 17), Fourth Street W. (#53), and West Lane Road (#s 59 and 60). To secure ODOT funding for these projects, the city would need to model traffic patterns to show the project would improve operation of Highway 30. If so, ODOT may provide a significant share of the total project cost. ODOT funding for these projects, however, is speculative.

- ODOT typically shares the cost of maintaining and improving signals on intersections of county or city roads and state highways. ODOT will probably contribute 50 percent ($25,000) of the total cost to modify the existing traffic signal at Highway 30 and Scappoose-Vernonia Highway (#11 in Years 1–5).

There are several federal and state programs administered by ODOT that fund specific types of improvements and that could contribute funds for projects in Scappoose. We summarize the criteria and potential of these funding sources to contribute funds in Appendix D, Table D-1 at the end of this section.

- The *Transportation Enhancement Program* contributes funds for projects that would improve bicycle and pedestrian facilities. In Oregon, these funds have been spent primarily on off-street bicycle/pedestrian paths. The only county or city project that appears to qualify for funds from this program is the Scappoose Creek Bike Path (#65) in Years 11–20, with a total cost of $1.1 million. To secure funding for this project, the city needs to work with the ODOT Region 1 planner to have it included in the STIP; the city may want to improve it's chances of funding this project by segmenting the project into several parts and pursuing funding earlier than the Year 11–20 period. Several projects of this cost magnitude are included in the current STIP along with many smaller ones, so there is a good chance ODOT will fund this project. This program requires a non-federal match of 20 percent for bicycle/pedestrian facilities.

- The *Highway Enhancement Program* contributes funds for safety improvement projects where it can be shown that the project will reduce the frequency and/or severity of accidents and the cost/benefit ratios of the project is greater than one. The TSP reports the number and rate of accidents at intersections along Highway 30 in Scappoose; the accident rates are below national and state averages. Many of the county and city projects in the TSP would improve safety along with other justifications (see Table 14), but the TSP does not evaluate projects in terms of the criteria used by this program. This program may fund the only project that has safety as its singular justification: the school area traffic control improvements in Years 1–5 ($100,000). The

[14] Providing a better network of local streets (alternative routes) in urban areas to reduce the need for Highway 30 improvements is a key strategy identified in the Portland-Astoria Corridor Plan, according to David Evans and Associates, Inc., *Scappoose Transportation System Plan—Draft*, January 1996, p. 7.

city should work with the ODOT Region 1 planner to determine whether this or projects might be eligible for funding from this program. This fund requires a 10 percent local funding match.

- The Special City Allotment is a grant program available to cities with a population less than 5,000. Cities must submit specific projects to ODOT for consideration. Projects are reviewed annually and ranked on a statewide basis by a committee of regional representatives; funds are distributed based on this ranking. ODOT distributes a total of $1 million annually through this program—individual projects are eligible for a maximum of $25,000 each. Scappoose has received one $25,000 grant through this program in the four fiscal years shown in Table 18.

- The Immediate Opportunity Fund is administered by ODOT but is used primarily in conjunction with projects funded by the Oregon Economic Development Department (OEDD). This program is intended to fund infrastructure improvements where an immediate commitment of funds is required to attract or retain industrial and some commercial firms that will provide jobs. There is no information in the TSP to indicate that any of the projects meet this criteria, however, in the future some projects may become critical to attract or retain an employer and so be eligible for funding through this program.

- The Oregon Bicycle and Pedestrian Program provides grants up to $50,000 for projects that would improve bicycle or pedestrian facilities, including pedestrian islands in roadway medians, construction or striping of bicycle lanes on roadways, and provision of sidewalks. This program distributes a total of $450,000 annually to Oregon cities and counties; projects funded for fiscal year 1997 have a cost range of $5,600–$80,000. Many projects in the TSP would be eligible for partial funding through this program. All of the urban upgrade (road widening) projects would add bike lanes to roadways, and several projects would add sidewalks and/or bike lanes in existing right-of-way (numbers 4, 5, and 8 in Years 1–5, numbers 18–20, 31, and 35 in Years 6–10). One project would construct a new off-street bike path along Scappoose Creek (#65 in Years 11–20). Scappoose should work with the ODOT Region 1 planner to submit projects for consideration to the Bicycle and Pedestrian Advisory Committee.

In addition, there are two federal and state funding programs that could contribute to transportation projects in Scappoose but are not administered by ODOT:

- *Community Development Block Grants* are administered by the Department of Housing and Urban Development. CDBG must be used in areas where 51 percent of residents are low- or moderate-income. CDBG funds are not typically used for transportation projects, and Scappoose may have other priorities for these funds. The City of Medford has used CDBG funds for transportation, to provide sidewalks and street lighting in older parts of town. CDGB funding would require city staff to write an application and, if successful, provide audit and compliance reports. The overall potential of the CDGB program to fund transportation projects in Scappoose is low.

- The *Special Public Works Fund* is administered by OEDD. This program provides loans and grants to fund infrastructure in commercial/industrial areas to support local economic development. The project must help create or retain a minimum of 50 jobs to receive funding through this program. There is no information in the TSP to indicate that any of the projects

would currently meet this criteria, but several projects would serve areas designated for commercial or industrial development; these projects are indicated in Appendix A with an economic project justification.

County Funding

Almost all of the projects for which Columbia County is the lead jurisdiction are urban upgrade projects that would bring roadways to urban standards by widening and constructing curbs, gutters, and sidewalks. Columbia County has spent about $2.4–$4.1 million annually for transportation in the last four fiscal years, almost entirely to maintain the existing roadway system. The county has spent very little money on urban upgrade or other projects to increase roadway capacity. The county's road department indicated that a lack of funding has prevented the county from upgrading streets to urban standards in areas that have been annexed by cities. This has occurred despite an incentive for the county to upgrade—cities can and have refused to accept roads that are not built to urban standards, leaving the county responsible for maintenance of these roads. This suggests that with the existing level of revenue, urban upgrade projects will be a low priority for the county given other demand for transportation funds, and there will be little funding available from the county for these projects.

The City of Scappoose is listed as a financial partner for all of the projects for which Columbia County is indicated as the lead jurisdiction. In the past, however, the county has participated in only a few improvement projects in Scappoose, even on county-maintained roads. Therefore, the city will need to take the lead on these projects by working with the county to identify the projects most in need of limited county funding, and by working to obtain additional state and local funds for these projects. Ben Shaw, Scappoose Public Work Director, expects the county urban upgrade projects to be funded by a partnership between the county, city, and adjacent property owners. Almost all of the county projects have an access or economic justification (see Table 14), indicating that they would serve adjacent residential and commercial development that may contribute to project funding through Systems Development Charges or special assessments.

We include the county projects in our discussion of city projects in the following section. This reflects the reality of the situation faced by the City of Scappoose—the city will need to take the lead by identifying the most needed projects and by assembling the funding from various sources, and the county will probably not make substantial contributions to many projects.

Local Funding

The existing funding sources for transportation in the City of Scappoose were discussed at the beginning of this section. State funds (primarily from the State Highway Fund) and SDC revenue contributed an average of 82 percent of total revenue in the last four years. In the next section we discuss potential revenue from increases in the city's SDC rates and additional funding sources the city could pursue if needed.

FUNDING RECOMMENDATIONS FOR TRANSPORTATION SYSTEM IMPROVEMENTS

Table 22 summarizes the total cost to fund the projects in the TSP by lead jurisdiction and time period. This table shows that most of the projects are planned for the Years 11–20, even when accounting for the 10 years in period compared to 5 years in the other periods. 62 percent of the project costs are in the Years 11–20 period. The lead

jurisdiction with the greatest project cost is Columbia County with $21.2 million, followed by Scappoose with $12.5 million and ODOT with $602,000. Most of the costs for projects on which the county and city are lead jurisdictions are planned for Years 11–20. Table 14 describes each project's location, description, the mode of travel improved, justification, phasing, financial partners, and cost.

DEA estimated project costs by estimating the 1995 cost per mile for various types of projects and applying those costs to the projects included in the TSP. These estimates reflect what each project would cost today, even though most of these projects will cost more when they are built in the future because of inflation. Estimating future costs in 1995 dollars is very useful because it expresses the need future expenditures in terms readers can easily understand—the value of a dollar today. In this report, we will discuss whether existing revenue sources for each jurisdiction will grow faster or slower than the inflation rate, and therefore, whether future revenue will be greater or less than existing revenue in today's dollars. We can then compare the need for future expenditures (in today's dollars) with the likely level of revenue available from existing sources (in today's dollars). If it appears that existing sources of revenue will not cover needed expenditures, we will use the criteria and process described above to evaluate additional sources of revenue.

TABLE 22
SUMMARY OF PROJECT COSTS BY TIME PERIOD AND LEAD JURISDICTION
(1995 DOLLARS)

Time Period	ODOT	County	City	Total
Years 1–5	$477,000	$797,000	$1,109,300	$2,383,300
Years 6–10	$125,000	$4,181,500	$2,839,100	$7,145,600
Years 11–20	$0	$16,227,000	$8,533,500	$24,760,500
Total	$602,000	$22,205,500	$12,481,900	$34,289,400

Go Ahead with Projects for Which There is Substantial Federal and State Funding

The five projects for which ODOT is the lead jurisdiction are all improvements to Highway 30 (see Table 14). These projects involve the modification of traffic signals, realignment of intersections, construction of a pedestrian island, and installation of new traffic signals. The cost of these projects is relatively minor compared to the level of expenditures in the 1995–1998 STIP—for example, in 1995 ODOT showed $35.6 million to widen Highway 30 and provide curbs and sidewalks through St. Helens. ODOT funding of these projects will require their inclusion in the STIP, which depends on competing demands for transportation funds statewide and within ODOT's Region 1. The STIP is updated on a two-year cycle. The City of Scappoose should coordinate with the ODOT Region 1 planner to submit projects for inclusion in the STIP in the current cycle. For the analysis in this report, we assume ODOT will fully fund the projects in Table 23.

TABLE 23
ODOT-FUNDED PROJECTS (1995 DOLLARS)

Number	Location	Description	Total Cost
	Years 1–5		
1	Signalized Intersections along Hwy. 30	Signal Head Modifications	$15,000
2	Signalized Intersections along Hwy. 30	Coordinate Signal Timing	$10,000
10	Highway 30 and Scappoose-Vernonia Hwy.	Realign west approach and intersection improvements	$432,000
13	Highway 30 and Williams St.	Provide Pedestrian Island in highway median	$20,000
	Years 6–10		
39	Highway 30 and Williams St.	Install new traffic signal	$125,000

In addition, ODOT may fund portions of projects that improve the operation of Highway 30 or that meet the criteria of specific funding programs. To estimate the amount of additional ODOT funding for other projects in Scappoose, we made several assumptions based on the types of projects in the TSP, criteria for specific funding programs, and the types of projects these programs have funded in the past. The assumptions we describe below are based on an overall assumption that existing federal and state programs will continue to be funded at current levels:

- ODOT will contribute 50 percent ($25,000) of the cost to modify the existing signal at Highway 30 and Scappoose-Vernonia Highway in Years 1–5 (#11).
- ODOT-administered programs will fund 80 percent ($864,000) of the cost of the bicycle/pedestrian path along Scappoose Creek in Years 11–20 (#65).
- Scappoose will receive a Special City Allotment grant of $25,000 every four years.
- The Oregon Bicycle and Pedestrian Program will fund 50 percent of the projects that would add bicycle lanes and/or sidewalks to existing right-of-way (#s 4, 5, and 8 in Years 1–5 and #s 18–20, 31, and 35 in Years 6–10).
- Contributions from other funding programs are too speculative to count on at this time.

We must emphasize that the points above are assumptions about the level of funding available to Scappoose from federal and state sources. We have attempted to be conservative. We did not assume Scappoose would receive funds from programs that have criteria for which we do not have information, such as the safety criteria used by the Highway Enhancement Program. For projects where ODOT would contribute less than 100percent of the total project cost, local matching funds will be required to receive the ODOT funds and fund the project. The contributions from ODOT and the required Local match, based on our assumptions, are shown in Table 24.

TABLE 24
ODOT CONTRIBUTIONS FOR LOCAL PROJECTS (1995 DOLLARS)

#	Location	Description	ODOT Contribution	Local Match	Total Cost
	Years 1–5				
4	Maple St., Hwy. 30 to First St. W.	Restripe existing pavement to provide bike lanes	$500	$500	$1,000
5	Maple St., Hwy. 30 to First St. W.	Provide curb, gutter, and sidewalks on both sides	$19,750	$19,750	$39,500
8	High School Drive, Hwy. 30 to Sixth St. E.	Add sidewalks and re-stripe with bike lanes	$25,900	$25,900	$51,800
11	Hwy. 30 and Scappoose-Vernonia Hwy.	Modify existing traffic signal	$25,000	$25,000	$50,000
	Years 6–10				
18	Walnut Rd., Hwy. 30 to Old Portland Rd. extension	Re-stripe existing pavement to provide bike lanes	$700	$700	$1,400
19	Fourth St. W., Creekview Plaza to E.M. Watts Rd.	Re-stripe existing pavement to provide bike lanes	$2,600	$2,600	$5,200
20	Fourth St. W., E.M. Watts Rd. to Maple St.	Re-stripe existing pavement to provide bike lanes	$1,500	$1,500	$3,000
31	Maple St. E., Fourth St. E. to Dead End	Add sidewalks and re-stripe with bike lanes	$7,000	$7,000	$14,000
35	Fourth St. E., Oak St. to Columbia Avenue E.	Add sidewalks and re-stripe with bike lanes	$10,500	$10,500	$21,000
	Years 11–20				
65	Scappoose Creek, Dutch Canyon Rd. to Scappoose-Vernonia Hwy.	Construct bike path	$864,000	$216,000	$1,080,000

Fund Projects Paid for and Needed by New Development

New development in the future will contribute funds for improvements to arterial and collector streets through Systems Development Charges (SDCs). The estimate of SDC revenue based on existing rates and growth estimates in the TSP was summarized earlier in this section. Given the growth forecast in the TSP, existing SDC rates, and our assumptions, we estimate SDC revenue will total $1.3 million in the 1996–2015 period (in 1995 dollars); $246,000 in Years 1–5, $297,000 in Years 6–10, and $791,000 in Years 11–20. This is far short of the costs in the TSP for projects that would provide excess capacity to serve traffic generated by new development—$19.3 million. We discuss increasing the city's SDC rates to cover more of this cost later in this section.

The specific projects constructed with SDC revenue will depend on the location of development that generates the SDC revenue—the city will need to construct improvements to serve traffic generated by new development. For example, SDC revenue generated by the recent Fred Meyer development will be used to improve Old Portland Road, which will provide access to the store site.

The city's current SDC methodology is designed so that new development bears the cost of capacity on collector or arterial streets beyond that needed by local traffic.[15] Thus, SDC revenue will contribute only a share of the total cost of improvements to collectors and arterials. SDC revenue can be used for most of the cost of projects that will widen existing arterial or collector streets to serve new development, because these projects would primarily add capacity beyond that needed by local traffic. SDC revenue can be used for only a portion of the cost of projects that will construct new arterial or collector streets, because these new streets would serve local traffic as well as provide excess capacity for non-local traffic. Local funding will be needed to fund the portion of project costs that will provide capacity for local traffic, and for sidewalks which are required on local as well as collector and arterial streets.

The city's current SDC methodology states that property owners or developers should be responsible for funding the cost of the portion of a new arterial or collector needed for local traffic.[16] New construction will provide streets that are needed in order to allow areas of Scappoose to develop—this gives the city leverage to require property owners and developers to fund the local portion of these improvements. In addition, the city's *Land Use and Development Code* appears to require property owners to provide sidewalks as a condition to receive a single-family building permit, unless the Public Works Director determines the construction of a sidewalk is impractical.[17]

The SDC methodology does not state how property owners or developers would be charged to pay for the local portion of new arterial or collector streets; most cities use assessments levied on property by a Local Improvement District or require developers to construct local improvements as a condition of development, including the local portion of collector and arterial streets. For the analysis in this report we assume that the portion of the cost of new construction needed to serve local traffic will be paid for by property owners or developers, or these improvements will not be constructed.

To divide the cost of constructing new collector streets into portions needed for local traffic and excess capacity, we compared the typical cost per mile to construct a residential and major collector street to the design standards in the TSP.[18] The cost of constructing a residential street is 77 percent of the cost of constructing a major collector, so the cost of providing capacity beyond that needed for local traffic is about 23 percent of the cost of constructing

[15] City of Scappoose, Resolution No. 539, Section 1. Adopted August 3, 1992.

[16] City of Scappoose, Resolution No. 539, Section 1. Adopted August 3, 1992.

[17] City of Scappoose, *Land Use and Development Code*, section 17.154.070.

[18] Construction costs per mile from David Evans and Associates, *Regional Transportation Plan, Rogue Valley Metropolitan Planning Organization*, October 1995.

a major collector.[19] To be conservative, we assume SDC funds can be used for 20 percent of the cost of new construction for projects in the TSP that will serve new development.

Using 80 percent of construction cost as the portion of new construction cost needed to provide capacity for local traffic, the total cost of the local portion of new collector streets is about $13.8 million (in 1995 dollars). Most of this cost, $12.4 million, is in the Years 11–20 time period; $492,000 is in Years 1–5 and $938,000 in Years 6–10.

Use remaining Local Funds for the Most Important Projects

Table 25 shows the level of funding from existing sources—ODOT contributions, SDC revenue, property assessments, and local revenue— based on the assumptions and analysis in this section. Property Assessments in Table 25 represent the contribution by property owners or developers for the portion of new construction costs needed to serve local traffic. Other Local Revenue is the level of local funding available for capital expenditures from non-SDC sources, reduced to account for the local matching funds required to receive ODOT contributions for projects (see Table 23). Table 25 sums funding from existing sources, and then compares this to the total cost of projects in the TSP to estimate the level of unfunded project costs.

Table 25 shows the level of local revenue available after providing matching funds for ODOT contributions totals about $334,000 over the twenty year planning period. This local revenue will be needed to fund the costs not covered by SDCs or property assessments for projects that serve new development, and for other high-priority projects in the city. The level of available local funding could be increased if the city decides not to provide matching funds for ODOT contributions; in this case the projects funded by ODOT contributions probably would not be constructed. Table 25 that the level of unfunded project costs is significant, even if the city decided to not provide any matching funds for ODOT contributions. If the City of Scappoose wants to build the projects identified in the TSP, it will need to seek additional funding from local sources. We discuss sources of additional local funding in the next section.

[19] Highway 30 is the only arterial street in Scappoose, and improvements to Highway 30 will be funded by ODOT rather than SDC revenue. Some of the projects in the TSP would construct minor collectors, which would be 2' narrower than a major collector. We do not have information on the typical construction cost of minor collector streets.

TABLE 25
ESTIMATED LEVEL OF FUNDED AND UNFUNDED PROJECTS, BY TIME PERIOD
(1995 DOLLARS)

	Years 1-5	Years 6-10	Years 11-20	Total
ODOT Contributions	$71,150	$22,300	$864,000	$957,450
Local Match	$71,150	$22,300	$216,000	$309,450
SDC Revenue	$246,000	$297,000	$791,000	$1,334,000
Property Assessments	$492,000	$938,000	$12,400,000	$13,830,000
Remaining Local Revenue	$122,850	$175,700	$35,000	$333,550
Total Project Costs Funded From Existing Sources	**$1,003,150**	**$1,455,300**	**$14,306,000**	**$16,764,450**
Total Project Costs	$2,383,300	$7,145,600	$24,760,500	$34,289,400
Unfunded Project Costs	$1,380,150	$5,690,300	$10,454,500	$17,524,950

Increase Systems Development Charges

Many of the projects in the Scappoose TSP would increase capacity by widening existing streets or constructing new streets; this increased capacity is needed to serve new development that is expected to occur during the planning period. The large amount of unfunded projects in Table 25 suggests that SDCs rates for transportation in Scappoose are not high enough to charge for the cost of projects needed to serve new development. As a check, we compared SDC rates for transportation in Scappoose to rates in other jurisdictions in the suburban Portland area. This comparison is shown in Table 26.

TABLE 26
SDC RATES FOR TRANSPORTATION IN SCAPPOOSE AND OTHER JURISDICTIONS FOR SELECTED TYPES OF DEVELOPMENT

Type of New Development	Scappoose	Washington County	Newberg	Wilsonville	Oregon City
Single-Family (per unit)	$347	$1,520	$1,200	$2,190	$1,210
Multi-Family (per unit)	$208	$1,020	$810	$1,560	$800
Retail (per 100,000 sq. ft.)	$178,000	$282,140	$216,950	$428,340	$239,340

Table 26 shows SDC rates in Scappoose are lower than rates in suburban Portland, especially for residential development. It is possible that greater densities and development standards increase the unit cost of transportation capacity. If so, that might explain part of the differences, but for single family and multi-family units, the Scappoose SDC for transportation is on the order of five times less than the SDCs for the other jurisdictions reported in Table 26. Since Oregon law prohibits overcharging new development, the comparable SDCs cannot be too high. The implication in that SDCs in Scappoose recover less than the full costs of the transportation improvements that new development requires. The level of SDCs, however, must be based on a

method that relates the number of trips generated by different land use types to the cost of constructing roadways to accommodate those trips—a city cannot simply set the rate it wants.

We estimated new SDC rates based on the total cost of improvements needed to serve new development in the TSP. Our analysis of new SDC rates is explained in detail in Appendix E. We found that new SDC rates using the project costs in the TSP would be much higher than those of other jurisdictions included in Table 26. Oregon law does not require cities to charge new development for 100 percent of the cost of improvements needed to serve the new development—a city can decide to charge less than 100 percent.

To reduce SDC rates to an acceptable level, we expect that Scappoose will decide that new development should be responsible for only part of the cost of projects needed to serve the new development. As an illustration, we assume that the city will set that percentage so that the SDC rates charged to residential development would be comparable to the low end of the range of rates in the jurisdictions shown in Table 26. The rates that result from 100 percent and 25 percent of total improvement cost are compared to existing rates in Table 27.

TABLE 27
EXISTING SDC RATES AND FUTURE SDC RATES BASED ON TOTAL IMPROVEMENT COSTS IN THE SCAPPOOSE TSP

		New Rates (% of Total Improvement Cost)	
Development Type	**Existing Rates/Unit**	**100%**	**25%**
Residential	**per dwelling unit**	**per dwelling unit**	**per dwelling unit**
Single-family	$347	$5,608	$1,402
Duplex	$347	n/a	n/a
Multi-family	$208	$3,687	$922
Mobile Home	$187	n/a	n/a
Commercial		**per employe**	**per employee**
Theater	$62/seat	n/a	n/a
Retail/Commercial	$1,780/1,000 sq. ft.	$23,487	$5,872
Industrial	$104/employee	$1,773	$443
Professional Offices	$125/employee	$4,098	$1,025
Restaurant	$42/seat	n/a	n/a
Motel	$382/room	n/a	n/a
School	$45/student	$7,046	$1,762
Government	n/a	$8,808	$2,202
Church	$10/seat	n/a	n/a

Source: ECONorthwest, based on methods explained in the text of Appendix B.

Table 28 shows the total revenue that would be generated if the City of Scappoose adopted the SDC rates in the last column of Table 27. Subtracting the revenue from existing SDC rates indicates the additional revenue generated by this increase in SDC rates. We then subtract this additional revenue from the unfunded projects in Table 25 to estimate the level of unfunded projects if the city were to increase SDC rates.

TABLE 28
TOTAL REVENUE FROM INCREASED SDC RATES AND UNFUNDED PROJECT COSTS
AFTER SDC INCREASE (1995 DOLLARS)

	Years 1-5	Years 6-10	Years 11-20	Total
SDC Revenue From Increased Rates	$870,000	$1,050,000	$2,800,000	$4,730,000
– SDC Revenue From Existing Rates	$246,000	$297,000	$791,000	$1,334,000
= Additional SDC Revenue	$624,000	$753,000	$2,009,000	$3,386,000
Unfunded Project Costs After SDC Increase	$756,150	$4,937,300	$8,445,500	$14,138,950

Table 28 shows that increasing SDC rates will still leave substantial unfunded project costs. This suggests that Scappoose will want to seek additional funding sources; we discuss potential sources in the next section.

Seek voter Approval for a Serial levy to Finance Bonds

The City of Scappoose could fund transportation improvements with a property tax levy. A property tax levy would be subject to the Measure 5 of $10 per $1,000 of assessed value for non-school uses if the city were going to use the revenue to fund projects on a pay-as-you-go basis. The Measure 5 limit would not apply if the revenue were used to pay debt service on General Obligation bonds that finance projects. If the city intends to finance transportation projects by issuing bonds, General Obligation bonds would have lower interest and are easier to market than bonds backed by revenue sources other than property taxes. While the city could issue bonds on other revenue sources, such as SDCs, these bonds should also be backed by general obligation property tax authority to reduce the interest and marketing costs. Any bond issue backed by the city's general obligation taxing authority must be approved by city voters.

The combined tax rate (county, city, and other) for most property in the City of Scappoose is $8.79 per $1,000 of assessed value.[20] Therefore, the city can seek a property tax levy of up to $1.21 per $1,000 if the revenue will be used to fund transportation improvements on a pay-as-you-go basis, and there is no limit if the funds will be used to pay for General Obligation bonds. Oregon law limits the amount of bonded debt a city can have at any time to no more than 3 percent of total assessed value in the city. The total assessed value in the City of Scappoose in 1994-95 was $149,276,000,[21] and so the city's statutory debt limit is $4,478,280.[22] The city's debt limit will increase with growth in total assessed value.

Cities typically seek voter approval for serial levies that will produce the payment needed to make payments on the bond issue each year. Since the same total amount of money would be generated each year of the levy, the tax rate needed to generate the bond payment decreases as total assessed value in the city increases.

[20] Oregon Department of Revenue (1995). *Oregon Property Tax Statistics: Fiscal Year 1994–95*, p. 90.
[21] Ibid.
[22] Municipal Debt Advisory Committee and Oregon State Treasurer (1992). *The Oregon Bond Manual*, Appendix D.

For various levels of debt, Table 29 shows the annual revenue needed to support that debt and the tax rate needed to generate that much revenue in the first year of the levy (based on existing assessed values). We assumed that 5 percent of a levy would be uncollectable, and that bonds would be issued for a 20 year term at an annual interest rate of 7 percent, with fees of 3 percent of the value of the issue. Table 29 shows a bond issue of $4.4 million, near the city's statutory debt limit, would require a tax rate of about $3 per $1,000 assessed value in the first year of a levy.

TABLE 29
ANNUAL PAYMENT AND FIRST YEAR TAX RATE FOR VARIOUS LEVELS OF TOTAL DEBT (ROUNDED 1995 DOLLARS)

Total Debt	Annual Payment	Tax Rate/$1,000 Assessed Value
$1,460,000	$142,000	$1.00
$1,760,000	$172,000	**$1.21**
$2,190,000	$213,000	**$1.50**
$2,915,000	$284,000	**$2.00**
$3,640,000	$355,000	$2.50
$4,370,000	$425,000	$3.00

Seek Additional Revenue Sources

A *local option gas tax* would be somewhat tied to the benefits people receive, since those who drive more would pay more, and it would impose some of the cost on non-residents that use local facilities. Local governments in Oregon that have a gas tax include Woodburn, The Dalles, and Washington County. A gas tax would be most appropriately implemented at the county level, because a county-wide election would be necessary for approval whether the tax would be imposed in Scappoose or all of Columbia County, and because the administrative costs would take a larger share of a city gas tax. A county-wide gas tax also makes sense given the county's lack of funding available for transportation and expected population growth. Based on the revenue generated in Woodburn and relative population, each $0.01/gallon tax would generate annual revenue of about $25,000 for Scappoose or $270,000 for Columbia County. If a gas tax were adopted at the county level, we assume revenues would be shared with the city on a proportional basis. Population growth and increased usage of motor vehicles would probably cause revenues from this source to grow at least as fast as inflation in most years, so this revenue source would be relatively stable in inflation-adjusted dollars.

Most local option gas tax proposals in Oregon have been defeated at the polls. Gas taxes are particularly opposed by local gasoline dealers. The Oregon Gasoline Dealers Association, however, has proposed a statewide gas tax increase of $0.01/gallon with revenue dedicated to local jurisdictions. If this proposal is adopted by the Oregon legislature, it would generate about the same revenue as a $0.01/gallon local gas tax.

A *local vehicle registration fee* can be implemented by counties and collected in addition to the state registration fee. This fee would be somewhat tied to benefits received because it would be paid by automobile owners, but it would be collected only from county residents. Based on the number of registered vehicles in Oregon and relative

population, a $10 local vehicle registration fee would generate about $165,000 annually for Columbia County. If this were shared with Scappoose proportionally by population, the city would receive about $15,000 annually. The number of cars in the county will probably grow faster than inflation in most years, so this revenue source would be relatively stable in inflation-adjusted dollars.

A *street utility fee* would charge businesses and residences in Scappoose a fee for use of streets, based on the amount of use typically generated by each type of land use. This fee is similar to those charged for water and sewer utility service, and it would not be subject to the limits of Measure 5. Cities in Oregon that charge a street utility fee include Ashland and Medford, and a typical fee is $2/month for a single-family residence. With about 1,480 residences, a $2/month street utility fee in Scappoose would generate about $35,500 (12 * 2 * 1,480), and the commercial share would generate at least 60 to 100 percent of the residential amount, or about $21,300–$35,500 per year. The total revenue generated per year would be about $56,800–$71,000. The commercial share could be as high as 200 percent of the residential share if the fee is based on ITE trip generation rates. Revenue from this source could only be used for maintenance of streets, but this would free up other funds to use for capital improvements such as the projects in the TSP. Population growth in Scappoose would probably cause the inflation-adjusted level of revenue from a street utility fee to remain stable over time.

Table 30 shows the total funds generated from the revenue sources discussed in this section for the time periods used in the TSP.

TABLE 30
TOTAL FUNDING FROM VARIOUS SOURCES (1995 DOLLARS)

Source	Years 1–5	Years 6–10	Years 11–20	Total
General Obligation Bonds	$4,400,000			$4,400,000
Local Option Gas Tax ($0.01/gallon)	$125,000	$125,000	$250,000	$500,000
Local Vehicle Registration Fee ($10/vehicle)	$75,000	$75,000	$150,000	$300,000
Street Utility Fee ($2/month residential)	$355,000	$355,000	$710,000	$1,420,000
Total Funding From Above Sources	$4,955,000	$555,000	$1,110,000	$6,620,000
Unfunded Project Costs After SDC Increase	$756,150	$4,937,300	$8,445,500	$14,138,950
Remaining Unfunded Projects	($4,198,850)	$4,382,300	$7,335,500	$7,518,950

For purposes of illustration, we have totaled the funding generated by each of the sources in Table 30. It is unlikely, however, that the city will actually implement all of these funding sources because of political opposition to increased taxes. We then subtract this total from the unfunded project costs remaining after an increase in SDC rates. This illustration shows that all of the funding sources would generate surplus revenue of $4.2 million in Years 1-5; if this surplus were carried forward into Years 6-10 there would still be about $200,000 of unfunded projects in that period. Overall, all of these funding sources leave a total of $7.5 million in unfunded project costs.

Delay or Eliminate Projects

Given the large level of unfunded project costs shown in Table 30, it appears that the City of Scappoose will not be able to fund all of the projects in the TSP. Table 30 suggests that the city can fund most of the projects in Years 1-5 and 6-10 if it obtains ODOT contributions, increases SDC rates, and obtains voter approval for a property tax levy. If this occurs, most of the unfunded project costs will be in Years 11-20. Overall, the city will need to be very aggressive in pursuing funding for transportation and very careful to prioritize projects that receive that funding.

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APPENDIX A

SCAPPOOSE STREET SYSTEM INVENTORY

Table A-1
Scappoose Street System Inventory

Street	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	Width avail for Parking	Curbs	Curbs	On-Street Parking	On-Street Parking	Sidewalks	Sidewalks	Bicycle Facilities	Pavement Condition
HWY 30- Columbia River Hwy.													
City Limits (South) to Old Portland Road	35-45	100	75	5	15	West Side	West Side	None	None	West Side	West Side	Bike Lane	Very Good
Old Portland Road to High School Road	35	100	75	5	15	Both Sides	Both Sides	None	None	West Side	West Side	Bike Lane	Very Good
High School Road to Maple Street	20	100	75	5	15	Both Sides	Both Sides	None	None	Both Sides	Both Sides	Bike Lane	Very Good
Maple Street to JP West Road	35	100	75	5	15	Both Sides	Both Sides	None	None	Both Sides	Both Sides	Bike Lane	Very Good
JP West Road to Laurel Street	35	100	83	5	23	Both Sides	Both Sides	West Side	West Side	Both Sides	Both Sides	Bike Lane	Very Good
Laurel Street to Williams Street	35	100	75	5	15	Both Sides	Both Sides	None	None	Both Sides	Both Sides	Bike Lane	Very Good
Williams Street to Vernonia Hwy	35	100	75	5	15	Both Sides	Both Sides	None	None	West Side	West Side	Bike Lane	Very Good
Vernonia Hwy to City Limits (North)	55	100	75	5	15	None	None	None	None	None	None	Bike Lane	Very Good
1st Street NW													
J.P. West Road to E.J. Smith Road	25	50	32	2	8	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
E.J. Smith Road to Wikstrom Drive	25	50	25	2	1	East Side	East Side	East Side	East Side	East Side	East Side	None	Fair
1st Street NE													
Columbia Avenue to Prairie Street	25	50	20	2	4	None	None	None	None	None	None	None	Good
Prairie Street to Williams Street	25	50	20	2	4	None	None	None	Grass/Gravel	None	None	None	Good
Williams Street to Dead End	25	50	20	2	4	None	None	None	None	None	None	None	Good
1st Street SE													
Santosh Street to Myrtle Street	25	30	20	2	4	East Side	East Side	East Side	East Side	East Side	East Side	None	Good
Myrtle Street to Dead End	25	30	20	2	4	East Side	East Side	East Side	East Side	East Side	East Side	None	Good
1st Street SW													
J.P. West Road to Maple Street	25	50	32	2	8	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
2nd Street NE													
East Columbia Avenue to Prairie Street	25	60	40	2	16	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Good
Prairie Street to Williams Street	25	60	31	2	7	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Good
Williams Street to Dead End	25	60	31	2	7	None	None	None	None	None	None	None	Very Poor
2nd Street SE													
East Columbia Avenue to Olive Street	25	60	47	2	23	West Side	West Side	West Side	West Side	Both Sides	Both Sides	Shared	Good
Olive Street to Santosh Street	25	60	22	2	-2	None	None	None	Gravel	Both Sides	Both Sides	None	Good
Santosh to Elm Street	25	60	44	2	20	Both Sides	Both Sides	Both Sides	Both Sides	Partial-W	Partial	Shared	Very Good
J.P. West Road to Dead End	25	50	23	2	1	None	None	None	Gravel	None	None	None	Good
3rd Place SE													
Watts School to Elm Street	25	60	22	2	2	None	None	None	Grass/Gravel	None	None	None	Very Good
3rd Street NE													
East Columbia Avenue to Prairie Street	25	60	34	2	10	East Side	East Side	Both Sides	Both Sides	None	None	None	Good
Prairie Street to Williams Street	25	60	34	2	10	East Side	East Side	Both Sides	Both Sides	West Side	West Side	None	Good
Williams Street to Dead End	25	60	28	2	4	East Side	East Side	Both Sides	Both Sides	Both Sides	Both Sides	None	Fair
3rd Street SE													
East Columbia Avenue to Myrtle Street	25	60	22	2	2	None	None	None	Gravel	None	None	None	Very Good
Myrtle Street to Oak Street	25	60	22	2	2	None	None	None	Gravel	Partial-E	Partial	None	Very Good
Oak Street to Santosh Street	25	60	22	2	2	None	None	None	None	None	None	None	Very Good
Santosh Street to Elm Street	25	60	22	2	2	None	None	None	Gravel	None	None	None	Good
3rd Street SW													
J.P. West Road to Maple Street	25	50	20	2	4	None	None	None	Gravel	None	None	None	Poor

Table A-1
Scappoose Street System Inventory

Street	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	Width avail for Parking	Curbs	Curbs	On-Street Parking	On-Street Parking	Sidewalks	Sidewalks	Bicycle Facilities	Pavement Condition
4th Street NW													
Smith Street to Dead End	25	60	20	2	-4	East Side	East Side	None	None	East Side	East Side	None	Fair
4th Street SE													
Elm Street to Rose Lane	25	50	20	2	-4	None	None	None	Grass/Gravel	None	None	None	Good
East Columbia Avenue to Oak Street	25	60	44	2	20	Both Sides	Both Sides	Both Sides	Both Sides	None	None	Shared	Fair
Oak Street to Maple Street	25	50	36	2	12	None	None	Both Sides	Both Sides	None	None	None	Fair
Maple Street to Santosh Street	25	50	35	2	11	None	None	Both Sides	Both Sides	None	None	None	Fair
Santosh Street to Elm Street	25	50	34	2	10	None	None	Both Sides	Both Sides	None	None	None	Good
4th Street SW													
J.P. West Road to Day Street	25	40-50	20	2	-4	None	None	None	None	None	None	None	Very Good
Day Street to Maple Street	25	40	20	2	-4	None	None	None	Gravel	None	None	None	Very Good
Maple Street to Julie Court	25	40	44	2	20	Partial	Partial	West Side	West Side	None	None	None	Good
Julie Court to E.M. Watts Road	25	40	44	2	20	None	None	West Side	West Side	West Side	West Side	None	Good
E.M. Watts Road to Rogers Way	25	60	42	2	18	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Good
Rogers Way to Meadows Drive	25	40	42	2	18	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
Meadows Drive to Park Drive	25	40	42	2	18	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
5th Street NE													
East Columbia Avenue to Prairie Street	25	60	20	2	-4	None	None	None	Gravel	None	None	None	Very Good
5th Street NW													
E.J. Smith Road to Wheeler Street	25	60	30	2	6	None	None	None	Gravel	None	None	None	Very Poor
5th Street SE													
High School Way to Vine Street	25	60	25	2	1	None	None	None	Grass	None	None	None	Good
Vine Street to Rose Lane	25	60	30	2	6	None	None	None	Grass	None	None	None	Good
Rose Lane to Elm Street	25	60	25	2	1	None	None	None	Grass/Gravel	None	None	None	Good
6th Street NW													
E.J. Smith Road to Wheeler Street	25	60	30	2	6	None	None	None	Grass/Gravel	None	None	None	Poor
6th Street SE													
Springlake Park to High School Way	25	60	20	2	-4	None	None	None	None	West Side	West Side	None	Good
High School Way to Vine Street/CURVE	25	60	44	2	20	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
Vine Street/CURVE to Terri Way	25	40	24	2	0	West Side	West Side	West Side	West Side	West Side	West Side	None	Very Good
South End of Improved to Terri Way	25	50	26	2	2	West Side	West Side	West Side	West Side	None	None	None	Good
Terri Way to Patricia Way	25	60	30	2	6	West Side	West Side	West Side	West Side	None	None	None	Poor
Patricia Way to Elm Street	25	55	30	2	6	West Side	West Side	West Side	West Side	None	None	None	Poor
7th Street NW													
E.J. Smith Road to Wheeler Street	25	60	30	2	6	None	None	None	Grass/Gravel	None	None	None	Poor
11th Street NW													
Bella Vista Drive to Sunset Drive	25	60	36	2	12	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Very Good
Bella Vista Drive to Dead End	25	50	36	2	12	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Very Poor
12th Street NW					0								
Bella Vista Drive to Dead End	25	25	20	2	-4	Both Sides	Both Sides	None	None	None	None	None	Good
13th Street NW													
Bella Vista Drive to Dead End	25	25	20	2	-4	Both Sides	Both Sides	None	None	None	None	None	Good

Table A-1
Scappoose Street System Inventory

Street	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	Width avail for Parking	Curbs	Curbs	On-Street Parking	On-Street Parking	Sidewalks	Sidewalks	Bicycle Facilities	Pavement Condition
14th Street NW													
Bella Vista Drive to Sunset Drive	25	25	36	2	12	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
Bella Vista Road NW													
E.J. Smith Road to 11th Street	25	60	36	2	12	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Very Good
11th Street to 14th Street	25	60	36	2	12	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
14th Street to Dead End	25	60	36	2	12	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
Bonnie Lane	25	50	N/A	2			None	None	None	None	None	None	Poor
Callahan Road SW													
Portland Road to City Limits	25	40	19	2	-5	None	None	None	None	None	None	None	Very Good
Cliff Drive NW													
Ridge Drive to Peak Road	25	50	33	2	9	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
Columbia Avenue NW													
Hwy 30 to 1st Street	25	40	28	2	4	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Poor
Cypress Court SE													
Maple Street to Dead End	25	50	34	2	10	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
Day Street SW													
4th Street to Dead End	25	50	23	2	-1	None	None	None	Gravel-N	None	None	None	Very Good
Dutch Canyon Road SW													
Old Portland Road to E.M. Watts Road	25	40	20	2	-4	None	None	None	None	None	None	None	Good
Old Portland Road to Hwy 30	25	40	25	2	1	None	None	None	None	None	None	None	Very Poor
East Columbia Avenue SE													
Hwy 30 to 1st Street	25	40	38	2	14	Both Sides	Both Sides	None	None	Both Sides	Both Sides	None	Fair
1st Street to 2nd Street	25	40	38	2	14	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Good
2nd Street to 3rd Street	25	40	40	2	16	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Good
3rd Street to Sawyer Street	25	40	30	2	6	Partial-S	Partial	Both Sides	Both Sides	Partial-S	Partial	None	Good
Sawyer Street to West Lane Road	25	40	30	2	6	Partial-N	Partial	Both Sides	Both Sides	Partial-N	Partial	None	Good
West Lane Road to North Road	25	60	20	2	-4	None	None	None	Gravel	None	None	None	Fair
E.J. Smith Road NW													
1st Street to 4th Street	25	40-50	23	2	-1	None	None	None	None	None	None	None	Good
4th Street to 5th Street	25	40	23	2	-1	None	None	None	None	None	None	None	Good
5th Street to 7th Street	25	50	23	2	-1	None	None	None	None	None	None	None	Poor
7th Street to Peak Road	25	40	23	2	-1	None	None	None	None	None	None	None	Poor
Peak Road to Sandberg Road	25	40	23	2	-1	None	None	None	None	None	None	None	Good
Sandberg Road to City Limits	25	40	23	2	-1	None	None	None	None	None	None	None	Poor
E.M. Watts Road NW													
Hwy 30 to First Street	25	40	28	2	4	Both Sides	Both Sides	None	None	Both Sides	Both Sides	None	Good
E.M. Watts Road SW													
Hwy 30 to 4th Street	20	40	20	2	-4	Partial-S	Partial	None	None	South Side	South Side	Bike Lane	Good
4th Street to Keys Road	25	40	20	2	-4	None	None	None	None	None	None	None	Fair
Keys Road to City Limits	25	40	20	2	-4	None	None	None	None	None	None	None	Good
City Limits to Dutch Canyon Road	45	40	20	2	-4	None	None	None	None	None	None	None	Good

Table A-1
Scappoose Street System Inventory

Street	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	Width avail for Parking	Curbs	Curbs	On-Street Parking	On-Street Parking	Sidewalks	Sidewalks	Bicycle Facilities	Pavement Condition
Eastview Drive NW													
J.P. West Road to Dead End	25	43	20	2	-4	None	None	None	Gravel-E	None	None	None	Poor
Eggleston Lane SW													
E.M. Watts Road to Dead End (North)	25	40	18	2	-6	None	None	None	None	None	None	None	Very Poor
Elm Street SE													
RR Tracks to 3rd Street (North)	25	40	22	2	-2	None	None	None	Grass/Gravel	None	None	None	Poor
3rd Street to 3rd Place	25	40	22	2	-2	None	None	None	Gravel	None	None	None	Fair
3rd Place to 4th Street	25	40	22	2	-2	None	None	None	Gravel	None	None	None	Fair
4th Street to 5th Street	25	40	22	2	-2	None	None	None	Gravel	None	None	None	Fair
5th Street to 6th Street	25	40	22	2	-2	Partial-S	Partial	None	Gravel	None	None	None	Poor
Evergreen Way SW													
4th Street to Dead End (West)	25	50	34	2	10	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Good
Five Peaks Terrace NW													
Peak Road to Overlook Street	25	50	25	2	1	None	None	East Side	East Side	None	None	None	Fair
Overlook Street to Dead End	25	60	34	2	10	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
Hall Street NW													
Hwy 30 to 1st Street	25	50	28	2	4	None	None	None	None	Both Sides	Both Sides	None	Very Poor
High School Way SE													
Hwy 30 to 6th Street	25	N/A	41	2	17	None	None	None	None	None	None	None	Very Good
Hill Terrace SW													
Keys Road to Dead End (South)	25	N/A	18	2	-6	None	None	None	None	None	None	None	Very Poor
Ironwood Court SE													
Maple Street to Dead End (South)	25	50	34	2	10	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
J.P. West Road SW													
Hwy 30 to 1st Street	25	40	25	2	1	None	None	None	None	None	None	None	Very Good
1st Street to 2nd Street	25	40	25	2	1	Both Sides	Both Sides	None	Nonerth	Both Sides	Both Sides	None	Very Good
2nd Street to City Limits	25	40	20	2	-4	None	None	None	None	None	None	None	Very Good
Jobin Lane	25	50	N/A	2			None	None			None	None	Poor
Julie Court SW													
4th Street to Dead End (West)	25	50	33	2	9	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
Karen Place NE													
Sawyer Street to Dead End	25	50	32	2	8	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Fair
Keys Road SW													
J.P. West to Bonnie Lane	25	40-50	20	2	-4	None	None	None	None	None	None	None	Fair
Bonnie Lane to E.M. Watts Road	25	50	20	2	-4	None	None	None	None	None	None	None	Good
Laurel Street NE													
1st Street to 2nd Street	25	60	28	2	4	Partial	Partial	Both Sides	Both Sides	None	None	None	Good
2nd Street to 3rd Street	25	60	32	2	8	None	None	Both Sides	Both Sides	South Side	South Side	None	Very Good
Laurel Street NW													
Hwy 30 to 1st Street	25	46	26	2	2	Both Sides	Both Sides	None	None	Both Sides	Both Sides	None	Good

Table A-1
Scappoose Street System Inventory

Street	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	Width avail for Parking	Curbs	Curbs	On-Street Parking	On-Street Parking	Sidewalks	Sidewalks	Bicycle Facilities	Pavement Condition
Maple Street SE													
Hwy 30 to 1st Street	25	60	22	2	-2	None	None	None	None	Both Sides	Both Sides	None	Fair
1st Street to 2nd Street	25	60	22	2	-2	None	None	None	Grass	None	None	None	Very Good
2nd Street to 3rd Street	25	60	24	2	0	None	None	None	Gravel	None	None	None	Very Good
3rd Street to 4th Street	25	60	24	2	0	None	None	None	Gravel	None	None	None	Good
4th Street to Dead End	25	60	44	2	20	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
Maple Street SW													
Hwy 30 to 1st Street	20	60	37	2	13	None	None	None	Nonerth	None	None	None	Very Good
1st Street to 3rd Street	20	60	26	2	2	None	None	None	Gravel	None	None	None	Very Good
3rd Street to 4th Street	20	60	26	2	7	None	None	None	Gravel	None	None	None	Good
4th Street to Dead End	25	60	32	2	8	South Side	South Side	Both Sides	Both Sides	None	None	None	Fair
Meadow Drive SW													
Creekview to 4th Street	25	50	42	2	18	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
4th Street to Dead End	25	50	35	2	11	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
Mountain Way SW													
4th Street to Dead End (East)	25	50	28	2	4	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Good
Myrtle Street SE													
1st Street to 2nd Street	25	60	32	2	8	Partial -S	Partial	South Side	South Side	None	None	None	Very Good
2nd Street to 3rd Street	25	60	28	2	4	None	None	None	Gravel	None	None	None	Very Good
3rd Street to 4th Street	25	60	32	2	8	None	None	Both Sides	Both Sides	None	None	None	Good
4th Street to Dead End	25	60	44	2	20	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Fair
Oak Street SE													
1st Street to 2nd Street	25	44	20	2	-4	None	None	None	None	None	None	None	Very Good
2nd Street to 3rd Street	25	44	19	2	-5	None	None	None	None	None	None	None	Very Good
3rd Street to 4th Street	25	55	20	2	-4	None	None	None	Gravel	None	None	None	Very Good
4th Street to Dead End	25	55	23	2	-1	South Side	South Side	South Side	South Side	None	None	None	Very Good
Old Portland Road SW													
Hwy 30 to Dutch Canyon Road	45	60	20	2	-4	Partial	Partial	None	Grass/Gravel	Partial	Partial	None	Fair
Dutch Canyon Road to Callahan Road	45	60	20	2	-4	None	None	None	Grass/Gravel	None	None	None	Fair
Callahan Road to City Limits	45	60	20	2	-4	None	None	None	Grass/Gravel	None	None	None	Fair
Olepha Drive NW													
Vernonia Hwy to Dead End	25	50	35	2	11	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Very Good
Olive Street SE													
2nd Street to 3rd Street	25	55	30	2	6	None	None	Both Sides	Both Sides	None	None	None	Very Good
3rd Street to Dead End	25	55	30	2	6	None	None	Both Sides	Both Sides	None	None	None	Fair
Overlook Street NW													
Five Peak Terrace to View Terrace	25	50	20	2	-4	South Side	South Side	None	None	South Side	South Side	None	Very Good
Patricia Way SE													
6th Street to Dead End	25	50	34	2	10	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Fair
Peak Road NW													
Five Peaks Terrace to View Terrace Place	25	50	33	2	9	None	None	Both Sides	Both Sides	None	None	None	Very Poor
View Terrace Place to E.J. Smith Road	25	50	33	2	9	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Very Good

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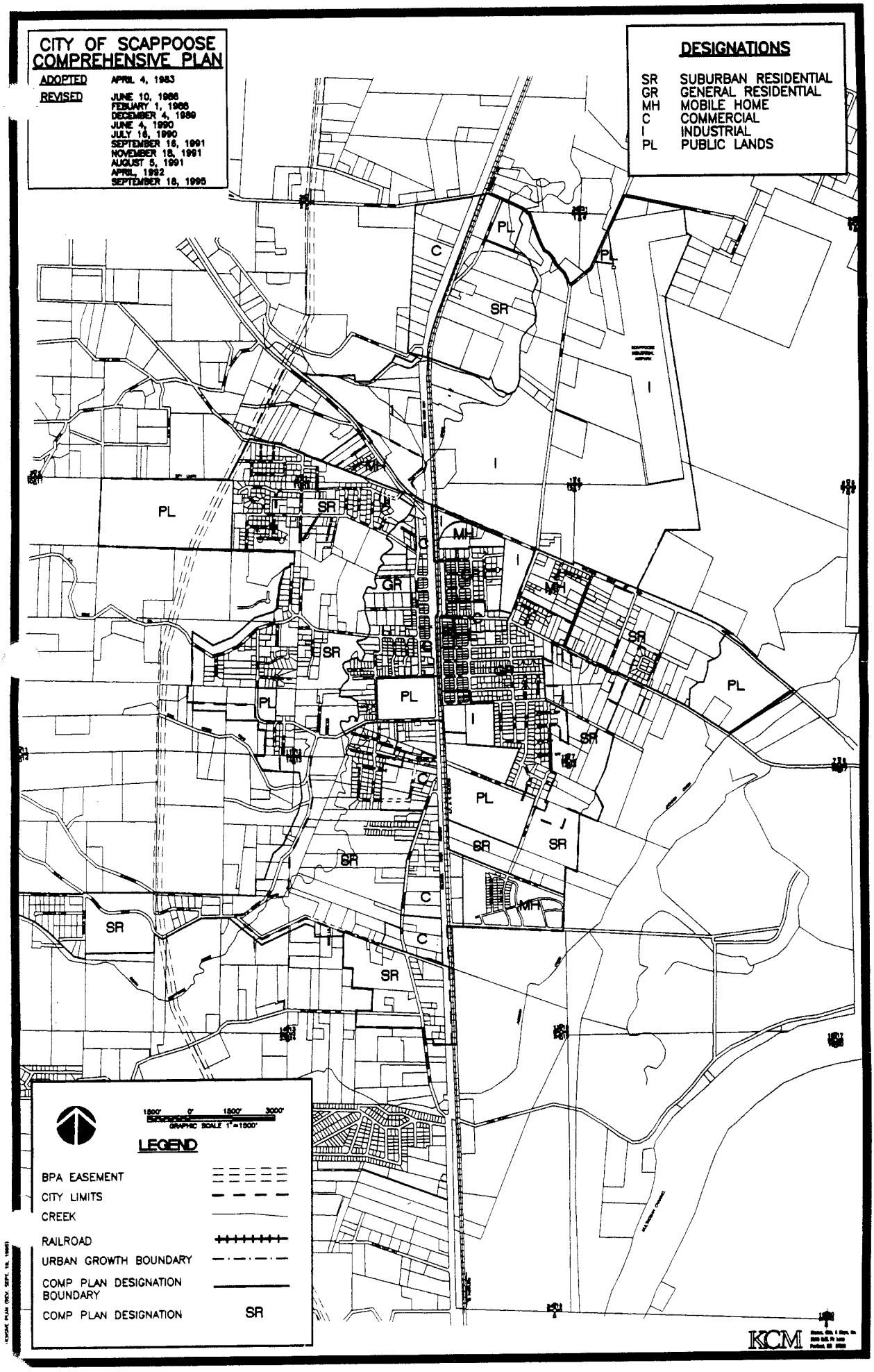
Street	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	Width avail for Parking	Curbs	Curbs	On-Street Parking	On-Street Parking	Sidewalks	Sidewalks	Bicycle Facilities	Pavement Condition
Prairie Street NE													
1st Street to 2nd Street	25	60	22	2	-2	None	None	None	Gravel	None	None	None	Good
2nd Street to 3rd Street	25	60	21	2	-3	None	None	None	Gravel	None	None	None	Very Good
3rd Street to 4th Street	25	60	42	2	18	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
West Lane Road to Dead End	25	60	21	2	-3	None	None	None	Gravel	None	None	None	Very Good
Prairie Street NW													
Hwy 30 to 1st Street	25	60	28	2	4	Both Sides	Both Sides	None	None	Both Sides	Both Sides	None	Good
Ridge Drive NW													
E.J. Smith Road to Rose Street	25	60	31	2	7	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Fair
Rose Street to Dead End	25	50	31	2	7	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
Rogers Road SW													
4th Street to Dead End (East)	25	50	42	2	18	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Good
Rogers Way SW													
4th Street to Dead End (West)	25	50	42	2	18	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Good
Rose Court NW													
Ridge Drive to Dead End	25	50	32	2	8	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
Rose Lane SE													
3rd Street to 5th Street	25	60	22	2	-2	None	None	None	Grass/Gravel	None	None	None	Good
Sandberg Road NW													
E.J. Smith Road to E. J. Smith Road	25	60	20	2	-4	None	None	None	None	None	None	None	Good
Santosh Street SE													
Hwy 30 to 1st Street	25	60	22	2	-2	Both Sides	Both Sides	None	None	Both Sides	Both Sides	None	Fair
1st Street to 4th Street	25	60	22	2	-2	None	None	None	Gravel	None	None	None	Very Good
Sawyer Street NE													
East Columbia Avenue to Williams Street	25	60	42	2	18	Both Sides	Both Sides	Both Sides	Both Sides	East Side	East Side	None	Fair
Sunset Drive NW													
11th Street to 14th Street	25	60	35	2	11	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Very Good
Terri Way SE													
6th Street to Dead End	25	50	34	2	10	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
Vernonia Hwy NW													
Hwy 30 to City Limits	45	60	30	2	6	None	None	None	None	None	None	None	Fair
View Terrace NW													
View Terrace to Overlook Drive	25	60	34	2	10	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
Overlook Drive to Peak Road	25	60	34	2	10	None	None	East Side	East Side	None	None	None	Very Good
Vine Street SE													
Watts School to 5th Street	25	50	20	2	-4	None	None	None	Gravel-S	None	None	None	Very Good
5th Street to Woodmere Court	25	50	20	2	-4	None	None	None	Grass/Gravel	None	None	None	Very Good
Woodmere Court to 6th Street	25	50	22	2	-2	None	None	None	Grass/Gravel	None	None	None	Very Good
Walnut Street SW													
Hwy 30 to Dead End (West)	25	60	42	2	18	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Very Good

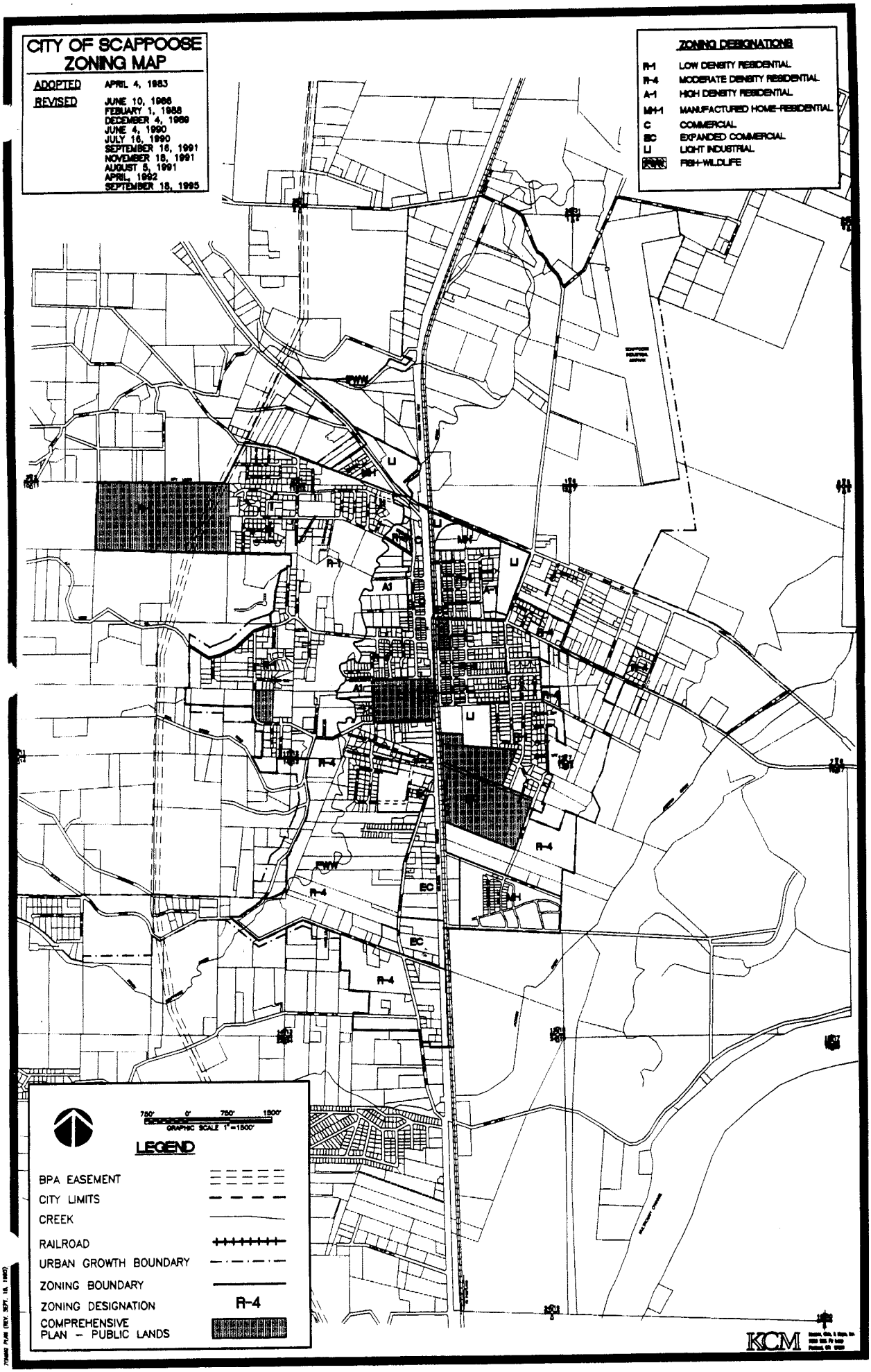
Table A-1
Scappoose Street System Inventory

Street	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	No. of Travel Lanes	Width avail for Parking	Curbs	Curbs	On-Street Parking	On-Street Parking	Sidewalks	Sidewalks	Bicycle Facilities	Pavement Condition
Watts Street NE													
1st Street to 3rd Street	25	60	26	2	2	None	None	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
West Lane Road NE													
East Columbia Avenue to Prairie Street	25	40	20	2	-4	None	None	None	Gravel-E	None	None	None	Good
Wheeler Road NW													
Dead End to 7th Street	25	60	20	2	-4	None	None	None	None	None	None	None	Very Poor
7th Street to 6th Street	25	60	30	2	6	None	None	None	Gravel	None	None	None	Poor
6th Street to 5th Street	25	60	30	2	6	None	None	None	None	None	None	None	Fair
5th Street to Vernonia Hwy	25	60	24	2	0	None	None	None	None	None	None	None	Very Poor
Wickstrom NW													
1st Street to Dead End	25	50	18	2	-6	None	None	None	Grass	None	None	None	Very Good
Williams Street NE													
Hwy 30 to 1st Street	25	60	24	2	0	None	None	None	Gravel	None	None	None	Good
1st Street to 2nd Street	25	60	24	2	0	None	None	None	Gravel	Both Sides	Both Sides	None	Good
2nd Street to 3rd Street	25	60	22	2	-2	None	None	None	Gravel	Both Sides	Both Sides	None	Good
3rd Street to Sawyer Street	25	60	44	2	20	Both Sides	Both Sides	Both Sides	Both Sides	None	None	None	Good
Sawyer Street to Dead End	25	60	24	2	0	Both Sides	Both Sides	None	Both Sides	South Side	South Side	None	Fair
Woodmere Court SE													
Vine Street to Dead End	25	50	28	2	4	None	None	Both Sides	Both Sides	None	None	None	Good
Fayway SE													
6th Street to Dead End	25	50	34	2	10	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
Everett Way SE													
6th Street to Dead End	25	50	34	2	10	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
Brookshire Court SW													
4th Street to Dead End	25	N/A	20	2	-4	Both Sides	Both Sides	None	None	None	None	None	Fair
Creekview Place SW													
4th Street to Meadows Drive	25	50	42	2	18	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good
View Terrace Place													
Dead End to Dead End	25	60	34	2	10	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	Both Sides	None	Very Good

APPENDIX B

COMPREHENSIVE PLAN MAP
ZONING MAP AND
TRAFFIC ANALYSIS ZONE (TAZ) MAP


CITY OF SCAPPOOSE
COMPREHENSIVE PLAN
ADOPTED APRIL 4, 1983
REVISED JUNE 10, 1986
FEBUARY 1, 1988
DECEMBER 4, 1989
JUNE 4, 1990
JULY 16, 1990
SEPTEMBER 16, 1991
NOVEMBER 18, 1991
AUGUST 5, 1991
APRIL 1992
SEPTEMBER 18, 1995
DESIGNATIONS
SR SUBURBAN RESIDENTIAL
GR GENERAL RESIDENTIAL
MH MOBILE HOME
C COMMERCIAL
I INDUSTRIAL
PL PUBLIC LANDS
1500' 0' 1500' 3000'
GRAPHIC SCALE 1" = 1500'
LEGEND
BPA EASEMENT
CITY LIMITS
CREEK
RAILROAD
URBAN GROWTH BOUNDARY
COMP PLAN DESIGNATION BOUNDARY
COMP PLAN DESIGNATION
SR
KCM


CITY OF SCAPPOOSE
ZONING MAP
ADOPTED APRIL 4, 1983
REVISED JUNE 10, 1986
FEBUARY 1, 1988
DECEMBER 4, 1989
JUNE 4, 1990
JULY 16, 1990
SEPTEMBER 16, 1991
NOVEMBER 18, 1991
AUGUST 5, 1991
APRIL, 1992
SEPTEMBER 18, 1995
ZONING DESIGNATIONS
R-1 LOW DENSITY RESIDENTIAL
R-4 MODERATE DENSITY RESIDENTIAL
A-1 HIGH DENSITY RESIDENTIAL
MH-1 MANUFACTURED HOME-RESIDENTIAL
C COMMERCIAL
EC EXPANDED COMMERCIAL
LI LIGHT INDUSTRIAL
FWW FISH-WILDLIFE
750' 0' 750' 1500'
REFERENCE
GRAPHIC SCALE 1" =1500'
LEGEND
BPA EASEMENT
CITY LIMITS
CREEK
RAILROAD
URBAN GROWTH BOUNDARY
ZONING BOUNDARY
ZONING DESIGNATION R-4
COMPREHENSIVE PLAN – PUBLIC LANDS
KCM

APPENDIX C

LAND USE FORECAST

City of Scappoose

Transportation System Plan

Demographic Forecast

Prepared for

City of Scappoose, Oregon

September 8, 1995

TABLE OF CONTENTS

LIST OF TABLES

I. INTRODUCTION

This report summarizes the methods and assumptions used by David Evans and Associates, Inc. (DEA) to estimate current population, housing, and employment in Scappoose, Oregon, and to forecast these demographics for the year 2015. The demographic data, presented in Tables 1, 2, and 3, were prepared for use in a computer transportation model, TModel 2, which uses housing, employment, and transportation data to determine future transportation needs. Identified needs then will be utilized to prepare the City of Scappoose's Transportation System Plan (TSP).

II. STUDY AREA

The study area for the TSP is defined by the City's Urban Growth Boundary (UGB) and is shown on Figures 1 and 2 included with this report. Because the study area boundary differs from the Scappoose city limits, the demographic data contained in this report should not be compared directly with existing data for the city, nor should the projections be used in other studies associated with the city limits.

III. BASE CASE ESTIMATES AND METHODOLOGY

To begin the demographic work, DEA divided the study area into 24 TAZs. Dividing the area into zones enables the computer model to analyze traffic movements between localized areas. TAZ boundaries typically are based on land use, major streets, topography, natural constraints, and US Census blocks. All population and employment estimates for existing (base case) and forecast conditions are divided according to the appropriate TAZs to enable the computer to track demographic change for different portions of the city.

Population and Housing

DEA's calculations result in an estimated 1995 population of 4,478 for the study area. The number of dwelling units in the study area is estimated at 1,706, of which 1,318 (77 percent) are single-family homes and 388 (23 percent) are multi-family units. For the purposes of this study, mobile homes were counted as multi-family units because they typically have a household size similar to that of multi-family units, that is, fewer people live in the typical mobile home or apartment than live in a single-family dwelling. A smaller household is assumed to generate fewer vehicle trips. Estimated 1995 population and housing figures are presented in Table 1 and are also shown on Figure 1.

Table 1
Existing and Projected Housing and Population
Scappoose Study Area

	1990				1995 estimate				2015 forecast			
TAZ	Total du	SF du	MF du	Pop.	Total du	SF du	MF du	Pop.	Total du	SF du	MF du	Pop.
1	4	4	0	9	4	4	0	9	4	4	0	10
2	13	13	0	29	13	13	0	30	37	37	0	93
3	14	14	0	37	14	14	0	38	14	14	0	36
4	8	8	0	19	8	8	0	19	8	8	0	21
5	4	4	0	14	4	4	0	14	4	4	0	10
6	0	0	0	0	0	0	0	0	0	0	0	0
7	109	103	6	318	112	106	6	326	207	162	45	518
8	15	13	2	35	15	13	2	36	15	13	2	38
9	99	97	2	305	101	99	2	313	176	174	2	441
10	49	31	18	117	71	32	39	164	127	66	62	319
11	162	85	77	402	166	87	79	412	185	98	86	462
12	70	65	5	191	72	67	5	196	327	247	80	817
13	49	24	25	130	50	25	25	133	187	162	25	468
14	78	50	28	177	80	50	30	181	299	269	30	748
15	247	202	45	667	253	207	46	684	288	228	60	720
16	43	43	0	122	44	44	0	125	74	74	0	185
17	145	92	53	358	149	94	54	367	163	103	60	407
18	92	92	0	249	94	94	0	255	214	214	0	536
19	24	24	0	62	25	25	0	62	70	70	0	174
20	125	115	10	353	128	118	10	362	294	284	10	735
21	136	113	23	370	139	116	24	379	185	161	24	461
22	68	68	0	171	70	70	0	175	115	115	0	287
23	3	3	0	5	68	3	65	143	237	3	234	593
24	23	23	0	52	24	24	0	53	24	24	0	60
Total	1,580	1,286	294	4,192	1,706	1,318	388	4,478	3,255	2,535	720	8,138

du = dwelling unit Pop. = population
SF = single-family MF = multi-family

9/8/95

To estimate current population and housing, DEA relied upon 1990 US Census data at the census block level. Census blocks, the smallest division of census data, contain information on population, race, age, dwelling units, etc. Block data were aggregated into study area TAZs to get the 1990 demographic information for each TAZ and the total study area.

Actual population counts for specific census blocks are available only for every 10-year US Census. Therefore, it was necessary to estimate existing (1995) population for each TAZ in the study area. DEA calculated a short-term average annual growth rate of 0.98 percent using 1990 census population for the City of Scappoose and the estimated 1994 city population from the Center for Population Research and Census at Portland State University (PSU). However, a slightly higher rate was used for this study based on information obtained from the City of Scappoose.

DEA assumed that residential infill has occurred throughout the study area, with some TAZs experiencing more growth than others in the past five years. The City planning department was contacted in order to identify specific areas that have received notable development since 1990. A relatively new mobile home development in TAZ 23 and other new development in TAZ 10 are known to have added approximately 86 new housing units that did not appear in the 1990 US Census. Just by adding these units, and assuming relatively slow annual growth in the rest of the city (0.5 percent) the average annual growth rate from 1990 to 1995 is 1.3 percent.

The number of single- and multi-family dwelling units was determined by calculating the 1990 proportions of single- and multi-family units in each TAZ, then applying the proportions to the 1995 estimated total dwelling units in each. Adjustments were made according to City information.

Employment

According to DEA's estimates, Scappoose currently has an average of 893 non-agricultural jobs in the TSP study area. Employment estimates by type of work are shown in Table 2, and total employment in each TAZ is shown on Figure 1.

Most available employment statistics are for Columbia County as a whole rather than for the City of Scappoose. In addition, because employment data needed to be specific to the study area for computer analysis, it was necessary to estimate employment located in each TAZ. Therefore, DEA obtained employment information through a field survey, document research, and telephone interviews. Sources included The City of Scappoose, The St. Helens/Scappoose Chamber of Commerce, the Oregon Employment Department, and various businesses and agencies located in the study area.

Table 2
1995 Employment Estimates
Scappoose Study Area

TAZ	Total	Commercial	Office	Industrial	Medical	Government	School	Students
1	34	7	0	5	0	0	22	
2	0	0	0	0	0	0	0	
3	64	8	0	55	0	0	1	10
4	26	0	0	26	0	0	0	
5	6	5	0	1	0	0	0	
6	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	
8	5	0	0	0	0	5	0	
9	38	0	0	38	0	0	0	
10	63	45	3	0	2	13	0	
11	95	53	0	30	12	0	0	
12	1	1	0	0	0	0	0	
13	10	0	0	0	0	10	0	
14	0	0	0	0	0	0	0	
15	137	8	1	60	50	18	0	
16	0	0	0	0	0	0	0	
17	125	37	2	2	4	0	80	797
18	0	0	0	0	0	0	0	
19	0	0	0	0	0	0	0	
20	117	110	7	0	0	0	0	
21	172	0	17	60	0	0	95	1,000
22	0	0	0	0	0	0	0	
23	6	5	1	0	0	0	0	
24	64	38	17	8	1	0	0	
Total	893	274	30	277	68	46	198	1,807

Total Employment within Study Area = 893

The 1995 population-to-employment ratio in the study area is 5.0 to 1, which is higher than average. In most urban areas, the ratio usually falls between 2.1 and 3.0. Lower ratios occur where almost all employment is contained within an urban area and is based primarily in manufacturing, commercial, and service industries. Higher ratios occur where many jobs in an area are resource-based, e.g., in agriculture, forestry, mineral extraction, etc.; where a large number of employees commute to work in other areas; or where unemployment is high. Many residents of Scappoose commute to jobs outside of the city. The City's Comprehensive Plan reports that, in 1989, only 29 percent of the resident work force actually worked in Scappoose, the remainder commuted to out-of-town jobs. The high percentage of commuters explains the study area's high population-to-employment ratio.

IV. FORECAST

Population and Housing

Population and housing counts were forecast to the year 2015 to meet the 20-year planning outlook of the TSP. DEA used an average annual growth rate of approximately 3 percent to calculate the 2015 population of the study area. This growth rate is the average of the 20- and 25-year historic growth rates based on census counts for the city and PSU's 1994 population estimate. The projected 2015 population for the study area is 8,138. Table 1 and Figure 2 indicate projected population for each TAZ in the study area.

Population and housing growth will be concentrated in the TAZs most able to accommodate it. Many TAZs in the study area are largely developed and will accommodate only infill or replacement units. Some TAZs, however, contain substantial amounts of vacant buildable land designated for residential use and can accommodate the majority of Scappoose's expected growth. Vacant land was estimated based on information contained in the City's Comprehensive Plan and from discussions with the City planning department. The City also identified areas more likely to be developed than others; these areas were assumed to be developed before others.

The amount and type (single- or multi-family) of residential development in each TAZ was estimated based on Comprehensive Plan designations and the City's information. Land designated for Suburban Residential development was assumed to develop at a density of approximately 4 dwelling units per net acre (du/acre). Land designated for mobile home development is expected to develop at approximately 4.5 units per net acre because land under this designation typically develops with a mix of single-family and mobile home units. General Residential land was assumed to develop with both single- and multi-family units, with the majority (75 percent) being single-family and the remainder multi-family. Because this land is closer to the city's center, higher densities, comparable to existing development, were used to project future development. On vacant General Residential land, single-family was assumed to develop at 5 units per acre and multi-family at 10 units per acre.

Additional dwelling units were added to 1995 estimated dwelling units to determine 2015 totals. Under these assumptions, the study area would contain a total of 3,255 dwelling units. Of these, 2,535 (78 percent) would be single-family dwellings, and 720 (22 percent) would be multi-family dwelling units.

It is important to note that the buildable residential acreage is estimated. An accurate inventory of buildable lands was not available at the time of this study.

As mentioned above, future population for the entire study area was calculated using the long-term average annual growth rate of 3 percent. However, each TAZ will accommodate a different amount of growth. Population for each TAZ was calculated by multiplying the projected number of dwelling units by an average household size. According to the 1990 census data, average household size in the study area was 2.65. In general, the number of persons per household is decreasing in the United States. Therefore, DEA assumed a slightly smaller household size of 2.5 persons for the 2015 projections.

Table 1 indicates the number of housing units and population projected for each TAZ. The forecast shows some TAZs containing fewer people than they currently contain. This is a result of smaller household size.

Employment

The employment forecast for the TSP is not intended to be a full-sector (agricultural and non-agricultural) forecast. The projections do not include agricultural jobs because the TSP is for facilities and improvements within the study area, and agricultural-related trips have only minor impacts on traffic patterns in the study area. The projected 2015 employment for the study area is 1,746. Employment projections for each TAZ are shown in Table 3 and on Figure 2.

Future employment is based on several assumptions. Demand for medical, school, and government services depends largely on changes in population. It was assumed that most medical and school employment would increase at approximately the same rate as population--a total of 80 percent over the next 20 years. Government employment will likely increase at a slightly lesser rate if current "government efficiency" concerns continue. Therefore, government jobs were assumed to increase by 70 percent overall.

Commercial, office, and industrial employment was assumed to increase by 20 percent in TAZs that are already developed and contain little or no vacant land. The additional employment would occur through redevelopment and infill.

Table 3
2015 Projected Employment
Scappoose Study Area

TAZ	Total	Commercial	Office	Industrial	Medical	Government	School	Students
1	77	36	0	6	0	0	35	0
2	0	0	0	0	0	0	0	0
3	136	10	0	125	0	0	2	20
4	31	0	0	31	0	0	0	0
5	106	6	0	100	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	33	19	5	0	0	9	0	0
9	46	0	0	46	0	0	0	0
10	83	54	4	0	4	22	0	0
11	135	64	0	50	22	0	0	0
12	1	1	0	0	0	0	0	0
13	17	0	0	0	0	17	0	0
14	0	0	0	0	0	0	0	0
15	203	10	1	72	90	31	0	0
16	0	0	0	0	0	0	0	0
17	196	44	2	2	7	0	140	1,380
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	140	132	8	0	0	0	0	0
21	235	0	20	40	0	0	175	1,850
22	0	0	0	0	0	0	0	0
23	7	6	1	0	0	0	0	0
24	298	272	14	10	2	0	0	0
				0				
Total	1,746	654	56	482	124	78	352	3,250

Total Employment within Study Area = 1,746

To calculate future employment in TAZs that are largely undeveloped, DEA first estimated the amount of buildable land based on maps contained in the City's Comprehensive Plan. Employment was then assigned based on average densities (employees per gross acre) of the expected land use, which were calculated from information contained in the Institute of Transportation Engineers' *Trip Generation* report and from previous demographic studies done for small cities in Oregon.

Vacant land designated in the Comprehensive Plan for industrial use was assigned five employees per acre. Vacant land designated for commercial use was assigned six employees per acre--80 percent of the employees in commercial (non-office) jobs, and 20 percent in office jobs. Commercial-designated land allows such uses as retail, office, restaurants, hotels, gas stations, etc. For the purposes of this study, employment figures were estimated for both office and commercial (non-office) jobs.

As with residential development, DEA relied upon information from the City of Scappoose to determine which areas are expected to develop before others. For example, the proposed Fred Meyer store in the southern part of Scappoose is expected to employ approximately 200 people and will also attract other businesses to that part of town. Industrial firms have expressed interest in locating to TAZ 5, leading to significant new employment in that area, also.

As mentioned above, the study area's current population-to-employment ratio is 5 to 1. The ratio may decrease somewhat as Scappoose grows and more jobs are available in the city. However, a significant portion of residents will continue to commute to larger employment bases. Based on the assumptions used for the 2015 forecast, the population-to-employment ratio would be approximately 4.7 to 1. The 20-year average annual growth rate for employment would be 3.4 percent, slightly higher than population growth.

V. CONCLUSIONS AND LIMITATIONS OF THE DATA

Assuming current trends continue, Scappoose will experience moderate population and employment growth over the next 20 years. According to the estimates, there is enough buildable residential, commercial, and industrial land within the UGB to accommodate the expected growth.

Employment growth will at least keep pace with population growth, and may grow at a slightly faster rate as more residents will demand goods and services and will work within the study area rather than commuting to jobs outside the city.

This study was prepared to estimate current conditions and expected growth patterns which will be used in a computer model to determine future transportation needs. The amount of growth, and where it occurs, will affect traffic and transportation facilities in the study area. It should be noted that the study area was defined specifically for use with the computer

model and that this demographic analysis was designed specifically for use in developing Scappoose's TSP. This report is not intended to provide an accurate economic forecast or housing analysis, and it should not be used for any purpose other than that for which it was designed.

ODOT0123\scapdemo.doc

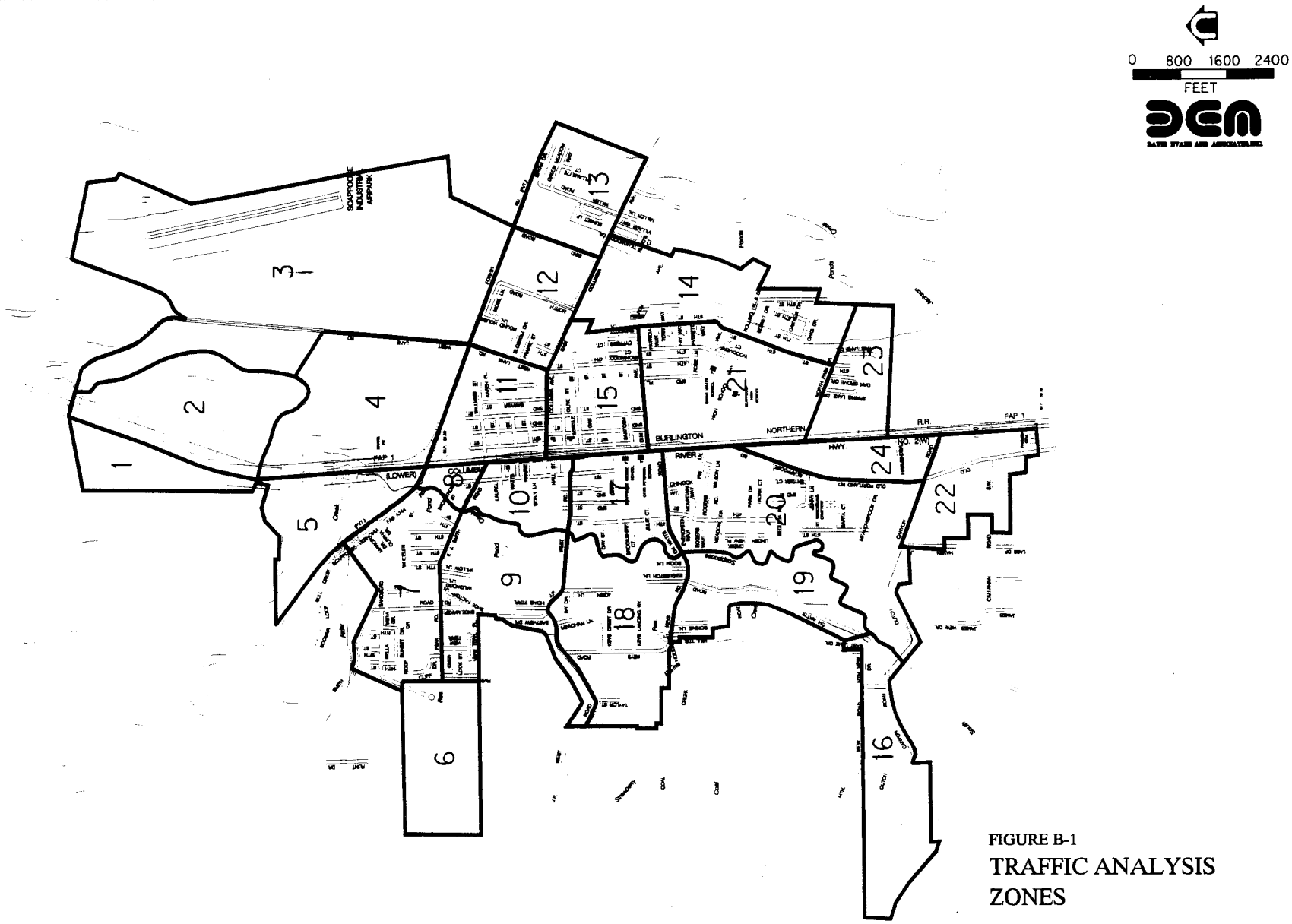


FIGURE B-1
TRAFFIC ANALYSIS ZONES

0 800 1600 2400
FEET

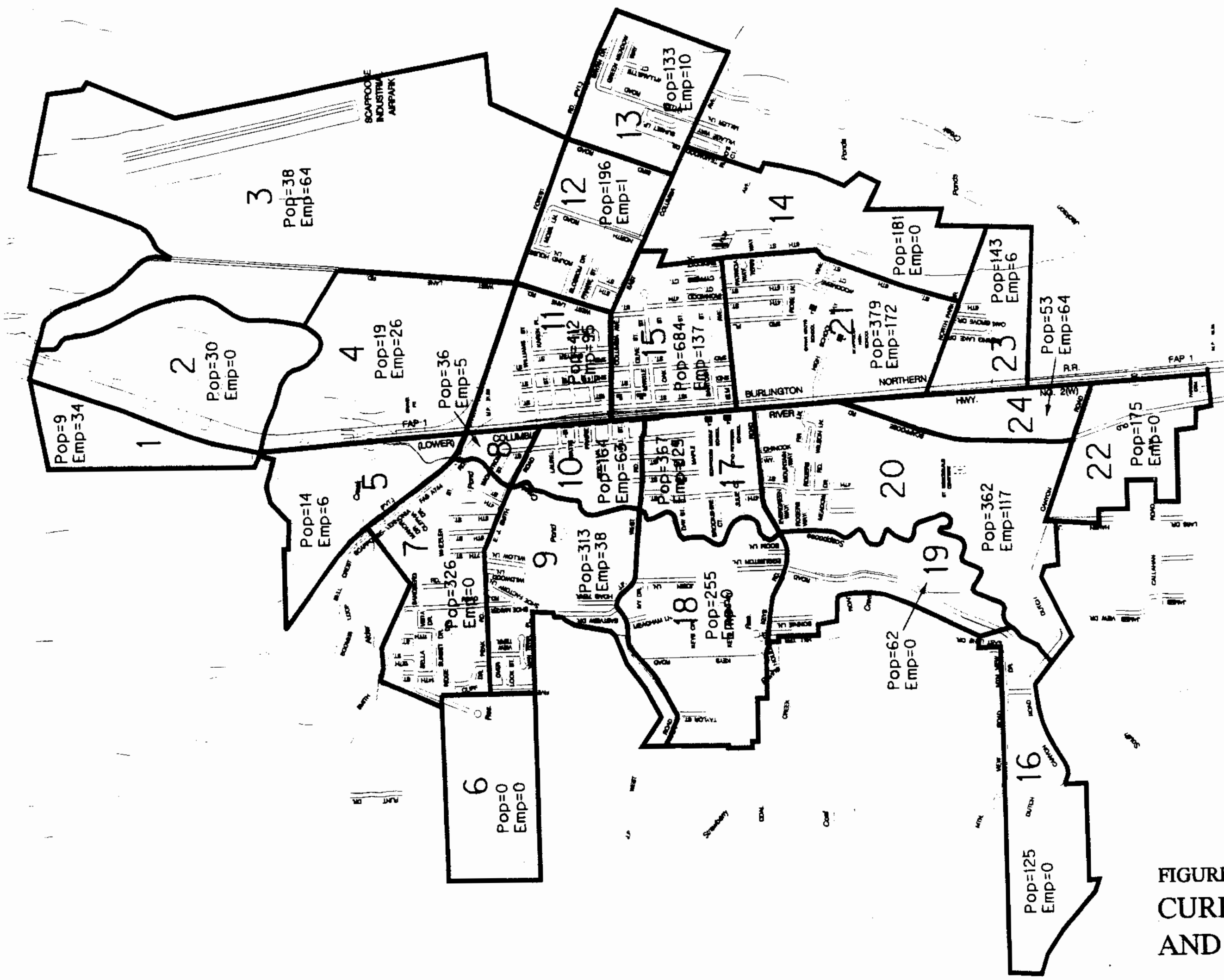


FIGURE C-1
CURRENT POPULATION AND EMPLOYMENT

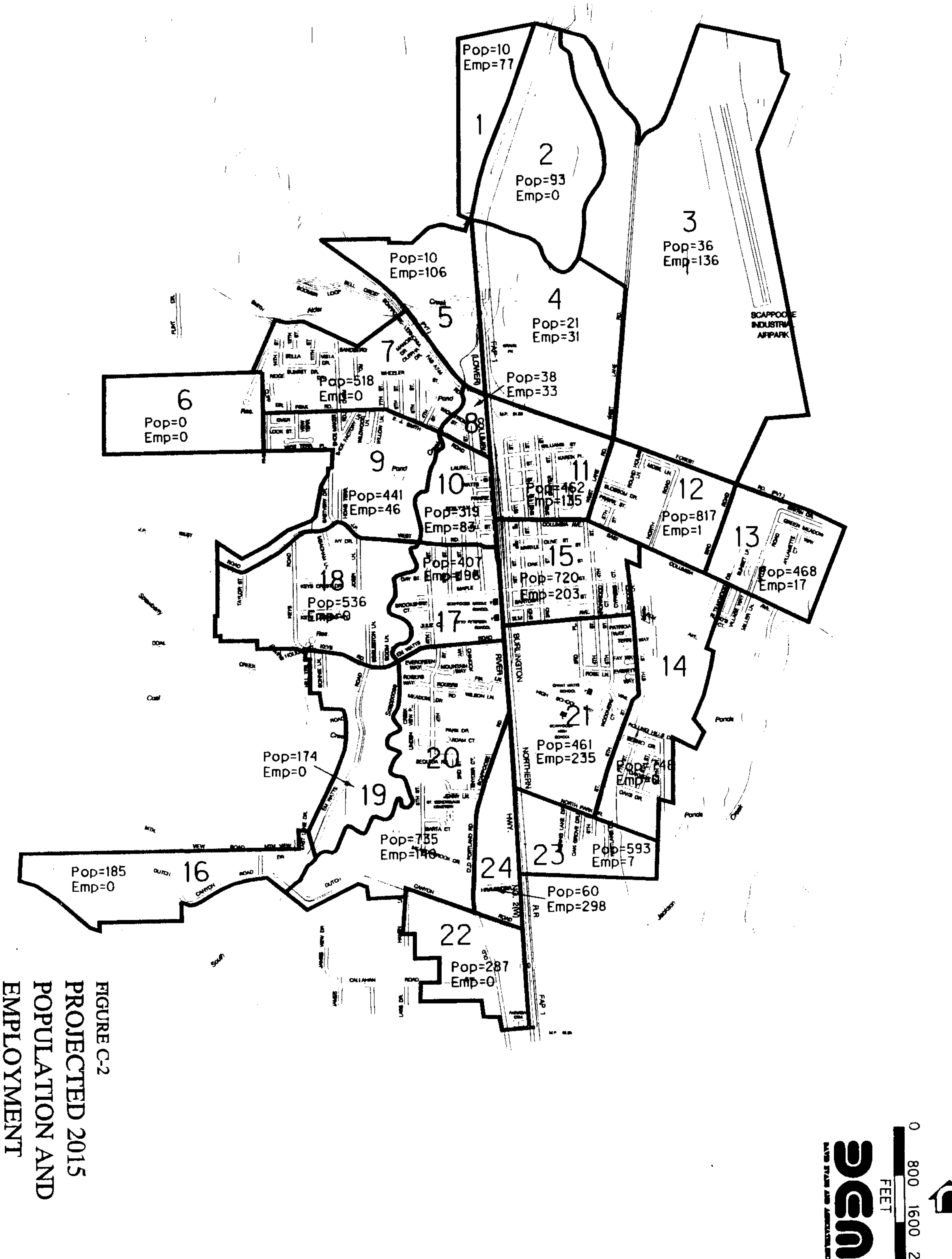


FIGURE C-2
PROJECTED 2015
POPULATION AND
EMPLOYMENT

APPENDIX D

SUMMARY OF TRANSPORTATION FUNDING PROGRAMS

Table D-1: Summary of Transportation Funding Programs—Federal, State, and Local Sources

Program Name	Description	Potential For Local Governments
FEDERAL		
Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)	ISTEA is designed to provide flexibility in federal funding of transportation projects. ISTEA established several funding programs including the: (1) National Highway System, (2) Interstate Program; (3) Surface Transportation Program; (4) Congestion Management and Air Quality Improvements Program; and (5) National Scenic Byways Program.	As a grant/transfer program, ISTEA provides funds to selected projects that meet the program's funding criteria. As with all grants, costs to local residents are low, political acceptability is high, and financial capacity and stability are less predictable than for many local funding sources. Local governments should coordinate with the ODOT Region planners to identify projects that are suitable for funding under ISTEA. ISTEA funds are distributed primarily through the Statewide Transportation Improvement Program(STIP) process.
Surface Transportation Program (STP)	The Surface Transportation Program (STP) was authorized by Title I of the ISTEA. The STP funds are allocated to the state and sub-allocated to cities and counties on a formula basis by the Oregon Transportation Commission. STP funds may be used for any road that is larger than a local or rural minor collector. Projects must be included in the Statewide Transportation Improvement Program(STIP) to receive STP funds.	Cities can propose projects through their regional ODOT offices. The project sponsor (county, city, or state) must request inclusion of the project in the bi-annual STIP. The STP provides funds to selected projects that meet program criteria. Local governments should coordinate with the ODOT Region planners to identify projects that are suitable for funding under ISTEA.
Transportation Enhancement Program (Part of STP)	The ISTEA includes provisions that require the state to set aside a portion of its Surface Transportation Program (STP) funds for projects that will enhance the cultural and environmental value of the state's transportation system. Eligible transportation enhancement projects must be directly related to the intermodal transportation system. This program funds enhancements including pedestrian and bicycle facilities; preservation of abandoned railway corridors; landscaping and other scenic beautification; control and removal of outdoor advertising; acquisition of scenic easements and scenic or historic sites; scenic or historic highway programs; historic preservation; rehabilitation and operation of historic transportation buildings, structures, or facilities; archaeological planning and research; and mitigation of water pollution due to highway runoff.	Enhancement project applications are submitted to the applicant's ODOT Region Manager. Proposed projects are then screened and prioritized by the Transportation Enhancement Committee. Approved projects receive funding under the state's transportation enhancement activities program. Transportation enhancement projects are selected as part of the STIP development. This program provides opportunities to fund selected projects that meet program criteria. Local governments should coordinate with the ODOT Region planners to identify projects that are suitable for funding under ISTEA.
Highway Enhancement System (HES)	The FHWA Highway Enhancement System Program provides funding for safety improvement projects on public roads. Safety improvement projects may occur on any public road and must be sponsored by a county or city. To be eligible for federal aid, a project should be part of either the annual element of a Transportation System Plan or the annual listing of rural projects by ODOT, although they do not have to be part of the approved STIP to receive HES funding.	The HES program funds selected projects that meet program criteria. Local governments should coordinate with the ODOT Region planners to identify projects that are suitable for funding under ISTEA.
Bridge Replacement and Rehabilitation Program	The ISTEA Bridge Replacement and Rehabilitation Program provides funds to replace or maintain existing bridges; new bridges are not eligible for funding from this program.	Currently, Bridge Replacement and Rehabilitation funds are distributed through the STIP process. In the future, these funds will be distributed according to the Unified Bridge Program, a rating system that indicates the condition and traffic level on each bridge in the state.

Table D-1: Summary of Transportation Funding Programs—Federal, State, and Local Sources

Program Name	Description	Potential For Local Governments
FEDERAL		
Community Development Block Grants (CDBG)	Community Development Block Grants (CDBG) are administered by the Department of Housing and Urban Development (HUD) and could potentially be used for transportation improvements in eligible areas. The City of Medford, for example, uses CDBG funds to provide street lights and sidewalk improvements in older areas of that city.	CDBG has the potential to provide funding for eligible projects, but the prospects for increased municipal revenues from CDBG are limited. Long-term stability of this source is uncertain. Cities have traditionally used CDBG funds for projects other than transportation. Although CDBG funds could be used for transportation, the city may have other priorities for this funding source. Overall potential of this source for transportation funding is low.
STATE		
Oregon Highway Fund	The Oregon Highway Fund is composed of gas taxes, vehicle registration fees, and weight-mile taxes assessed on freight carriers. In 1994, the state gas tax was $0.24 per gallon and vehicle registration fees were $15 annually. Revenues are divided as follows: 16% to cities, 24% to counties, and 60% to ODOT. The city share of the State Highway Fund is allocated based on population, and the county share is allocated based on vehicle registrations. ORS 366.514 requires at least one percent of the State Highway Fund received by ODOT, counties and cities be expended for the development of footpaths and bikeways. ODOT administers its bicycle funds, handles bikeway planning, design, engineering and construction, and provides technical assistance and advice to local governments concerning bikeways.	Cities received about $90 million and counties $135 million from the Oregon Highway Fund in FY 1994-95. Revenues from this source are relatively stable, but, because the Oregon Highway Fund is not indexed for inflation, its real value could decrease if taxes are not increased. The bikeway set-aside provides opportunities to fund bicycle and pedestrian projects. Local governments should work with the ODOT Region planners to identify projects that are suitable for state funding under this program.
Special City Allotment	ODOT sets aside $1 million to distribute to cities with population less than 5,000. Projects to improve safety or increase capacity on local roads are reviewed annually and ranked on a statewide basis by a committee of regional representatives. Projects are eligible for a maximum of $25,000 each.	Cities should consult with ODOT Region planners to seek funding through the Special City Allotment program.
Special Public Works Funds (SPWF)	The State of Oregon allocates a portion of state lottery revenues for economic development. The Oregon Economic Development Department provides grants and loans through the SPWF program to construct, improve and repair infrastructure in commercial/industrial areas to support local economic development and create new jobs. The SPWF provides a maximum grant of $500,000 for projects that will help create or retain a minimum of 50 jobs.	Cities and counties can use SPWF funds for transportation projects. One potential use for SPWF funds is to develop infrastructure in office or industrial parks. As with many grant programs, stability and long-term potential of this source is uncertain. Local governments apply for SPWF by using the application included in the Special Public Works/Oregon Bond Bank Handbook, available from OEDD.

Table D-1: Summary of Transportation Funding Programs—Federal, State, and Local Sources

Program Name	Description	Potential For Local Governments
STATE		
Immediate Opportunity Fund	The Immediate Opportunity Fund is intended to support economic development in Oregon by providing road improvements where they will assure job development opportunities by influencing the location or retention of a firm or economic development. The fund may be used only when other sources of funding are unavailable or insufficient, and is restricted to job retention and committed job creation opportunities. To be eligible, a project must require an immediate commitment of road construction funds to address an actual transportation problem. The applicant must show that the location decision of a firm or development depends on those transportation improvements, and the jobs created by the development must be "primary" jobs such as manufacturing, distribution, or service jobs.	The fund is financed at $5 million per year to a maximum of $40 million through FY 1996. The maximum amount available for a single project is $500,000 or 10 percent of the annual program level. Matching funds are required, and may be provided by either public or private sources. Donations of right-of-way can be considered to be part of the match. Preference is given to project proposals offering a match of 50 percent or more. The Immediate Opportunity Fund is administered by ODOT, but is used primarily in conjunction with projects funded by OEDD. Local governments should contact their local ODOT and OEDD representative to determine if they are eligible for grants under this program.
Transportation Access Charges	The most familiar form of a transportation access charge is a bridge or highway toll. Transportation access charges are most appropriate for high-speed limited access corridors, service in high-demand corridors, and bypass facilities to avoid congested areas. Congestion pricing, where drivers are charged for the trips they make based on location and time of day, is the most efficient policy for dealing with urban congestion. It not only generates revenue for maintenance and improvements, but also decreases congestion and the need for capital improvements by increasing the cost of trips during peak periods.	Toll roads are relatively uncommon in Oregon and would not receive public support unless the benefits (improved access, safety, or decreased travel times) were clearly perceived by users. The Oregon Revised Statues allow ODOT to construct toll bridges to connect state highways and improve safety and capacity. The Statutes also allow private development of toll bridges. Recent actions by the Oregon Legislature provide authority for developing toll roads. State authority for congestion pricing does not exist: new legislation would be required.
Traffic Control Projects	The state maintains a policy of sharing installation, maintenance, and operational costs for traffic signals and luminaire units at intersections between state highways and city streets (or county roads). Intersections involving a state highway and a city street (or county road), which are included on the state-wide priority list are eligible to participate in the cost sharing policy. ODOT establishes a statewide priority list for traffic signal installations on the State Highway System. The priority system is based on warrants outlined in the Manual for Uniform Traffic Control Devices. Local agencies are responsible for coordinating the statewide signal priority list with local road requirements.	The Traffic Control Projects program provides opportunities to fund projects that meet program criteria. Local governments should coordinate with the ODOT Region planners to identify projects that are suitable for funding.
Oregon Bicycle and Pedestrian Program	The Oregon Bicycle and Pedestrian Program provides grants totaling about $450,000 per year to cities and counties for bicycle and pedestrian facility improvements and bicycle maps.	Projects are selected by the Bicycle and Pedestrian Advisory committee based on the following criteria: linkage with existing facilities; importance of destinations; usage levels and type of use; and hazards of existing roadways.

Table D-1: Summary of Transportation Funding Programs—Federal, State, and Local Sources

Program Name	Description	Potential For Local Governments
LOCAL		
Special Assessments/ Local Improvement Districts	Special assessments are charges levied on property owners for neighborhood public facilities and services, with each property assessed a portion of total project cost. They are commonly used for such public works projects as street paving, drainage, parking facilities, and sewer lines. The justification for such levies is that many of these public works activities provide services to or directly enhance the value of nearby land, thereby providing direct financial benefit to its owners. Local Improvement Districts (LIDs) are legal entities established by local governments to levy special assessments designed to fund improvements that have local benefits. Through a LID, streets or other transportation improvements are constructed and a fee is assessed to adjacent property owners.	Both special assessments and LIDs require property owners pay assessments for transportation infrastructure. Establishing a LID requires approval of property owners within the district. Special assessments and LIDs are most appropriate where improvements clearly benefit properties that would be assessed. Local governments should seek to use special assessments and LIDs to finance transportation improvements wherever property owner support appears possible.
Systems Development Charges (Impact Fees)	Systems Development Charges (SDCs) are fees paid by land developers intended to reflect the increased capital costs incurred by a jurisdiction or utility as a result of a development. Development charges are calculated to include the costs of impacts on adjacent areas or services, such as increased school enrollment, parks and recreation use, or traffic congestion. The SDC typically varies by the type of development. SDCs are used by many counties and cities throughout Oregon.	The basic principle for setting a transportation SDC is to charge each new development its proportional share of the cost of constructing enough new road and other system improvements to accommodate traffic from all new development causing the need for improvement. The financial capacity of a systems development charge depends on the volume of development and the amount of the SDC. Fees are seldom set to recover the full cost of developing off-site road capacity to accommodate the new development. Local governments should continue to use SDCs to fund improvements needed to serve new development. They may want to increase the fees to more fully recover the cost of improvements needed by new development if those costs limit funding for other needed improvements.
Local Gas Tax	A local gas tax is assessed at the pump and added to existing state and federal taxes. Tillamook, The Dalles, and Woodburn are Oregon cities that have a local gas tax. Multnomah and Washington Counties also have gas taxes.	Local gas taxes typically range from $.01 to $.03. Revenues from a gas tax are typically substantial and relatively stable. Local option gas taxes require countywide voter approval under current state statutes. These taxes are often strongly opposed by area gasoline retailers who fear the tax will reduce sales. Most proposed local option gas taxes have not been approved by voters.
Local Parking Fees	Parking fees are a common means of generating revenue for public parking maintenance and development. Most cities have some public parking and many charge nominal fees for use of public parking. Cities also generate revenues from parking citations. These fees are generally used for parking-related maintenance and improvements.	Parking fees are a reasonable means of paying for a scarce resource (parking spaces) in densely developed areas. A city's ability to generate enough additional revenue from this source to address unfunded transportation needs is limited.

Table D-1: Summary of Transportation Funding Programs—Federal, State, and Local Sources

Program Name	Description	Potential For Local Governments
LOCAL		
Street Utility Fee	Most city residents pay water and sewer utility fees. Street utility fees apply the same concepts to city streets. A fee is assessed to all businesses and households in the city for use of streets based on the amount of use typically generated by a particular use. For example, a single-family residence might, on average, generate 10 vehicle trips per day compared to 130 trips per 1,000 square feet of floor area for retail uses. Therefore, the retail use would be assessed a higher fee based on higher use. Street utility fees differ from water and sewer fees because usage cannot be easily monitored. Street user fees are typically used to pay for maintenance more than for capital projects.	Street utility fees have a potential to be a substantial and stable revenue stream for local jurisdictions. This is a relatively equitable approach because it assesses households and businesses based on trip generation. Street utility fee revenue will grow with population growth, and local jurisdictions can increase the fee to reflect increased costs of providing transportation services. A street utility fee currently generates over $1 million annually in Medford. The amount of the fee is based on the type of land use that relates to trip generation. Single-family residences pay $2.00 per month in Medford. In Ashland, a fee of $1.60 per month generates about $200,000 per year.
Vehicle Registration Fees	Counties can implement a local vehicle registration fee. The fee would operate similar to the state vehicle registration fee. A portion of a county's fee could be allocated to local jurisdictions.	A reasonable annual vehicle registration fee (i.e., $10) could produce substantial revenue for counties. A vehicle registration fee would be a stable and equitable approach to funding transportation improvements.
Property Taxes	Local property taxes could be used to fund transportation. Most counties and cities, however, avoid using property taxes to fund transportation.	In Oregon, Ballot Measure 5 places a $10 per $1,000 in assessed value ceiling on property tax rates for non-school expenditures. Using existing property tax funds would reduce funding for other services, such as police and fire. New property tax levies for transportation would require voter approval. The potential for using property tax revenues for transportation purposes is limited more by the need for voter approval than by Ballot Measure 5. Property tax revenue would be a stable and potentially substantial revenue source.
Revenue Bonds	Revenue Bonds are bonds where debt service is financed by user charges, such as service charges, tolls, admissions fees, and rents. If revenues from user charges are not sufficient to meet the debt service payments, the issuer generally is not legally obligated to levy taxes to avoid default, unless they are also backed by the full faith and credit of the issuing governmental unit. In that case, they are called *indirect general obligation bonds*. Revenue bonds could be secured by a local gas tax, street utility fee, or other transportation-related stable revenue stream.	Local governments could sell revenue bonds using one of several income streams pledged to repay the bonds. Bond underwriters analyze the reliability of the revenue stream when rating the bonds and assigning an interest rate; the more stable the revenue stream backing a revenue bond, the less interest the issuer will have to pay.

Table D-1: Summary of Transportation Funding Programs—Federal, State, and Local Sources

Program Name	Description	Potential For Local Governments
LOCAL		
General Obligation Bonds	General obligation (GO) bonds are financed by all taxpayers of the issuing governmental unit, which must pay the interest and principal on the debt as they come due. *Municipal bonds* are GO bonds issued by a local governmental subdivision, such as a city, and are secured by the full faith and credit of the issuing municipality. Oregon law requires GO bonds to be authorized by popular vote. The *Oregon Bond Manual* states that "In Oregon, a GO pledge means that all unrestricted resources of the issuer may be used to meet debt service, including an unlimited property tax on all taxable property within the district." GO bonds have the added benefit of falling outside the Measure 5 tax limitation.	The financial capacity of bonds would vary with each issuance. GO bonds provide a mechanism to raise millions of dollars for transportation projects. The City of Salem has used GO bonds for street maintenance. GO bonds are repaid with revenues generated from property taxes. Revenues used to repay bonds are not based on impacts to the transportation system and are less equitable than other funding mechanisms. Voters must approve GO bonds. GO bonds have had mixed results in recent elections. Bond levies are exempt from the Measure 5 limit of $10 per $1,000 assessed value.

Source: Compiled by ECONorthwest.

APPENDIX E
SDC RATES FOR TRANSPORTATION BASED ON PROJECT COSTS IN THE SCAPPOOSE TSP

The Scappoose TSP includes projects that will serve new development by adding capacity to existing streets or by constructing new streets. Those projects have a total cost of about $19 million over the next 20 years. Our analysis of future SDC revenue based on existing rates revealed that SDC revenue from new development would generate only $1.3 million, or about 7 percent of the costs of projects needed to serve the new development.

What would the SDC rates have to be if the city wants those rates to be sufficient to collect almost $19 million over the next 20 years? To answer that question, we used Scappoose's existing SDC method,[1] which has four steps:

1. Trip Generation: The estimated increase in total daily trips between 1995 and 2015 is reported in the TSP, based on the housing and employment forecasts in the TSP and trip generation rates from the *Transportation and Traffic Engineering Handbook*. These trips will be generated by new development, and many of the projects in the TSP will be needed to serve this increased travel demand. The estimated increase in total daily trips by 2015 is 32,895.

2. Cost of Required Improvements to Serve New Development: Current city policy is that SDC funds can only be used to provide excess capacity on arterials or collectors beyond that needed for local traffic.[2] For this step we used the cost of projects that would widen or construct new collector or arterial streets (see Appendix A), except those projects we expect ODOT to fund or that are in currently developed portions of Scappoose. For new construction, we used 20 percent of the total cost to estimate the portion of total project cost attributable to excess capacity. The cost of constructing a residential street is about 77 percent of the cost of constructing a major collector,[3] so the cost of providing capacity beyond that needed for local traffic is about 23 percent of the cost of constructing a major collector.[4] To be conservative, we assumed SDC funds can be use for 20 percent of the cost of new construction for projects in the TSP that will serve new development. These costs total about $19.3 million (in 1995 dollars) over the twenty year period in the TSP.

3. Cost per Trip: This is simply the cost of improvements required for new development divided by the number of trips generated by future development. The cost per trip, using the improvement cost total from the TSP in Step 2, is $587.

4. SDC Rates by Development Type: SDC rates are calculated based on the number of trips generated by different development types (from the *Transportation and Traffic Engineering Handbook*) and the cost per trip from step 3.

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[1] City of Scappoose, Resolution No. 539, adopted August 3, 1992.

[2] City of Scappoose, Resolution No. 539, adopted August 3, 1992.

[3] Typical construction costs per mile from David Evans and Associates, *Regional Transportation Plan, Rogue Valley Metropolitan Planning Organization*, October 1995.

[4] Highway 30 is the only arterial street in Scappoose, and improvements to Highway 30 will be funded by ODOT rather than SDC revenue. Some of the projects in the TSP would construct minor collectors, which would be 2' narrower than a major collector. We do not have information on the typical construction cost of minor collector streets.

Compared to the city's existing SDC methodology, information from the TSP reduces the increase in daily trips,[5] increases the cost of required improvements to serve new development, reduces categories of development types, and makes small changes the daily trip generation rates by development type. The SDC rates for development types based on these changes are shown in Table E-1.

TABLE E-1
SDC RATES BASED ON IMPROVEMENT COSTS IN THE SCAPPOOSE TSP

Development	Trips/Day	Unit	SDC Charge
Residential			
Single-family	9.55	dwelling unit	$5,608
Multi-family	6.28	dwelling unit	$3,687
Commercial			
Retail/Commercial	40.00	employee	$23,487
Industrial	3.02	employee	$1,773
Professional Offices	6.98	employee	$4,098
School	15.00	employee	$7,046
Government	15.00	employee	$8,808

Source: ECONorthwest, based on methods explained in the text of this appendix.

Table E-2 compares these rates with rates in other jurisdictions in the suburban Portland area. This table shows that SDC rates based on the improvement costs in the Scappoose TSP would be much higher than those charged in other jurisdictions.

[5] The increase in daily trips in the existing methodology is based on full build-out of vacant land in the city; the increase in daily trips in the TSP is based on 20 years of housing and employment growth, which is less than full build-out of vacant land in the city.

TABLE E-2
INCREASED SDC RATES IN SCAPPOOSE COMPARED TO OTHER JURISDICTIONS

Type of Development	Scappoose (Increased)	Washington County	Newberg	Wilsonville	Oregon City
Single-Family	$5,608	$1,520	$1,200	$2,190	$1,210
Multi-Family	$3,687	$1,020	$810	$1,560	$800
Retail (100,000)	$2,348,700	$282,140	$216,950	$428,340	$239,340

Source: City of Scappoose; Kittelson & Associates, *Transportation Systems Development Charge Methodology, City of Salem*, 1994.

Oregon law requires a city's SDC rates to be based on a methodology that links the cost of capital improvements needed to increase capacity for new development to the new development being charged.[6] The SDC rates for transportation based on costs in the Scappoose TSP, however, are so high that they would probably discourage development in the city and would probably be politically unacceptable to local residents. Oregon law does not require cities to charge new development the full cost of improvements needed to serve that new development. There are several ways Scappoose's methodology could be structured to reduce the rates charged to new development; two examples are:

1. The cost of improvements needed to serve new development could be changed by eliminating projects from those included to calculate the cost of new improvements needed to serve new development. The City of Salem, for example, set SDC rates by choosing a package of improvements to include in their SDC methodology (projects were grouped by type and location).[7]

2. The city can decide that new development should fund only a percentage of the cost of projects needed to serve new development (i.e., 50 percent).

We suggest that Scappoose should set SDC rates for transportation by deciding that new development should share only a portion of the cost of improvements needed to serve the new development. This alternative has several advantages:

- SDC rates can be increased easily by increasing the percentage of total cost new development is expected to contribute. The city would not need to adopt a new SDC methodology to increase rates.

- By this method the city appears to be giving new development a break by charging it less than 100 percent of its share of the cost of needed improvements. This may help reduce political opposition to the increased SDC rates.

- Were the city to include fewer projects to reduce the total cost of projects needed to serve new development in Step 2, some people may argue that the city could fund only those projects with

[6] *Oregon Revised Statutes*, 1995 Edition, Chapter 223, sections 223.297–223.314.

[7] Kittelson & Associates, Inc., *Transportation Systems Development Charge: Methodology, City of Salem*, 1994.

SDC funds. While our reading of Oregon law[8] suggests that the city can fund any project that increases capacity by adding that project to the city's capital improvement plan, the city may want to avoid this issue by including as many projects as possible in the SDC methodology.

Table E-3 shows the SDC rates that would result from various shares of total improvement cost.

TABLE E-3
SDC RATES FROM VARIOUS SHARES OF TOTAL IMPROVEMENT COSTS IN THE SCAPPOOSE TSP

Development Type	30%	25%	20%
Residential			
Single-family	$1,682	$1,402	$1,122
Multi-family	$1,106	$922	$737
Commercial			
Retail/Commercial	$7,046	$5,872	$4,697
Industrial	$532	$443	$355
Professional Offices	$1,230	$1,025	$820
School	$2,114	$1,762	$1,409
Government	$2,642	$2,202	$1,762

Source: ECONorthwest, based on methods explained in the text of this appendix.

We estimated future revenue from the SDC rates shown in Table E-3, based on employment forecasts in the TSP. The results are shown in Table E-4.

TABLE E-4
SDC REVENUE BY TIME PERIOD BASED ON VARIOUS SHARES OF TOTAL IMPROVEMENT COSTS (ROUNDED 1995 DOLLARS)

	100%	30%	25%	20%
Years 1-5	$3,490,000	$1,050,000	$870,000	$700,000
Years 6-10	$4,200,000	$1,260,000	$1,050,000	$840,000
Years 11-20	$11,210,000	$3,360,000	$2,800,000	$2,240,000
Total	$18,900,000	$5,670,000	$4,730,000	$3,780,000

Source: ECONorthwest.

[8] *Oregon Revised Statutes*, 1995 Edition, Chapter 223, sections 223.297–223.314.

We expect that Scappoose will want to choose a percentage that makes the SDC rates for residential development comparable to the low end of SDC rates in other suburban Portland jurisdictions. For the analysis in this report, we assume the city will decide that new development should pay 25 percent of the cost of improvements to collectors needed to provide excess capacity to serve traffic generated by the new development.

The city's current SDC methodology does not include a reimbursement fee to recover costs for arterial and collector streets that are constructed in advance of new development. This is because most of the city's collector and arterial streets were not constructed by and are not the responsibility of the city. In the future, however, the city may want or need to improve arterial or collector streets in advance of new development. We recommend that the city add a reimbursement fee to their SDC methodology.