City of Rainier Transportation System Plan

Rainier, Oregon

To the Attention of:
City of Rainier
Dwayne Barnes
Public Works Director
P.O. Box 100
Rainier, Oregon 97048

Prepared by:
Kittelson & Associates, Inc.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230

In Association with:
Tashman, Johnson, LLC, and W & H Pacific

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Acknowledgments

Project Advisory Committee

Robert Jacobsen	Mayor, City of Rainier
Dwayne Barnes	Superintendent of Public Works, City of Rainier
Erin Knox	City Clerk, City of Rainier
Tim Wilson	ODOT Region 1
Jim Brown	Columbia County Economic Development
Rosemary Brinson-Siipola	Cowlitz-Wahkiakum Council of Governments
Greg Jenks	Oregon Economic Development
Jim Johnson	Dept. of Land Conservation and Development
Gene Carlson	REDCO
Peter Williamson	Port of St. Helens
Randy Hamlin	Citizen

Project Staff

Jeffrey Tashman	Tashman Johnson LLC
Peter Haliburton	Kittelson & Associates, Inc.
Dan Seeman	Kittelson & Associates, Inc.
Dave Siegel	W&H Pacific, Inc.
Phill Wuest	Portland State University, Center for Urban Studies

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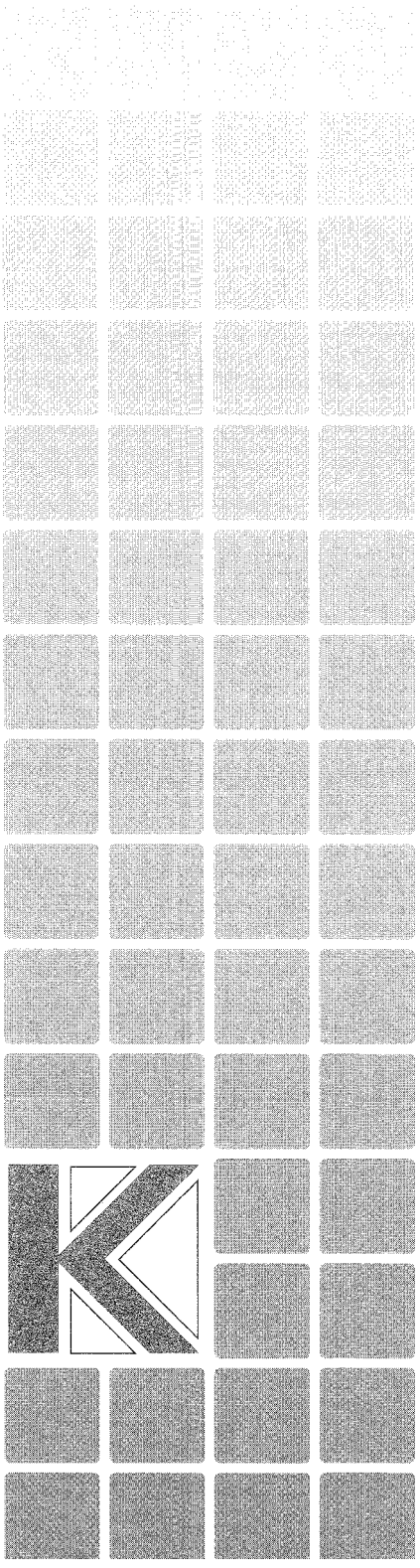


Executive Summary

Executive Summary

A comprehensive analysis of the transportation system in the Rainier area has been prepared in conjunction with the Oregon Department of Transportation, the City of Rainier, the Rainier Transportation Plan Advisory Committee and Portland State University. This plan has been prepared in accordance with the requirements of Oregon Revised Statute 197.912, OAR 660 Division 12 (Transportation Planning Rule [TPR]).

Although, by virtue of its size (less than 2,500 people, the City of Rainier may be eligible for an exemption from OAR 660, the Council decided to prepare a long-term transportation plan for the City to help guide development in the future, encourage appropriate development and maintain the city's livability.

The Rainier Transportation System Study examined all elements of the City's transportation system including road, rail, pedestrian, bicycle, transit, water, air and pipeline. Currently conditions for users of these various systems were analyzed to determine where problems exist. This included analysis of transportation safety for road and rail users. Conditions were examined for a typical summer weekday when the system experiences a higher degree of usage than is typical over the year.

It was found that generally all systems are currently operating at acceptable levels of service. While there are no areas of immediate concern, some traffic accident locations were identified (including the intersection of U.S. 30/W Sixth Street). It was also identified that there are insufficient safe locations for cyclists and pedestrians to cross U.S. 30. It was recognized that one or more parallel alternative routes to U.S. 30 should be identified and developed to reduce the community's reliance on the highway. In addition, the narrowness and winding alignments of routes south of town were identified as potential hazards in terms of conflicts between automobiles, trucks, bicycles and pedestrians.

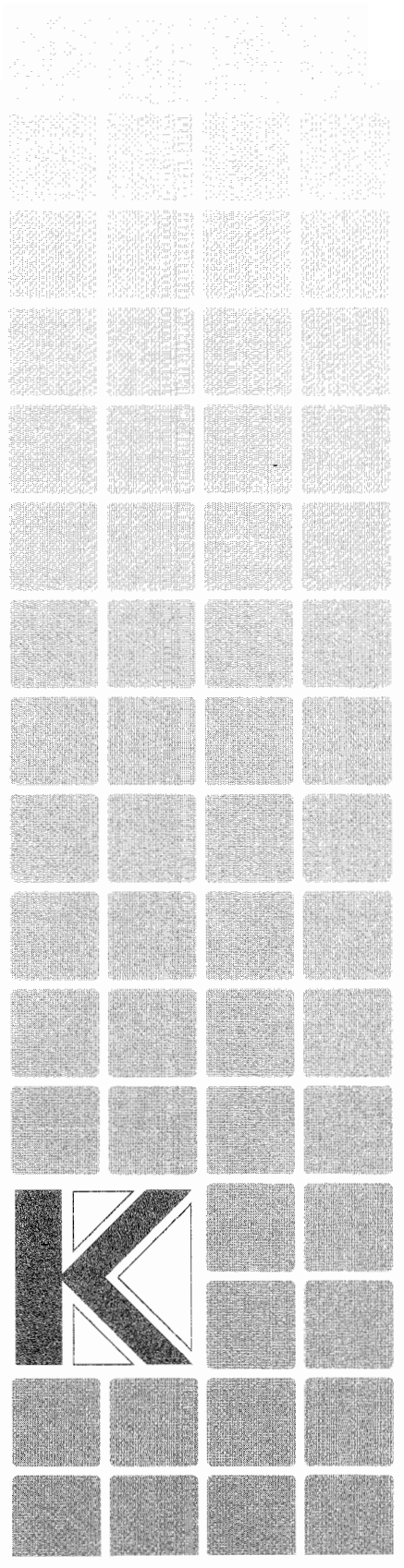
A review was made of the potential for future growth in population and employment over the next 20 years given the land within the Urban Growth Boundary. Comprehensive Plan population and employment estimates were used to forecast the increase in the number of trips with at least one trip-end in Rainier. For growth in highway trips traveling through Rainier, ODOT permanent recorder data were used. The UFOSNET travel forecasting model developed by PSU was used to assign future traffic to the roadway network.

Using these traffic growth forecasts, a 'no-build' alternative (in which no future improvements are made) was examined to determine the shortcomings of the existing system under future travel demand. Based on the identified needs, various improvement alternatives were developed and tested.

A 'preferred alternative' package of improvements for each of the transportation system elements was recommended to the project team and Planning Commission. Changes were suggested and some were made to the preferred alternative. This final report presents the Transportation System Plan for Rainier. Preliminary planning level cost estimates have been prepared as well as an implementation schedule which prioritizes which improvements will be made during the first decade and which will

be scheduled for the second decade. A finance plan and proposed land use ordinance modifications are also presented.

The City of Rainier will work closely with both Columbia County and ODOT to ensure consistency of plans, and will implement the adopted Rainier Transportation System Plan to ensure a transportation system that will support a socially desirable, economically prosperous and environmentally sound future for the community.



Section 1

Introduction

Introduction

The City of Rainier, Oregon, applied to the Oregon Department of Transportation for a grant to complete a transportation system study and prepare a twenty-year Transportation System Plan (TSP) for the community. This initiative taken by the City was not required under the Transportation Planning Rule (OAR 660 Division 12) which allows cities with populations under 2,500 to be exempted. The City felt that despite the exemption clause, they could benefit from a comprehensive long-range transportation planning study that would help to ensure that they could provide for future growth.

The product of the Rainier Transportation System Study is the Rainier Transportation System Plan presented here. This plan has been developed under the guidance of the Transportation Plan Advisory Committee (TPAC) in partnership with the local community as well as a number of reviewing agencies including the City of Rainier, Columbia County, ODOT and the Oregon Department of Land Conservation and Development (DLCD). Review comments and suggestions made by these agencies and interested parties have been incorporated into this final TSP document.

This plan consists of the following:

- An analysis of needs
- System alternatives and evaluation of impacts
- A roadway plan for a network of arterial and collector streets
- A pedestrian and bicycle mobility plan
- A transit plan
- A rail, air, water and pipeline plan
- A transportation finance plan
- Policies and ordinances for implementing the proposed transportation system plan

STUDY AREA

The City of Rainier is located in northwest Oregon, approximately 50 miles north of Portland across the Columbia River from the Longview-Kelso, Washington, metropolitan area, and forms a part of the Rainier-Longview Metropolitan Planning Organization (MPO). The Lower Columbia Highway (U.S. 30) runs through most of the City and, as the only arterial street, forms the major transportation link through the community. Traffic circulation in Rainier is limited by severe topographic constraints, as the terrain rises steeply south of Highway 30. Continuous east-west connections are limited to B Street and C Street.

The recognized study area boundary for this study coincides with the Urban Growth Boundary (UGB) which is shown in Figure 1 together with the City limits and the street system.

A number of unique conditions exist in the City of Rainier which make transportation planning for the community particularly interesting and challenging. Many of these factors also make for unusually expensive solutions. Some of these unique conditions include:

- Geographical constraints include the Columbia River to the immediate north, and steep hillside topography to the south of the town.
- The location of the railroad in the center of A Street in the downtown section creates numerous safety concerns.
- Rainier is located on the lower Columbia River Highway transportation corridor, which serves as a major coast access route from the Portland metropolitan area, and which has associated with it large seasonal fluctuations of traffic including a significant amount of summertime bicycle traffic.
- The City's economy is closely tied to the timber industry, and this results in a great deal of truck traffic on local as well as higher-order streets.
- Rainier's proximity to the Portland metropolitan area and to the Longview-Kelso MPO area attracts commute trips from Rainier, an.
- The historical roadway systems initially developed which have placed severe limitations on future land development for the City's growth. Planning for the future of Rainier presents several challenges, of which transportation is one of the primary ones.

In addition, the influence of the Lewis and Clark bridge which connects Rainier with Longview is an integral part of Rainier's transportation system. Extensive study of future alternatives for upgrading, replacing and possible relocating the bridge is on-going. For this reason, this major transportation system element was eliminated from the scope of this study.

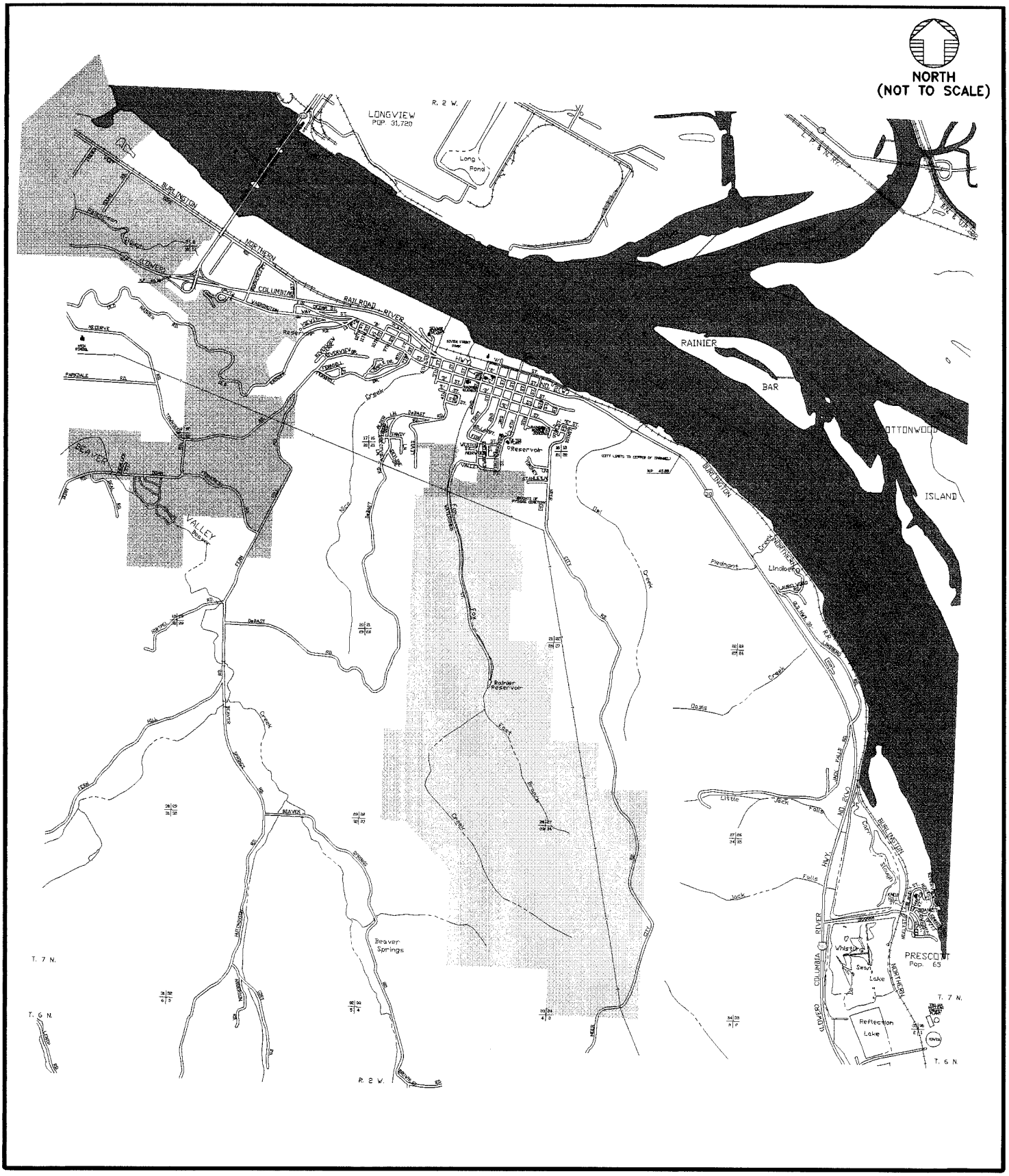
PUBLIC INVOLVEMENT

The development of the TSP was guided by the Transportation Plan Advisory Committee. The Committee met initially to define the objectives for the plan and identify key issues. The second meeting focused on the analysis of the existing transportation system and on the results of a citizen survey that identified areas of public concern. The third meeting focused on the analysis of future needs and the preferred alternative. A fourth meeting was held to review the plan. At its first meeting, the committee discussed local perspectives on the transportation system, with safety being a primary concern. Questions were asked to ascertain local sentiments on transportation problems in a number of areas including:

- the highway
- traffic and rail safety
- truck traffic
- alternative mode travel (pedestrian, bicycle and transit)

A list of the concerns raised at that meeting is included in Appendix B. The following list sums up the primary concerns of stakeholders represented at that meeting:

- provide safe pedestrian and bicycle access to schools,
- provide safe pedestrian access across U.S. 30/B Street (recent pedestrian accidents reported),
- safety improvements at U.S. 30/West Sixth Street,



LEGEND

- CITY LIMITS
- UGB
- INSIDE CITY LIMITS BUT OUTSIDE UGB

STUDY AREA

TRANSPORTATION SYSTEM STUDY RAINIER, OREGON SEPTEMBER 1997	FIGURE 1	K

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- concern regarding the (unacceptable) possibility of widening U.S. 30/B Street through the City at the potential expense of loss of on-street parking and subsequent disruption to businesses located on B Street,
- finding an alternative to Fernhill Drive access to the Beaver Valley area which is expected to be the focus of future development, and
- promote industrial development, particularly in the riverfront region along Dike Road west of downtown.

STUDY GOALS

The goals of this study used by the project team and the advisory committee were to develop transportation system plan that would:

- allow for the future provision of mobility for the community;
- improve circulation;
- ensure safety for all travel modes;
- protect, maintain and improve the transportation environment;
- balance the variety of demands on the transportation system to preserve and extend the useful life of all facilities; and
- maximize the cost effectiveness of any necessary transportation improvements to the system.

This study includes an analysis of existing conditions, identification of short and long-term transportation improvements, a preferred transportation system plan, a general transportation finance plan, and recommended amendments to the City's Comprehensive Plan and implementing ordinances.

ORGANIZATION OF THIS REPORT

Section 1, Introduction, of this report provides an introduction to the study process as well as a description of the study scope and the study area.

Section 2, Existing Conditions, describes the assessment of existing conditions which commenced with inventorying all transportation facilities within the urban growth boundary (UGB). The inventory was used to develop an understanding of the physical, operational, traffic safety and travel characteristics of all major roadways and other transportation facilities in the Rainier area.

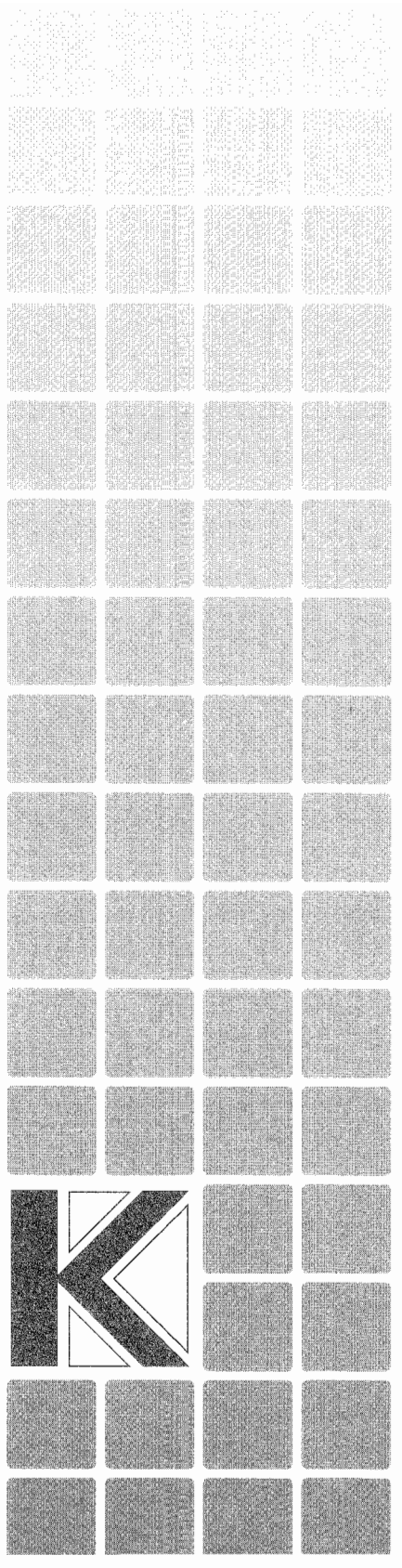
Long-term future transportation needs are identified in **Section 3, Future Conditions and Alternatives Analysis**, in the light of expected local and regional growth based on the latest update of the Comprehensive Plan. Included in this section is an evaluation of a number of alternative improvement scenarios for identified transportation system shortcomings.

The preferred transportation system improvement plan is described in **Section 4, Transportation System Plan**. This section includes the elements specific to the roadway plan, bicycle and pedestrian

plans, and the air, rail, water and pipeline plans. The implementation plan including timing of improvements is contained in this section.

The **Transportation Finance Plan** is included in **Section 5** of the report. This identifies funding alternatives available to the City to finance the improvements for which it is responsible.

Section 6, Comprehensive Plan and Implementing Ordinance Amendments, includes Comprehensive Plan Implementing Ordinance Amendments that the City will adopt in order to effectively implement certain elements of this transportation system plan.



Section 2

Existing Conditions

Existing Conditions

INTRODUCTION

This section summarizes the state of existing transportation conditions in the City for all modes of transportation. The following elements of the system are discussed:

- existing plans and policies
- current land use, population and employment
- street system
- pedestrian system elements
- bicycle system elements
- public transportation
- truck traffic routes
- air/ rail/ water/ pipeline facilities
- traffic operations conditions
- traffic safety conditions

PLANS AND POLICIES REVIEW

As part of this study, an extensive number of local, regional and national plans and policies were reviewed to ensure the study would be supportive of and integrated with relevant policies, goals and standards. The documents reviewed included:

- ISTEA (Intermodal Surface Transportation Efficiency Act - Federal)
- The Oregon Transportation Plan (OTP)
- The Oregon Highway Plan (OHP)
- Columbia County Comprehensive Plan
- Rainier Comprehensive Plan
- U.S. Highway 30 Interim Corridor Strategy Plan (Material)

The findings, conclusions and recommendations made in these plans have been respected and adhered to wherever possible and have shaped the formulation of the Rainier Transportation System Plan. Throughout this plan, numerous references are made to the recommendations made in these various plans.

LAND USE/DEMOGRAPHICS

Rainier's development pattern has been shaped by its topography and proximity to the Columbia River and Highway 30. Historic industrial and marine uses are located on the downtown waterfront, along with a mix of commercial and single and multi-family residential. Except for First St., the steep connecting streets between the waterfront (A Street) and Highway 30 (B Street) contain single family residences. This area is in a severe slide zone and future development between A and B streets may be limited. B Street downtown contains a mix of commercial, public and office uses. Though there is some street oriented small shop retail, most of the commercial uses on B street are

auto-oriented and of relatively low intensity. Development along Highway 30 after it diverges from B Street and heads northwest is limited, but there is a small concentration of commercial development immediately southeast of the bridge approach.

The waterfront northwest (downstream) of downtown is mostly vacant, except for the Rainier Community Park. Much of this land was created from fill, the most recent from the dredging of ash from the 1980 Mt. St. Helens eruption. There is a log storage facility located immediately upstream of the Rainier-Longview Bridge. A sparsely developed commercial area is located near the bridge, in between the BN tracks and Highway 30. Though much vacant land exists here, the development of this land may be limited by the presence of wetlands. Downstream of the bridge, there is a large amount of vacant industrial land between the river and the railroad track and between the track and the Highway there is a large expanse of sparsely developed light industrial land. The developability of some of this land may be impacted by wetlands.

Most of Rainier consists of low density residential development. Single family homes on modest lots (5,000 - 8,000 square feet) are located on the hills immediately above downtown and extend to the northwest. In the hills higher above downtown, development is much less dense, as the topography is even more severe. The City has recently adopted an updated Comprehensive Plan and new Zoning Ordinance and Land Division Ordinance. In addition, the City adopted the Rainier Waterfront Urban Renewal Plan which calls for intensification of a 600+ acre area including the waterfront and much of the downtown central business district.

Current Population

Table 1 shows the historic and current (1995) population figures for the City of Rainier as reported in the Comprehensive Plan update.

Table 1
Historic Population Growth

Year	Population
1900	522
1910	1,359
1920	1,287
1930	1,353
1970	1,731
1980	1,655
1990	1,674
1994	1,700
1995	1,720

Clearly, Rainier has experienced no growth in population over the last 25 years. The reasons for the lack of growth in Rainier include its distance from the Portland Metropolitan Area, the lack of a stable employment base and the lack of flat, easily developable land.

Population Projections

The population projections shown in Table 2 are taken from the Rainier Comprehensive Plan:

Table 2
Rainier Urban Growth Area Population Projections

Source:	1995	2000	2015
Center for Population Research	1,720		2,394
1980 Comprehensive Plan		4,000	
Water Master Plan			3,196
Cowlitz-Wahkiakum COG		1,824	2,139
1995 Comprehensive Plan			4,000

There is a wide range of estimates for Rainier's future population growth. The figure of 4,000 people represents continuation of the low density development that has characterized Rainier, but assumes a marked increase in the pace of development. Factors that should contribute to Rainier's growth include the growing influence of the Portland Metro Area, the scarcity of quality water-oriented industrial sites outside of Rainier and the attraction of businesses to the lower Columbia River corridor as the available workforce in the Portland metro area becomes more and more constrained.

Employment

According to 1990 Census Data, total employment in Rainier was 760. Jobs were concentrated in:

* retail trade (123)
* communications (111)
* manufacturing (75)
* education (72)
* other (379)

Rainier residents commonly work outside the community, with the PGE Trojan Nuclear facility being a major source of higher wage employment until its closure in 1993. Since then, many Rainier residents have been employed in Longview. The creation of a diverse, stable job base in Rainier is one of the City's most important objectives. Employment in Rainier is projected to increase as a result of development of the waterfront for industrial and commercial uses.

TRANSPORTATION INVENTORY

Roadway Facilities

All public roadways in the City of Rainier fall under the responsibility of one of three jurisdictions - the Oregon Department of Transportation (ODOT), Columbia County and the City.

State Facilities
U.S. Highway 30, also known as the Lower Columbia River Highway, through Rainier is designated as a highway of Statewide Importance and an Access Oregon Highway according to the Oregon Highway Plan (OHP). The highway, which connects Portland and Astoria, is the most historic and most populated route between Portland and the coast. It serves as a commuter route, experiences high truck volumes year round and in the summer, serves significant bicycle and recreational traffic. In addition to its function as a state route, B Street provides access to the many businesses located along the highway.

U.S. 30 has a two-lane cross-section from the east City limit to W. Fourth Street. Between W. Fourth Street and W. Sixth Street, it has a center left-turn lane and therefore a three-lane cross-section. West of W. Sixth Street, there are two travel lanes in each direction. A two-way center left-turn lane is provided in the section between Mill Street and Rockcrest Street. Posted speed is 40 mph as you enter the City from the east. It drops to 30 mph between E. Fifth Street and W. Seventh Street, increases to 45 mph between W. Seventh Street and W. 13th Street, and returns to 55 mph west of this point. Pavement condition along U.S. 30 is generally good with some sections in very good condition in the east part of town.

Bicycle lanes are provided in 8- foot shoulders only in the section between W. Third Street and W. Sixth Street. East of First Street, shoulder width varies between 3 and 9 feet, which accommodates some on-street parking and some room for bikes. Generally though, provision for bicycles within Rainier is poor especially considering the amount of summertime bicycle traffic. Sidewalks are provided along the length of the highway where it follows B Street except between W. Third Street and W. Sixth Street. Formal on-street parking is provided in the area one block either side of First Street.

To the west of Rainier, State Route 433 intersects with U.S. 30. The Lewis & Clark Bridge carries Route 433 across the Columbia River into Longview. This facility serves a primary role in transportation in Rainier as Longview provides the residents of Rainier with the closest substantial commercial and medical facilities, as well as other services. While S.R. 433 is a Washington State route, the Lewis & Clark Bridge is jointly owned by the States of Oregon and Washington. The bridge is currently the subject of studies investigating rebuilding or relocating this structure.

County Facilities
Columbia County maintains the following roads in District II-- Rainier:

- Neer City Road (south of E. Street)
- DeBast Road (south of the intersection with Lewis Road)
- Fernhill Drive

- Fern Hill Road
- Ferncrest Road
- Townsend Road
- Old Rainier Road (west of the City limits)
- Washington Way (west of 13th Avenue)
- Rockcrest Street
- Mill Street
- Dike Road

Each of these is a two-lane facility. No bike lanes are provided on any of these roads and sidewalk provision is minimal. Pavement condition on these County facilities varies from average to poor.

City Facilities
The remainder of the streets in Rainier are owned and maintained by the City. City streets are generally two-lane facilities (although not necessarily striped,) and traffic control is limited to stop signs at intersections with County and State facilities. Many of the local City streets in Rainier are in a poor state of repair. The steep grades have caused profiles to become uneven in the sections south of B Street. A thorough investigation is recommended into the repair and/or replacement schedule for much of this system.

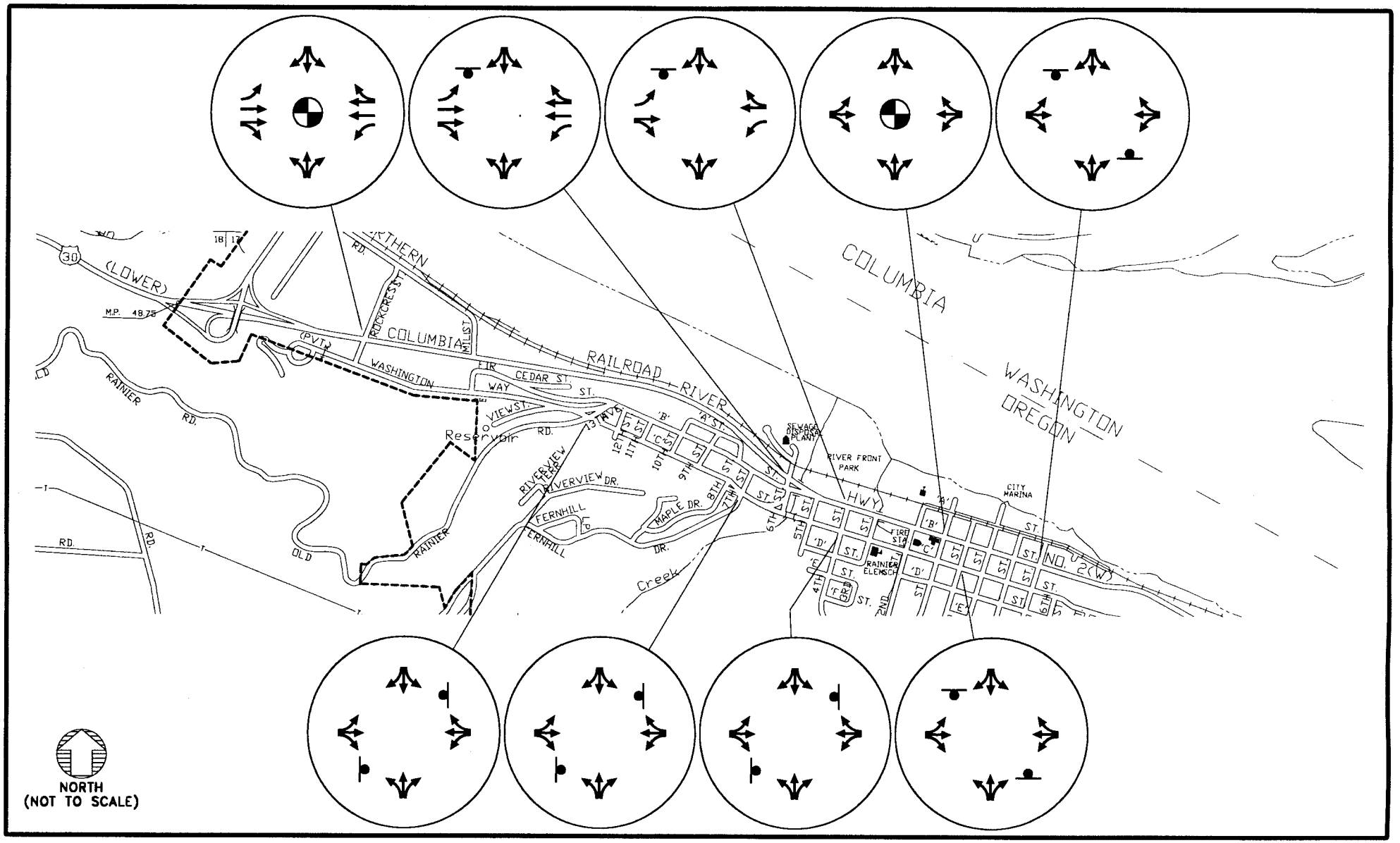
Apart from B Street, only C Street provides substantial east-west continuity and functions as a collector facility. Parking is allowed on both sides of this largely residential street. Sidewalks exist on both sides of the street in the older part of town between E. Fifth Street and W. Seventh Street with some sections missing. Outside of this area, sidewalk provision becomes somewhat inconsistent. No bicycle facilities are provided. Pavement conditions on C Street vary from poor to average, with most of the street in poor condition. The C Street bridge over Nice Creek is in a poor state of repair.

Traffic Control

There are two traffic signals within the City of Rainier - located where U.S. 30 intersects with First Street and with Rockcrest Street. Both signals are maintained by ODOT. The majority of other intersections within Rainier are stop-controlled on either two, three or four approaches. Traffic control devices for study intersections are shown in Figure 2.

Functional Classification

The City of Rainier has no existing street hierarchy/functional classification system for arterial and collector streets. U.S. 30 is a State Facility and operates as an arterial roadway. Columbia County currently classifies Fernhill Drive as a collector facility. As a result of this study, an arterial/collector street system will be proposed for the City.



LEGEND

STOP SIGN

SIGNAL

EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES

TRANSPORTATION SYSTEM STUDY RAINIER, OREGON SEPTEMBER 1997	FIGURE 2	K

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Truck/ Freight Traffic

The City of Rainier has no official signed truck routes. The location of the community on U.S. 30 ensures a high proportion of truck traffic, with most of it being through-traffic bound to or from the Lewis and Clark bridge. Rainier's history as a logging community makes it no stranger to truck traffic, and many of the trucks passing through the community continue to be related to the timber industry. Truck traffic is high on Fernhill Road.

Pedestrian Facilities and Activity

Pedestrian facilities within Rainier are limited to discontinuous sidewalks in the older parts of the City. In the commercial areas along A and B Streets, good sidewalks of at least six feet wide exist, but are not continuous. Beyond this area, sidewalks are somewhat inconsistent and in various states of repair. The sidewalks on the steep sections of the streets between and including E. Fifth Street and E. Second Street are in poor condition as the slabs have crept downhill and have very uneven joints. Pedestrian crossing opportunities along U.S. 30 are limited. The signal at First Street provides pedestrian actuation with cross-walks. In addition, there is a crosswalk located at W. Second Street.

Pedestrian activity in Rainier is affected by the steep grades, the elongated layout of the City and the highway through town. Despite these deterrents, observations revealed there is a significant amount of pedestrian travel, and this is most prevalent during the warmer months. Activity is centered around the downtown commercial areas, City Hall and the Library, and the elementary and middle schools. These areas coincide with where the best sidewalks are provided, yet there are missing links in the sidewalk system which would enhance this mode of travel. Outside of the area described, the narrow streets, lack of sidewalks and steep grades inhibit safe pedestrian movement.

Bicycle Facilities and Activity

Bicycle facilities in Rainier are limited to the bike lanes along B Street/U.S. 30 between W. Third Street and W. Sixth Street. Topographical constraints limit the attractiveness of this mode of transportation in the rest of the City. The narrow and steep streets to the south of town are not bicycle friendly, and very little activity was observed in these areas. Primary bicycle activity centers and trip generators include the elementary school on C Street, the middle school on E Street, the library at First and B Street, the riverfront park at W. Sixth and the commercial "downtown". As mentioned, there are no on-street facilities within the City apart from U.S. 30.

Public Transportation

Columbia County Transit (COLCO) provides public transit service to all Rainier residents via a dial-a-ride program. COLCO uses 14-seat minibuses and regular minivans to provide door-to-door service for residents. Three vehicles are based in Rainier, each of which was equipped with a wheelchair lift or ramp by the end of 1996.

In 1995, approximately 20,000 trips were made via this mode by Rainier residents. Although the service is offered to all, approximately 90 percent of the 20,000 annual trips made in Rainier serve senior citizens and disabled people. The majority of trips are made to medical facilities, and because

there are no hospital facilities and limited medical facilities in Columbia County, many trips are made across the Columbia River into Washington State (Longview and Kelso). Round-trip fares range between $0.50 for local in-town trips and $2.00 for trips to Longview. For senior citizens, these are "suggested" fares and are not compulsory. The service is coordinated by a volunteer dispatcher from the senior center who is on duty daily between 8:00 am and 1:00 pm. After local dispatchers have left for the day, calls are routed to the St. Helens COLCO office where full-time staff will try to schedule a ride for patrons. A COLCO spokesperson said that the service is not used as much as they would like. A good volume-to capacity ratio exists with nearly all calls serviced. The only exceptions are occasional last minute calls from a customers who may not be accommodated due to driver shortages or scheduling conflicts.

COLCO has an annual operating budget of approximately $260,000. Federal and State subsidy grants account for between 20 and 25 percent of this budget, with the rest funded by local sources including corporate and private donations. COLCO will introduce regularly scheduled service in the U.S. 30 corridor between Clatskanie and Portland during 1996 using a newly acquired 35-seat bus. Five scheduled round-trips are planned between 6:00 am and 7:00 pm each day. The cost for the round-trip will be $4.00. Local minibus and minivan service will provide feeder-service to this route within Rainier.

Air Transportation

Regularly scheduled national and international air transportation is provided via Portland International Airport which lies approximately 50 miles away and is accessed via U.S. 30 or I-5. A local general aviation airport is located between Scappoose and St. Helens.

Freight Rail

The study area is served by the Portland - Astoria Branch of the Pacific and Western Railroad, a short line operator that acquired the line from Burlington Northern in July, 1997. The Astoria line connects Portland to Astoria as one of a number of short lines that serve the Willamette Valley. It is a 95-mile branch that leaves the Burlington Northern -main line in Portland and makes stops in Scappoose, St. Helens, Port Westward, Clatskanie and Wauna before terminating in Astoria. Currently the segment of track west of Wauna is closed due to slides that occurred in the winter of 1996.

The line currently connects to the remainder of the Pacific and Western Railroad through its connections in Portland. However, the company anticipates acquiring the Cornelius Pass trackage from Burlington Northern, which would allow more extensive connections to the remainder of the Pacific and Western system in the Tualatin and Willamette Valleys and connections to Union Pacific lines.

The trackage between Portland and Clatskanie can accommodate freight train speeds of 40 mph, but between Clatskanie and Astoria maximum speeds are 10 mph. A method of measuring the use of the line is "traffic density" which is expressed in terms of million gross ton-miles per mile of track per year. This branch has a traffic density of less than one million, which is low compared to other branch lines.

Currently in Rainier, freight trains run on the average of four round trips per week, and contain an average of less than 10 cars. The primary products carried are materials used in the Wauna paper mill, but additional customers may be added at any time. The line carries a total of 250-400 cars per month, of which traffic 80% occurs between Portland and St. Helens. Structurally the line is in fair to good condition.

Even though historic traffic density is low, the new short line operator has experienced at least a temporary dramatic increase in usage in the less than two months that they have owned the line. According to community representatives, the future economic vitality of Rainier and the U.S. 30 corridor is dependent on continued rail service. The Port of Astoria and the Port of St. Helens are both aggressively and successfully promoting industrial uses that are rail dependent. The recent interest by the BHP steel fabrication and coating facility in locating on a 100-acre site in Rainier resulted in part from the availability of rail service, and the company's decision to locate in Kalama is thought to result partly from the superior rail service available in that community. The currently on-going Highway 30 Corridor study is addressing the issue of the need to retain rail service on this line.

Passenger Rail

Passenger service is provided to the Rainier vicinity by Amtrak, which has a stop in Kelso-Longview. Currently daily train service is provided by the Coast Starlight, the Northwest Talgo and the Mount Rainier, with additional service by the Pioneer on Monday, Wednesday and Saturday.

Increasing the frequency and speed of rail service between Eugene and Vancouver B.C. is the goal of the Cascadia High Speed Rail Project. This project, being pursued by Oregon, Washington and British Columbia forecasts that corridor traffic between Portland and Seattle would increase from its current base of two round trips per day (two other round trips are by long distance trains) to 15 round trips per day by 2015.

The state of Washington, Burlington Northern, Amtrak and the City of Kelso are pursuing the development of a multi-modal station at the downtown Kelso BN station. Rainier's proximity to the Longview-Kelso Amtrak station is therefore significant and likely to be more so in the future. High speed, convenient, reliable and relatively inexpensive passenger service in the Portland-Seattle corridor will be ever more valuable as vehicle traffic on I-5 gets more and more congested.

Water Transportation

There is currently no regularly scheduled water freight or passenger service to Rainier, despite the existence of numerous berthing facilities along the river within the City limits. The Port of Longview, on the north shore of the Columbia River, is a major industrial port and the Rainier community benefits from this economic activity in terms of jobs and in terms of the potential for development related to water transportation.

The Port of St. Helens has received regulatory approvals and funding commitments for the construction of a major marine terminal facility on the Rainier waterfront downstream of the Rainier-Longview bridge. Construction of the facility is not likely to begin until and unless there is a commitment by a major industrial company to lease its use. However, the fact that the facility is approved and that there are funding commitments may facilitate an industrial company locating on the Rainier waterfront in the near future. The marine terminal would provide for major freight transfer to and from Rainier. Projections of its use by steel fabrication corporation BHP were sufficient to support revenue bond payments for its construction, and presumably the same situation could well apply for other major industrial facilities.

Currently short trip cruise ships offer Portland-to-Astoria excursions. The possibility exists that Rainier could be a port of call on these excursions if appropriate facilities were provided.

Pipeline Transportation

Pipeline transportation in Rainier includes transmission for electricity, cable television, natural gas and telephone services. The OTP calls for the provision of a major natural gas pipeline between Portland and Astoria by the year 2012.

TRAFFIC OPERATIONS CONDITIONS

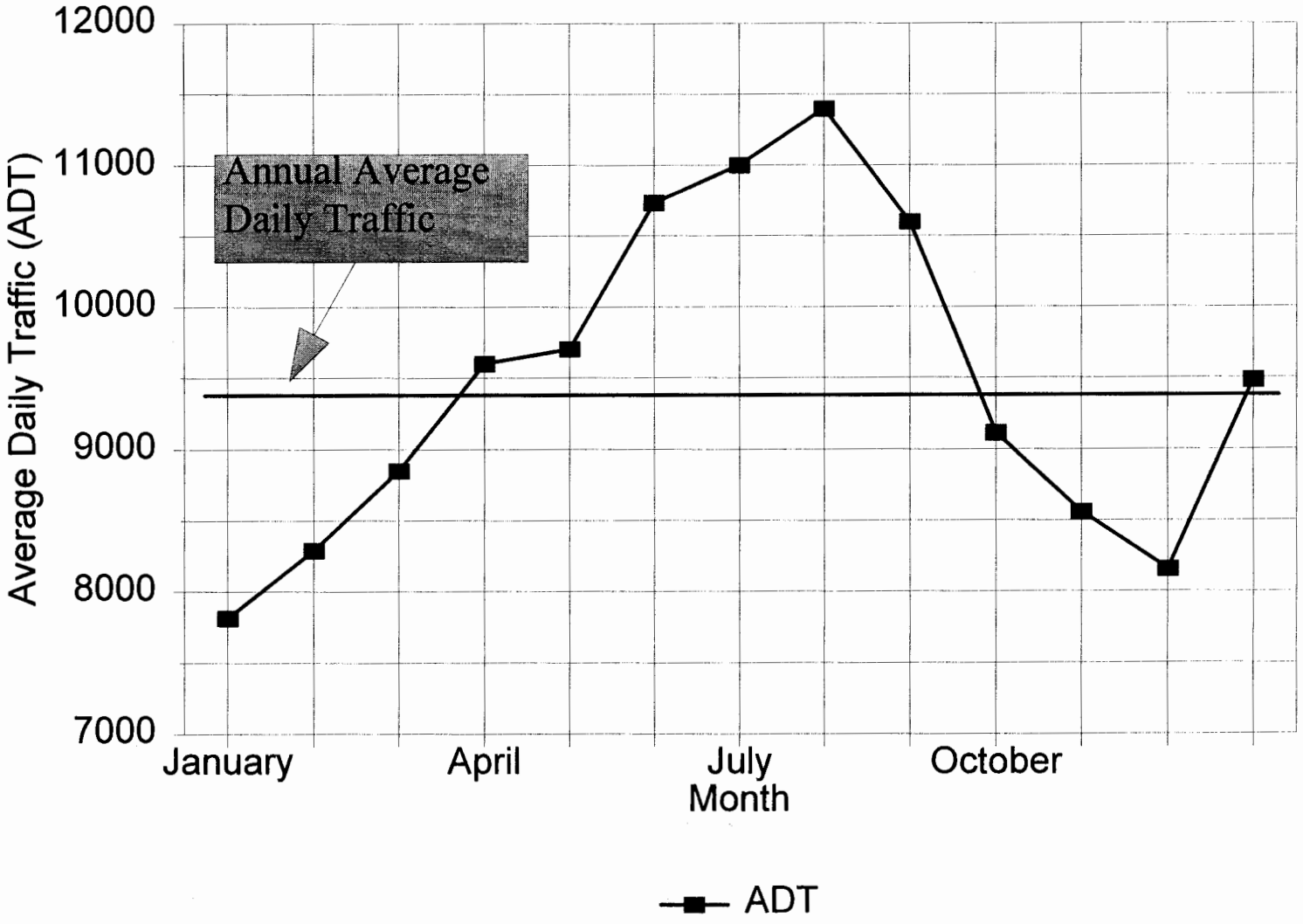
Manual turning movement counts were conducted at a total of nine study area intersections during the weekday p.m. peak period in April 1996. The study area intersections are shown in Figure 2 with information on intersection lane configuration and traffic control measures. There are just two signalized intersections in the study area -- on U.S. 30 at First Street and at Rockcrest Street. All other study area intersections are stop-controlled on either two or four approaches, except C Street/W Seventh Street which is stop-controlled on three approaches with the southbound uphill approach on Seventh Street uncontrolled.

The traffic counts were conducted between the hours of 3:30 p.m. and 6:00 p.m. on a Tuesday. The volumes counted were examined for reasonableness, and were also compared to other traffic volume data available for the area. The system peak hour for the study area was determined to occur between 4:30 and 5:30 p.m. To account for the difference in traffic volumes between April when the counts were conducted, and average weekday summertime conditions in July, the count volumes were subjected to a ten percent seasonal adjustment factor. This factor was determined from the records kept by the ODOT permanent recorder situated on U.S. 30 west of Rainier. Figure 3 shows the traffic fluctuations on U.S. 30. For study purposes, average weekday summertime peak hour conditions were considered. It is acknowledged that this does not represent the "peak of the peak" conditions - as for instance would be experienced during a peak summer weekend, but for long-range planning purposes, discussions with City and ODOT Staff indicated this to be an appropriate traffic level for planning of efficient facilities.

Figure 3

U.S. 30 Annual Profile

source: ODOT Permanent Recorder, 4 miles west of town, 1994 data



Level of Service Analysis

Using the peak hour traffic volumes described above, together with traffic control and lane configurations, peak hour intersection level of service analyses were performed for each of the study area intersections. Level of Service (LOS) is a concept developed by the transportation engineering profession to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. LOS is expressed as a letter grade ranging from "A" (little delay) to "F" (intolerable delay). Appendix C contains a detailed description of level of service. Figure 4 indicates the summertime peak hour turning movement traffic volumes used in the analysis.

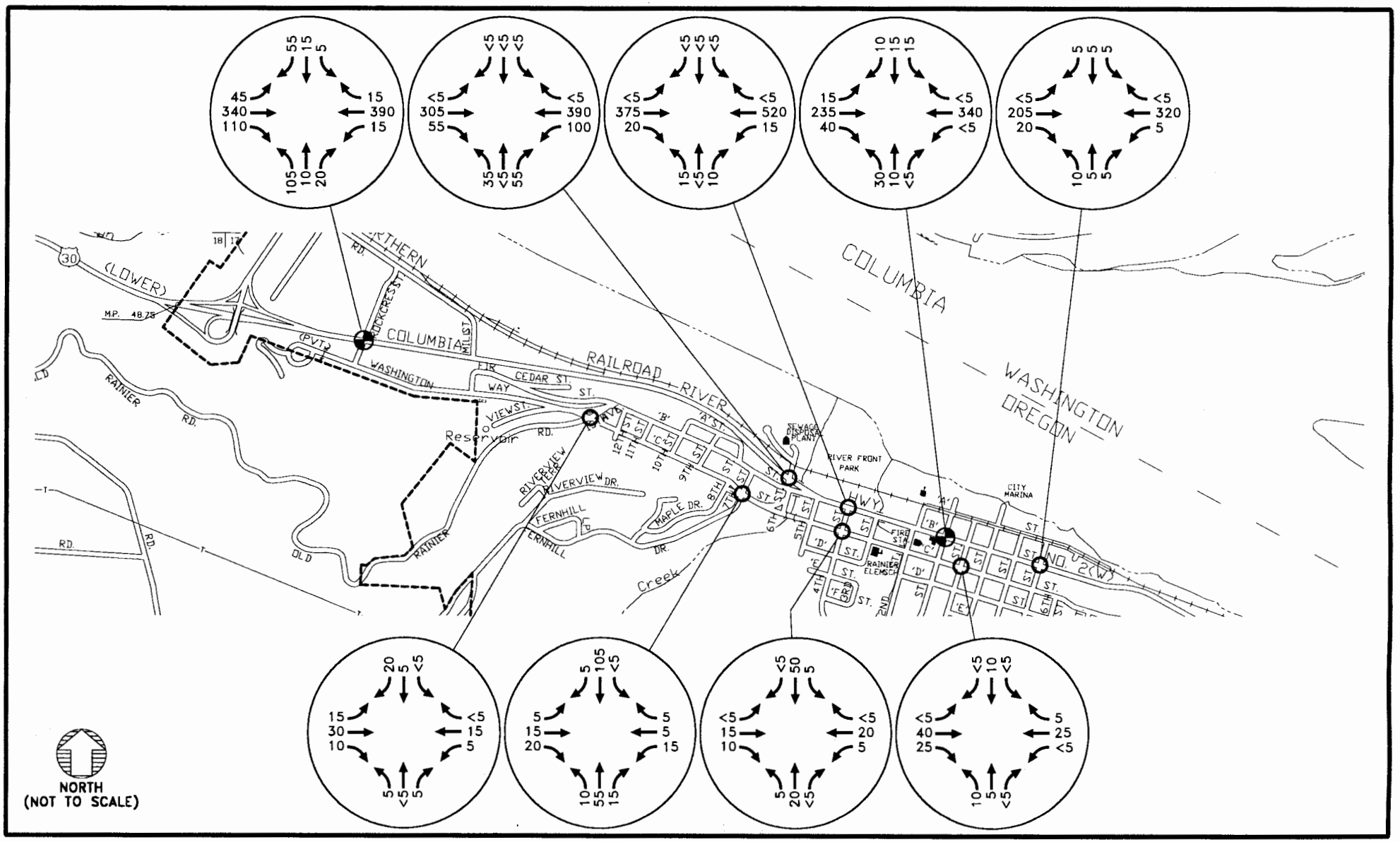
Table 3 summarizes the LOS analysis results for the nine study intersections. The Oregon Highway Plan (OHP) level of service standards stipulate minimum levels of service for design hour operating conditions through a twenty-year horizon for all state facilities. The service levels depend on level of importance and general land use characteristics. For a statewide highway such as U.S. 30 through an urban area, the minimum LOS is "C".

Table 3
Existing Intersection Level of Service Summary

Intersection	Delay/Vehicle (secs)	V/C	LOS
U.S. 30/E. Fifth Street	0.3		B
U.S. 30/First Street	3.0	0.37	A
U.S. 30/W. Fourth Street	0.5		C
U.S. 30/W. Sixth Street	1.5		C
U.S. 30/Rockcrest Street	11.5	0.58	B
C Street/E. Second Street	1.0		A
C Street/W. Fourth Street	1.8		A
C Street/W. Seventh Street-Fernhill Drive	2.1	0.286	A
C Street/Old Rainier Road	2.4		A

Shaded intersections are signal-controlled. All others are stop-controlled on the minor approach.

As shown in Table 3, all intersections currently operate at acceptable levels of service during the p.m. peak hour under average summertime weekday conditions. The two signalized intersections on U.S. 30 at First Street and Rockcrest Street are operating at level of service "B" and "A" respectively



LEGEND

- STOP SIGN CONTROL
- SIGNAL CONTROL

EXISTING (1996)
PEAK HOUR (4:30 – 5:30 PM)
TURNING MOVEMENTS

TRANSPORTATION SYSTEM STUDY RAINIER, OREGON SEPTEMBER 1997	FIGURE 4

1795VOLS

TRANSPORTATION SAFETY

Traffic Safety

An assessment of traffic safety conditions was conducted for U.S. 30 through Rainier using data obtained from the State covering the five-year period from January 1990 to December 1994. At intersections, the accident rate is given in terms of accidents per million entering vehicles (ACC/MEV) and is calculated by dividing the average number of accidents per year by the total entering vehicle volume for the year. An accident rate of less than 1.0 ACC/MEV generally indicates that there are no significant safety problems associated with the intersection. Along roadway segments, the total number of accidents is divided by the product of the roadway volume and segment length in miles. The result is reported as accidents per million vehicle miles traveled (ACC/MVM). Average accident rates in the State of Oregon for facilities similar to U.S. 30 through Rainier are approximately 3.55 ACC/MVM.

The safety analysis indicated that during the five-year study period there were 89 accidents reported along U.S. 30 between Rainier's east and west City limits. This equates to an average rate of 1.77 ACC/MVM (including intersection accidents) which is well below the statewide average of 3.55. Data revealed that, for the five-year review period, one fatality and one pedestrian accident were reported. The fatality occurred outside the City limits to the west of the Lewis & Clark Bridge interchange. It involved one vehicle which left the roadway at 10:00 a.m. without any reported cause. The reported pedestrian accident occurred in Rainier between Second and Third Street West at 7:00 pm during January. The pedestrian was attempting to cross the street and was struck by a vehicle traveling west on the highway. Analysis revealed driver and/or pedestrian error, and no obvious safety deficiencies.

At a meeting in Rainier to present the results of the preliminary safety analysis, it was reported to the project team that some safety data were omitted from the analysis. It was reported that since the cut-off date of the analysis (December 1994) there had been a serious pedestrian accident at the signalized intersection of First Street/U.S. 30. The accident involved a vehicle entering the highway from First Street striking a pedestrian crossing the highway with a green pedestrian signal. Analysis revealed the vehicle driver to be at fault for not yielding to the pedestrian in the intersection. It was also reported that there had, in the past, been a significant number of accidents at the intersection of U.S. 30 and W. Sixth Street. Review of state data revealed that three accidents were reported at this location during 1989 and were therefore not included in the analysis of 1990 to 1994 data. A further investigation was conducted to review City police department records which revealed that there were three accidents at this location in the three-year period 1993 to 1995. An accident rate of 0.29 ACC/MEV was computed.

Analysis results for individual intersections and roadway segments are presented in Table 4.

Table 4
Highway 30 Traffic Safety Analysis Summary

HIGHWAY INTERSECTION	No. of Accidents	Rate: ACC/MEV
E. Fifth Street	3	0.29
E. Third Street	6	0.55
E. Second Street	8	0.67
First Street	6	0.76
W. Second Street	9	0.62
W. Third Street	5	0.32
W. Fifth Street	5	0.30
W. Sixth Street	3*	0.29
Mill Street	2	0.10
Rockcrest Street	11	0.54
HIGHWAY SEGMENT	No. of Accidents	Rate: ACC/MVM
East City Limits to E. Fifth Street	4	0.37
E. Fifth to E. Second Street	0	-
E. Second to W. Second Street	1	0.97
W. Second to W. Fifth Street	0	-
W. Fifth Street to Mill Street	1	0.06
Mill Street to Rockcrest Street	1	0.27
Rockcrest Street to W. City Limits		

* During 3-year period.

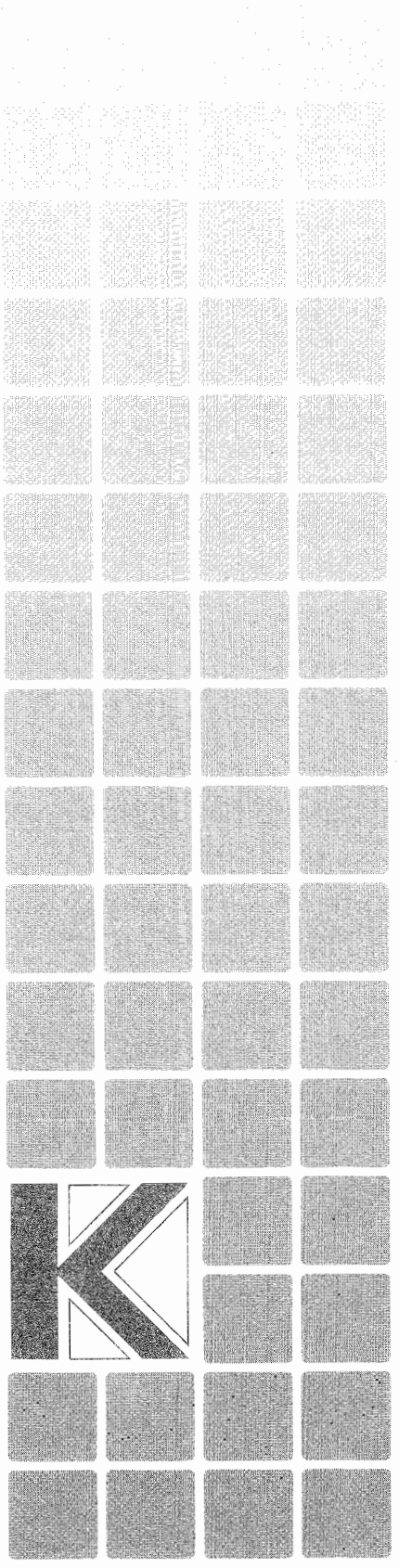
The results in Table 4 indicate that there are no intersections with an accident rate of 1.0 ACC/MEV or greater. The highest calculated accident rate is at First Street which experienced six accidents in a three-year period, with an accident rate of 0.76 ACC/MEV. A site visit at the location indicated no identifiable traffic hazards needing attention. This is not an unusually high rate, especially given that this is the first signal as motorists enter the City from the east making it somewhat susceptible to a higher that average accident rate. The next highest rate calculated was for E. Second Street which experienced 8 accidents in five years, with a rate of 0.67 ACC/MEV. The accident rates calculated for these Rainier intersections fall well below 1.0 ACC/MEV which is typically considered to reflect the lowest threshold for indicating an accident problem.

The safety results did not reflect the widely expressed opinion that the W6th/U.S. 30 intersection is a particularly hazardous location. Site inspection at the location indicated that some safety hazards

do exist - particularly in light of the high traffic volumes experienced at this location. Installation of a traffic signal when warranted at this location is a potential solution to this problem.
Similarly, for roadway segments, the highest accident rate calculated was for the segment between E. Second Street and W. Second Street which experienced a rate of 0.97 ACC/MVM. This rate is well below the statewide average for similar facilities (3.55 ACC/MVM), and no safety deficiencies are evident. The relatively high rate experienced in this area corresponds with the high-intensity land uses in this section, with numerous commercial properties situated along the highway in this section, compounded by on-street parking along the highway. Again, the rate in this section is well below thresholds which may indicate a safety deficiency.

Rail Safety

The Burlington Northern railroad runs down the center of A Street through the intersections of W. Second, First, and E. Second, Third, Fourth, Fifth and Sixth Streets, none of which have train-activated traffic control devices of any kind. A March 1995 report by Lancaster Engineering investigated safety records associated with the railroad, and concluded that there is currently a high level of safety despite the sharing of right-of-way. In the preceding 25 years, only five accidents involving a train were reported to the PUC. No injuries or fatalities occurred. This safety record seems to be a product of the slow (10 mph) train speeds and infrequent train movements. The report presents a number of alternatives for increasing crossing safety on A Street, but concludes that, unless train traffic is expected to increase significantly, it is not recommended that any improvements be implemented.



Section 3

Future Conditions and Alternatives Analysis

Future Conditions and Alternatives Analysis

INTRODUCTION

This section summarizes forecasted 20-year future transportation conditions in the City of Rainier. Comprehensive Plan population and employment growth projections were used to estimate future year travel demand. These traffic volume forecasts for the year 2015 are used to determine future traffic conditions on the existing roadway network in a no-build scenario. This analysis enables a determination of roadway system needs/requirements and is the starting point for the development of system improvement alternatives. Forecasted volumes are then assigned to the future network alternatives to enable a comparative analysis of the alternatives which in turn leads to the recommended or preferred alternative.

Apart from road traffic volume projections, alternative mode travel demand is estimated based on existing conditions and known improvement plans. This includes pedestrian, bicycle and transit travel as well as rail, air, water and virtual or electronic travel. The potential of these other modes for off-loading the roadway system is investigated.

The following topics are discussed in this section:

- Future Transportation Demand
- Future Land Use, Population and Employment projections
- Changing Demand for Transportation Options
- Future Automobile Traffic Growth
- Future No-build Alternative Traffic Operations Conditions
- Future Conditions for Pedestrian, Bicycle and Transit Modes
- Future Transportation System Alternatives
- Roadway System Elements

FUTURE TRANSPORTATION DEMAND

Future travel demand for the City of Rainier was estimated based on expected population and employment growth, and growth in traffic traveling through the area for the year 2016. The unique trip-making characteristics of residential and employment-based activities were considered in the development of future travel demand estimates.

Future Land Use -- Population and Employment

A number of sources exist for population projections for the Rainier Urban Growth Boundary (UGB) area, as tabled in the section on existing conditions. Portland State University estimated a 2015 population at 2,394 based in historic population trends in the City. After discussion with representatives of the City, it was decided to instead use Rainier's Comprehensive Plan population estimates in this analysis. Employment growth over the next twenty years was based on the existing jobs-to-housing ratio of 0.313 jobs per resident. Table 5 indicates the population and employment growth estimates used. Dwelling units were calculated using the 1990 census rate of 2.31 persons per household.

Table 5
Population and Employment Projections

Year	Population	Dwelling Units	Jobs
1995	1,720	745	539
2016	4,000	1,732	1,254

Comprehensive plan population growth indicated in Table 5 reflects a compound annual growth rate of 4.1 percent. By contrast, population growth forecast for the next twenty years by Portland State University based on historical trends is 1.4 percent. This compares with a growth rate of between 1.5 percent and 2.5 percent experienced by similar communities throughout Oregon. Thus, the growth assumed in this analysis may be considered relatively aggressive, based on this comparison with similar communities.

Changing Demand for Transportation Options

Travel demand 20 years from now is likely to consist of an increasing component of non-automobile traffic. The Rainier Comprehensive Plan includes specific provision for the pedestrian, bicycle, and transit modes as well as the automobile mode. In addition, such components as telecommuting and other "information super highway" technology will comprise an increasing part of the future transportation demand by the year 2016. Remote offices in people's homes and in commercial centers will allow employees to work via modems and other electronic links with offices any distance away; thus reducing the need to commute.

It is generally understood that as smaller rural communities grow in population and employment they become more self sufficient entities, better able to serve the full needs of their population. Citizens are able to find the employment and services desired within the community, instead of having to travel to larger urban areas located nearby. The benefit to the transportation system is in the potential for some of these trips (now local, not long distance) to be made via modes other than the automobile; thus reducing overall demand on the roadway network. A land-use plan that provides for the location of commercial centers near residential areas allows trips which would have otherwise been made via automobile (to the bank, dry cleaners, grocery store, video rental, etc.) to now be eligible to be made via some non-auto mode.

Generating quantitative future travel demand estimates for these "modes" is a challenging task. In addition, travel via these alternative modes is not traditionally constrained by capacity; rather it is more conventional to provide good access to these modes. Traditional methods of "extrapolation of trends" requires a basis in substantial historic data. Such data are not readily available for the Rainier area, or for communities of a similar size. Therefore, a qualitative approach was taken in estimating future demand and in developing alternatives which would address the expected demand.

Future Automobile Traffic Growth

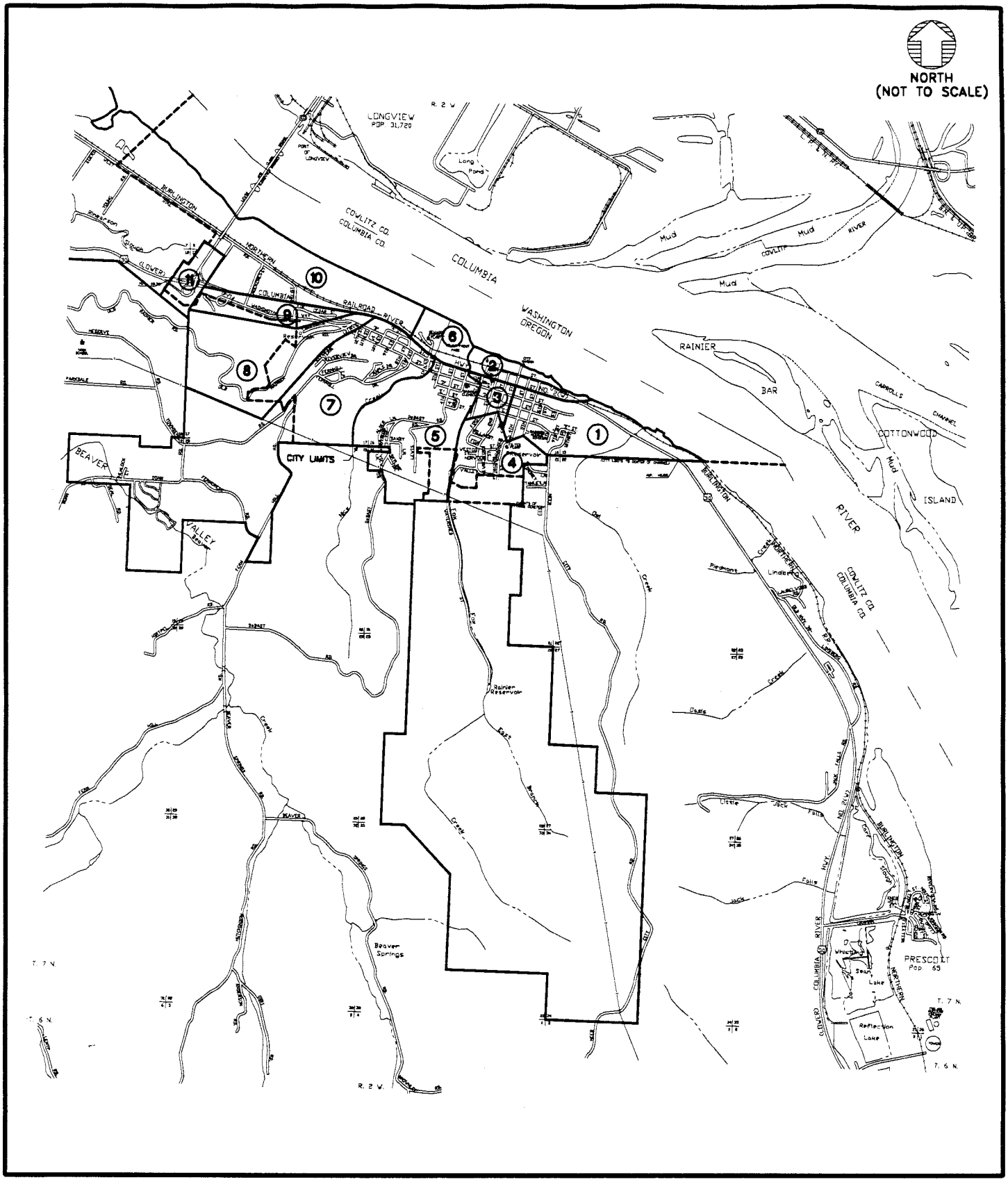
Internally Generated Trips
Future traffic growth was modeled by PSU's ODOT project team using the UFOSNET modeling package as part of their PDIA (Potential Development Impact Analysis) modeling for Columbia County. The traditional four-step modeling process - trip generation, distribution, mode split and assignment - is described in the project report *Potential Development Impact Analysis Phase III, Center for Urban Studies, Portland State University, July 15, 1995, and addenda.* Input to the model was number of dwelling units and number of employees by travel shed. Travel sheds are geographical areas for which all traffic is assumed to "drain" via one point to U.S. 30. For Rainier, ten internal travel sheds were delineated, and three external travel zones were added. Figure 5 shows the ten travel sheds developed by PSU for assigning new trips to the street network. The three external zones are: north and south on U.S. 30; and across the Longview Bridge into Washington. Output from the model is year 2016 peak hour traffic volumes on roadway links.

New dwelling units and jobs were allocated to the ten internal travel zones as shown in Table 6. This distribution of housing and employment growth was estimated by the planning staff of the City.

Modal split was not used - trip generation rates were private vehicle-trip based rather than person-trip based. Trip distribution and assignment were performed by the gravity model.

Future Through-Trips
Through trips are those with neither beginning nor end in Rainier but travel through the City without stopping, traveling on U.S. 30 and/or the Lewis and Clark Bridge. Historic trends in U.S. 30 traffic growth were used to estimate growth in through-trips over the next 20 years. Analysis of historical growth indicated wide ranges in annual traffic growth over the past 20 years. Analyses were conducted for two through-trip growth scenarios:

- Low Growth = 2.0 % per annum
- High Growth = 3.5 % per annum



LEGEND

(X) TRAVEL SHED NUMBERS

——— TRAVEL SHED BOUNDARIES

TRAVEL SHEDS

TRANSPORTATION SYSTEM STUDY RAINIER, OREGON SEPTEMBER 1997	FIGURE 5	K

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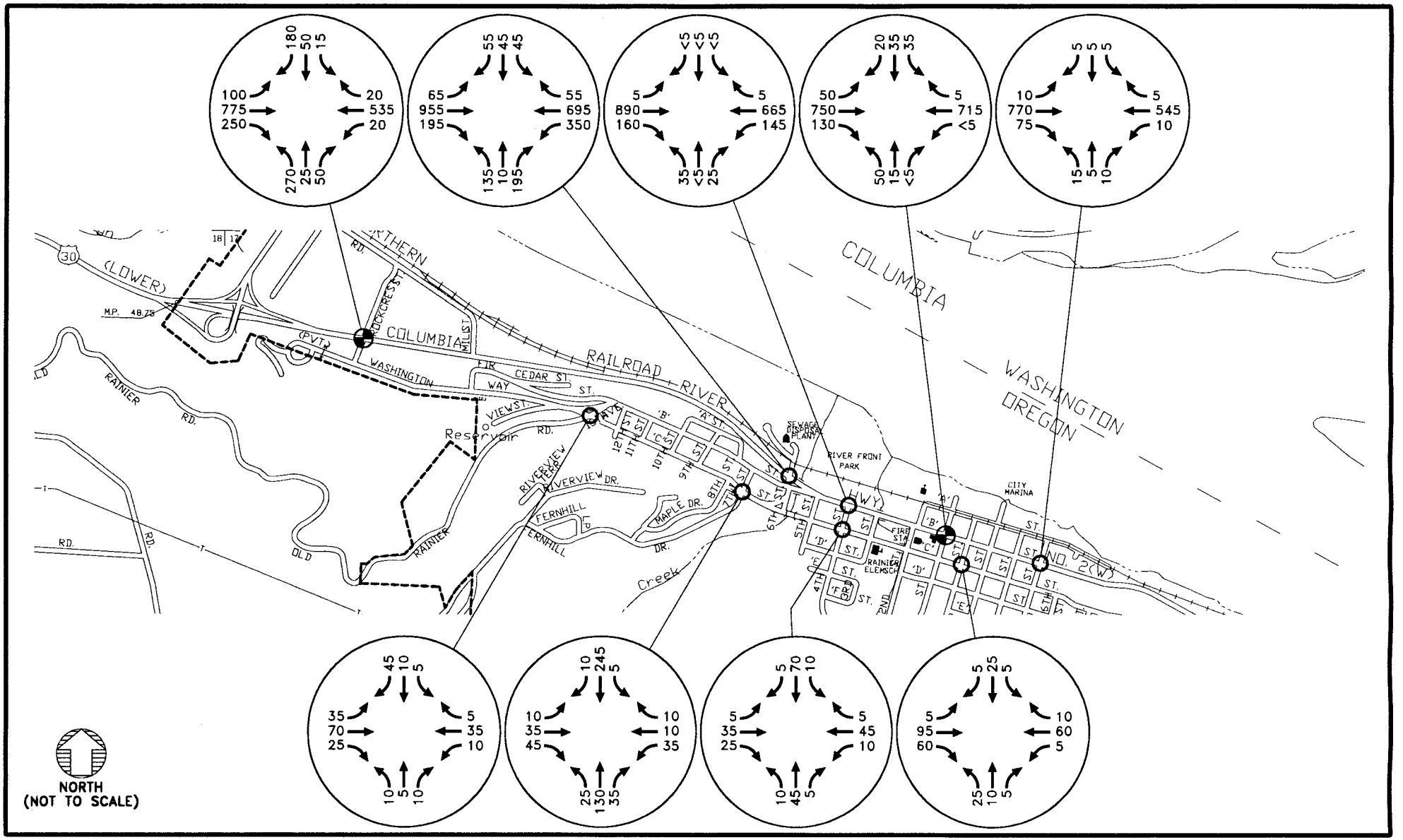
Table 6
Population and Job Growth by Travel Shed
1990 to 2016

Travel Shed	Dwelling Units			Jobs		
	Existing (1990) D.U's	% of new D.U.	Number of new D.U.	Existing (1990) Jobs	% of new Jobs	Number of new Jobs
1	146	12	118	46	0	0
2	30	1	10	321	6	44
3	32	0	0	149	0	0
4	110	5	49	0	0	0
5	121	14	138	75	0	0
6	0	0	0	0	0	0
7	192	49	484	42	4	29
8	38	16	158	0	0	0
9	23	3	30	30	4	29
10	32	0	0	97	86	627
Total	724	100	987	760	100	729

Future No-Build Alternative Traffic Operations Conditions

Results from the PSU travel forecasting model were used to determine year 2016 p.m. peak hour traffic operations conditions for the no-build case - i.e. assuming the current roadway system was still in place in the future. Model results indicated an increase in peak hour traffic volumes ranging between 25 percent and 200 percent depending on the location. Figures in Appendix D (UFOSNET Modeling Results) indicate a number of U.S. 30 links that would experience volumes exceeding capacity. For the low growth scenario, volume would exceed capacity on only three links -- the southbound-to-westbound ramp on the Lewis & Clark bridge, and on U.S. 30 between W. Sixth Avenue and W. Fifth Avenue. For the high-growth scenario, capacity is exceeded southbound on the Lewis & Clark bridge and on the southbound-to-westbound ramp, as well as on eight links on U.S. 30 eastbound between W. Sixth Avenue and E. Fourth Avenue.

For intersection operations, growth rates for individual links in the model were used to factor the existing summer conditions peak hour traffic turning movement volumes, and an analysis was conducted to determine "no build" peak hour traffic operations for study intersections. The analysis was conducted for Scenario 3 (which assumes a 3.5% highway through-growth.) Conditions were checked assuming the low growth scenario but were found to be very similar to those for the high growth scenario which was then used to ensure a conservative result. The p.m. peak hour turning volumes used in the analysis are shown in Figure 6.



LEGEND

- STOP SIGN CONTROL
- SIGNAL CONTROL

2015 SUMMERTIME PEAK HOUR (4:30 – 5:30 PM) TURNING MOVEMENTS

TRANSPORTATION SYSTEM STUDY RAINIER, OREGON SEPTEMBER 1997	FIGURE 6

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A level of service analysis was conducted to evaluate the 2016 pm peak hour traffic operations for the study intersections. The level of service results for these intersections are shown in Table 7 and have been prepared in accordance with the procedures presented in the *1994 Highway Capacity Manual Transportation Research Board*. Appendix C contains a detailed description of level of service. Level of service D or better is generally considered an acceptable level of service for signalized intersections and level of service E or better is generally considered acceptable for unsignalized intersections.

Table 7
2016 Intersection Level of Service Summary (Unmitigated)

Intersection	V/C	Avg. Delay (secs)	Critical Movement	LOS
Signalized Intersections				
U.S. 30/First Street	1.17	*		OC**
U.S. 30/Rockcrest Street	1.64	*		OC
Unsignalized Intersections				
U.S. 30/E. Fifth Street		59.5	NB LTR	F
U.S. 30/W. Fourth Street		*	NB L/T	F
U.S. 30/W. Sixth Street		*	SB LTR	F
C Street/E. Second Street		4.7	NB LTR	A
C Street/W Fourth Street		4.6	WB LTR	A
C Street/W. Seventh Street-Fernhill Drive	0.59	4.8		A
C Street/Old Rainier Road		3.9	WB LTR	A

Shaded intersections are signal-controlled. All others are stop-controlled on the minor approach.
* Delay exceeds tolerable limits.
** Over capacity.

As shown in Table 7, the two existing signal locations will no longer operate at acceptable levels of service in 2016 given the City's Comprehensive Plan population and employment growth assumptions. This likely indicates the need for increased approach lanes at these locations. In addition, the remainder of the unsignalized study intersections on U.S. 30 will no longer operate at acceptable levels of service. This may indicate the need for signalization at one or more of these locations. The results do, however, indicate that capacity deficiencies are restricted to the U.S. 30 corridor, and that all four stop-controlled intersections on C Street will continue to operate at LOS "A" in 2016 for Comprehensive Plan growth.

Future Conditions for Pedestrian, Bicycle and Transit Modes

Future demand for pedestrian and bicycle transportation was qualitatively estimated. Pedestrian trips are possibly the least quantifiable, and the most difficult to predict. There are numerous trips made using this mode in Rainier on a daily basis, but there is also a great opportunity for increasing the number of pedestrian trips made in place of automobile trips for various activities, particularly shorter trips.

The means to promote this mode lies in providing safe and efficient facilities for the use of residents, in particular connecting the pedestrian trip generators. These include sidewalks along all collector and arterial streets that will connect the elementary and middle schools, the library, the commercial district and the waterfront area including the City Park with residential nodes.

As mentioned in the existing conditions memorandum, there was relatively little bicycle activity observed within Rainier during data gathering exercises. No counts were taken to quantify the level of activity and there is no historic data, so it is not possible to project current "traffic" into the future. Rather, estimates of future bicycle travel are based on the anticipated number of people, combined with assumptions on mode-split based on national data, as well as the location of bicycle trip-generators which include such uses as schools, library, City Park, commercial centers and residential areas. It is recognized, however, that the severe topography in Rainier restricts bicycle travel.

The objective of the preliminary bicycle plan is to put in place a continuous system that links the primary trip generators in a manner that is attractive to cyclists for use as an alternative to making an automobile trip, and is safe. These elements may consist of posted routes, on-street bike lanes, and separated bicycle trails.

FUTURE TRANSPORTATION SYSTEM ALTERNATIVES

Roadway System Elements

Using the results of the "no-build" traffic operations analysis, a number of alternative roadway improvement plans were investigated.

The forecasting model was modified to include the proposed A Street extension between Rockcrest Street and the existing terminus of A Street downtown. Figures in Appendix D indicate these modified results for low and high growth scenarios. For the low growth scenario, there are no links on U.S. 30 which exceed capacity, while for high growth, there are three links shown to exceed capacity. This is in the section to the east of the new A Street connection where providing parallel alternative routes is made extremely difficult due to the terrain. Capacity on U.S. 30 in this section can be enhanced through the removal of on-street parking and application of access management policies.

For peak hour operations at study intersections, level of service results are shown in Table 8. These results reflect needed traffic management improvements at the signalized intersections and include the installation of a traffic signal at the U.S. 30/W Sixth Street intersection.

Table 8
2016 Intersection Level of Service Summary (Mitigated)

Intersection	V/C	Avg. Delay (secs)	Critical Movement	LOS
Signalized Intersections (Mitigation)				
U.S. 30/First Street (1)	0.70	23.3		UC**
U.S. 30/W. Sixth Street (2)	0.55	13.3		UC
U.S. 30/Rockcrest Street (3)	0.75	29.7		UC
Unsignalized Intersections				
U.S. 30/E. Fifth Street		59.5	NB LTR	F
U.S. 30/W. Fourth Street		*	NB L/T	F
C Street/E. Second Street		4.7	NB LTR	A
C Street/W Fourth Street		4.6	WB LTR	A
C Street/W. Seventh Street-Fernhill Drive	0.59	4.8		A
C Street/Old Rainier Road		3.9	WB LTR	A

Shaded intersections are signal-controlled. All others are stop-controlled on the minor approach.
(1) Provide left-turn lane and protected/permissive phasing.
(2) Install traffic signal.
(3) Provide protected phasing on minor street approaches.
* Delay exceeds tolerable limits.
** Under capacity

As shown in Table 8, acceptable peak hour operating conditions can be restored at the majority of study area intersections with some road improvements. Two exceptions are U.S. 30/E Fifth Street and U.S. 30/W Fourth Street. Also, a signal is required to provide acceptable level of service at U.S. 30/W Sixth Street and a signal warrant evaluation confirmed that a signal at this location will be warranted by 2016.

The F level of service at U.S. 30/W Fourth Street indicates that a motorist desiring to perform a northbound left-turn movement would experience long delays in finding an acceptable gap in the U.S. 30 traffic stream. Signal warrant calculations indicate that a signal would not be warranted at this location during the next twenty years. Furthermore, the vehicles making this movement have a reasonable alternative. With a signal provided at W. Sixth Street, vehicles which encounter a high level of delay at W. Fourth Street could use C Street to travel to the signal at W. Sixth Street where they would be served by the signal and encounter a great deal less delay. It should be noted that deficient traffic operations conditions at this location would only occur during 1 to 2 hours per day in the summertime, with acceptable operations during the remainder of the day without a signal. Thus, given that the need for a signal or other mitigation is relatively low, and that there are other

options for drivers, it probably would not be prudent to impose delay on U.S. 30 traffic with the installation of a signal at this location.

The situation at E. Fifth Street is similar in that left-turning vehicles could use the signal at First Street, although it is four blocks away, as well as the other unsignalized streets between E. Fifth and First Streets. These alternatives which exist would reduce the "point load" at E. Fifth Street and likely return that intersection to an acceptable level of service. Signal warrants indicated that a signal would not be warranted at this location over the next twenty years. It should also be noted that the analysis conducted for the low growth scenario indicated that this location would operate at an acceptable "D" level of service.

Alternatives Analysis

The nature of the potential solutions to transportation problems in the City of Rainier are such that an extensive theoretical alternatives analysis was not warranted. As already mentioned, the travel demand forecasting model was utilized to analyze the impacts of constructing A Street between its current terminus at W. Second Street and Rockcrest Street as opposed to relying only on U.S. 30 for this demand. There were three other alternatives analyzed without the use of the model.

C Street/Fernhill Drive Intersection

The topographical constraints that affect the development opportunities for Rainier dictate that much of any future development will occur in the Beaver Valley area. Access to this area from the downtown area and U.S. 30 is provided primarily via Fernhill Drive which accesses the highway at the unsignalized intersection at W. Sixth Street. This is the likely location of a future signal, but the connection between this intersection and Fernhill Drive involves traffic using B Street and W. Seventh Street which routes a significant amount of traffic through a residential area. Furthermore, this heavy north-south movement will eventually limit the east-west capacity of C Street which provides a parallel alternative to U.S. 30 to the west of town. A number of alternatives were briefly reviewed for adding capacity and routing traffic out of the residential area.

1. The most effective solution in terms of capacity is the Nice Creek alignment that would re-route Fernhill Drive alongside the Nice Creek under the C Street Bridge. A connection would be provided to C Street via an intersection with W. Seventh Avenue. This alternative would be most costly and would inevitably run into significant environmental complications.

2. The Direct Fernhill alignment option would realign Fernhill Drive directly down the hill to the W. Sixth Street/U.S. 30 intersection. This would necessitate acquiring some right-of-way and the relocation of some businesses and residences along W. Sixth Street between B and C Streets. This alternative would also be expensive and may require condemnation of property. A capacity issue would remain at the Fernhill Drive/C Street intersection.

3. The most likely alternative would be a refinement of the current alignment with some traffic engineering improvements to increase the turning radius at the intersection of B Street and W. Seventh Street. Right-of-way acquisition, relocation and construction cost would be minimized while simultaneously greatly improving the alignment for the major traffic flow. The alternative does not

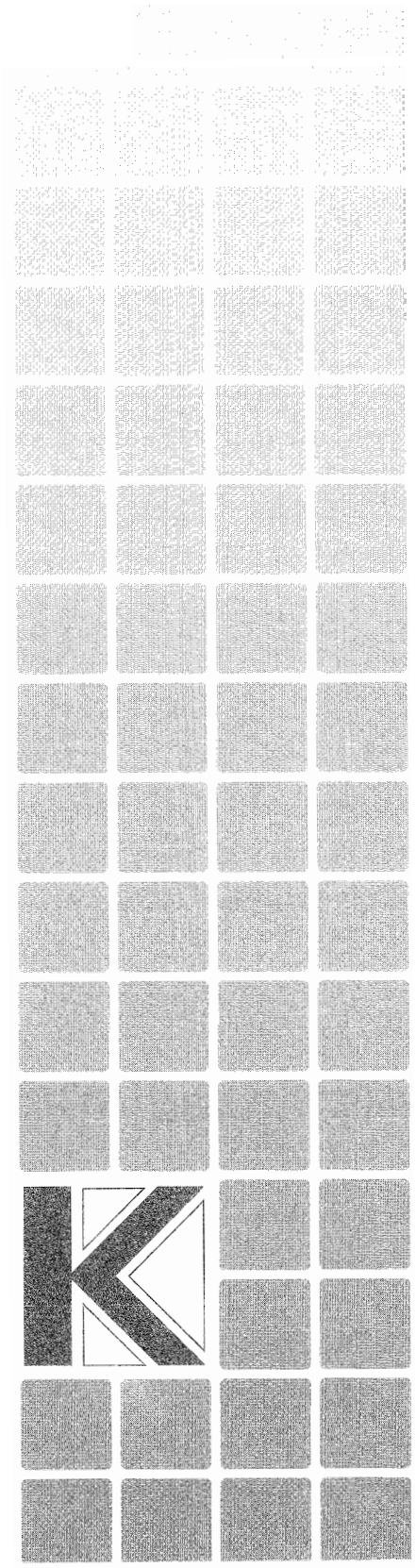
address the problem of traffic in a residential area, nor does it improve capacity at the intersection of C Street/W Seventh Street. It is nevertheless the recommended option, because of the negative economic and environmental impacts of the other two alternatives.

"Powerline Road" Connection

A potential alignment exists which could provide a connection between the Rockcrest area and the new development area in Beaver Valley. The potential "Powerline Road" connection would provide a direct route between Fernhill Drive and the Lewis & Clark bridge to allow for movement of traffic bound for Longview. Development of the Powerline Road route would minimize the need for capacity improvements at the C Street/W Seventh intersection by providing an alternative route.

Downtown Parking Options

The potential capacity problem at the First Street/U.S. 30 intersection may require removal of on-street parking on U.S. 30 in the heart of Rainier, especially if population and employment levels grow as per the Comprehensive Plan together with the "U.S. 30 high growth" scenario are realized. Potential replacement strategies include the development of surface parking lots where vacant land currently exists. One such lot exists at the corner of A Street/E Second Street. Other sites may be available within the downtown core.



Section 4

Transportation System Plan

Transportation System Plan

INTRODUCTION

This section describes the individual elements which comprise the Transportation System Plan for the City of Rainier. The plan addresses needed improvements in the following categories:

- Roadway Plan
- Pedestrian Plan
- Bicycle Plan
- Transit Plan
- Rail Plan
- Air/Water/Pipeline Plan

Projects associated with each plan element have been identified and costs have been estimated for their implementation. In addition, each of the improvement elements has been prioritized for implementation timing purposes. Each project has been allocated to either the 1 to 10-year or 11 to 20-year time frame, and project costs have been separated into the two decades for the purposes of the transportation finance plan (discussed in the following section).

ROADWAY PLAN

Roadway Functional Classifications

The purpose of classifying roads within the study area is to provide a balanced transportation system that facilitates mobility for all modes at acceptable levels of service, while also providing sufficient accesses to adjacent land uses and ensuring neighborhood livability. Currently, the City of Rainier does not have a roadway classification system in effect.

In order to classify roadways in the study area, existing and proposed facilities need to be examined to determine the level of land use and resulting transportation demand served. The facilities must be able to accommodate various modes of travel which include primarily passenger vehicles, heavy trucks, pedestrians, bicycles. The facilities must also provide utility corridors (electricity, gas, telephone, cable, water etc.) to serve adjacent land uses. The functional purpose for each classification is described below:

Arterial Streets: The primary function of arterials is to provide through-movement to traffic, distributing it to collector streets and providing limited land access in order to minimize interruption to the arterial traffic. These streets are characterized by a three- to five-lane roadway section. Pedestrian and bicycle pathways should be provided on all arterial facilities. Signalization should be provided at intersections with other arterials and with collector streets, as warranted.

Collector Streets: The primary function of collector streets is to move traffic between arterial facilities and local streets, and to provide access to adjacent land uses. Collector streets area characterized by two or three lane roadway sections. Bike lanes should be provided where average

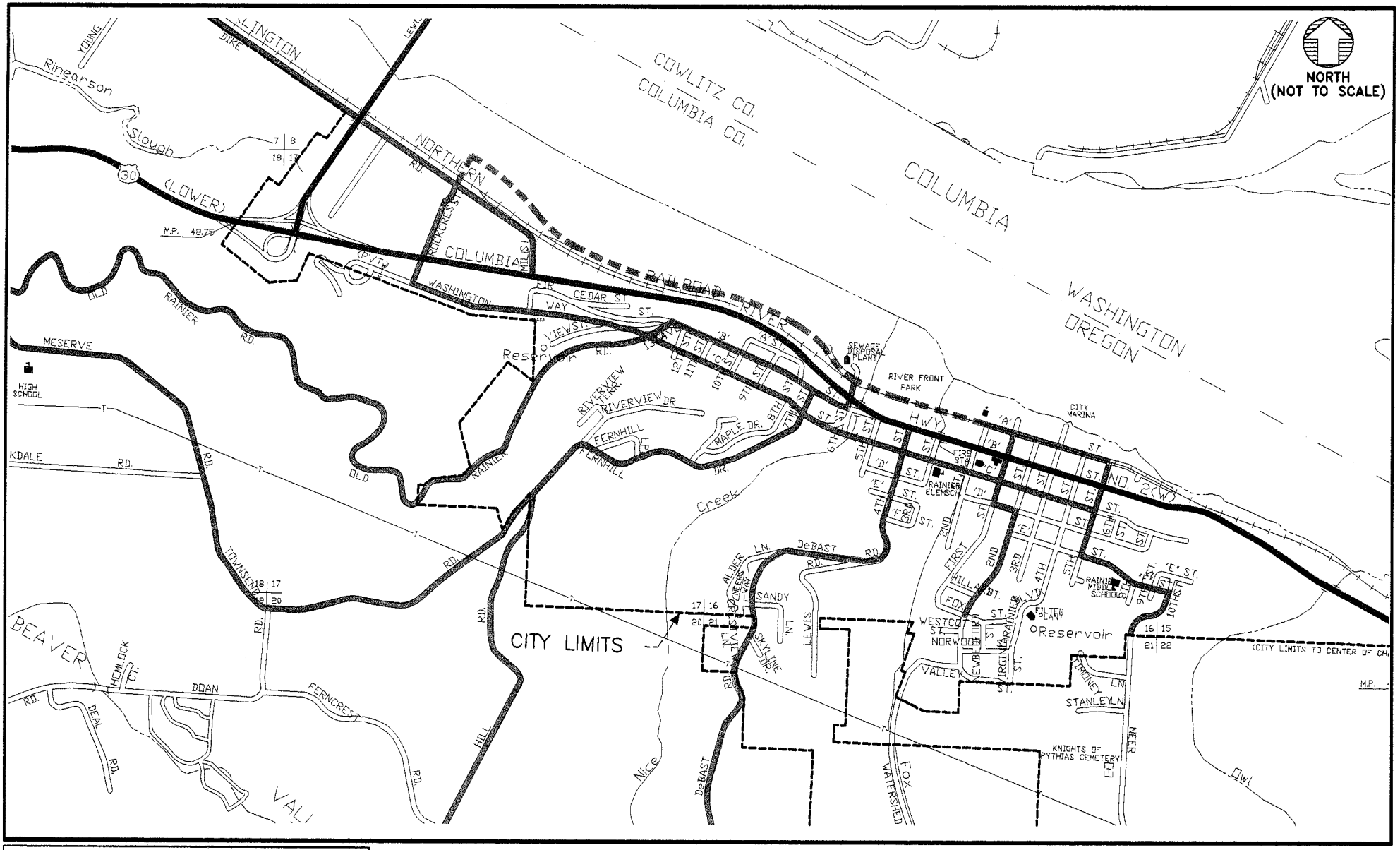
daily traffic volumes exceed 3,000 vehicles per day (vpd) or where the collector street directly connects to a land use which generates significant bicycle traffic (e.g. a school or park). Continuous sidewalks should be provided on both sides of all collector streets. Intersections with other collectors and arterials may be signalized if warranted.

Local Streets: The function of local streets is to provide local access to private dwellings and businesses. The local street is characterized by two travel lanes, with on-street parking typically provided on one or both sides. Local streets should serve primarily passenger cars, pedestrians and cyclists, and forms part of the residential community space. Heavy truck traffic should be discouraged.

Figure 7 and Table 9 show the roadway functional classification system.

Table 9
Arterial/Collector Roadway System

Functional Classification	Road Name
Arterial Streets	B Street
	U.S. 30
	Lewis & Clark Bridge
Collector Streets	C Street
	Washington Way
	A Street
	First Street
	W. Seventh Street
	W. Fourth Street
	E. Second Street
	E. Fifth Street
	Rockcrest Street
	Mill Street
	Dike Road
	Old Rainier Road
	Fernhill Drive
	DeBast Road
Local Streets	All others in Rainier



LEGEND

- PROPOSED ARTERIAL STREET
- PROPOSED COLLECTOR STREET
- FUTURE COLLECTOR STREET
- CITY LIMITS

ARTERIAL/COLLECTOR PLAN

TRANSPORTATION SYSTEM STUDY RAINIER, OREGON SEPTEMBER 1997	FIGURE 7	K

1795PLOS

Roadway Design Standards

Roadway design standards are based upon the functional and operational characteristics of streets including travel volume, capacity, operating speed and safety. They are necessary to ensure that the system of streets, as it develops, will be able to safely and efficiently serve the traveling public, and allow for the orderly development of adjacent lands, and the transportation infrastructure serving that land.

Roadway design standards should consist of the following parameters in order to conform with generally accepted practice:

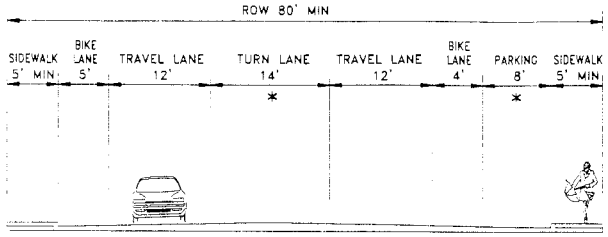
- Typical Roadway Section
- Alignment and Operational Characteristics
- Access Management

In 1997, Columbia County developed and adopted new roadway standards which address each of the above parameters. The City of Rainier will use the adopted County standards for all new streets and road upgrades with possible exceptions in specific cases.

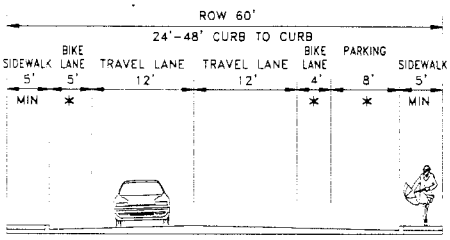
Figure 8 shows Rainier's roadway cross-section standards for arterial, collector and local streets. The only arterial within the City is U.S. 30, a State facility, so the standards shown are the State's standards. Collector and local street standards are based on the new Columbia County Standards. In both cases, the cros- sections shown are intended for roadways where right-of-way is unconstrained. However, the topography in Rainier means that there are few instances where this is the case.

Figures 9 through 13 show roadway cross-section alternatives that have been developed as part of this study for downtown sections of U.S. 30 where buildings constrain the right of way. These "downtown plans" enhance conditions for pedestrians and cyclists on the highway with wider sidewalks and bike lanes. These figures show sidewalk and streetscape improvements that will enhance the vitality of the downtown. Some fundamental objectives of the program include:

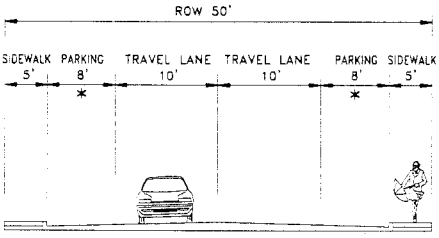
- Improving pedestrian safety and comfort with curb extensions, special paving at cross walks.
- Enhancing the pedestrian environment by providing streetscape amenities, continuous sidewalks, planters, and appropriate scale.
- Providing improved pedestrian connections to waterfront



2/3-LANE ARTERIAL
(* OPTIONAL)



COLLECTOR
(* OPTIONAL)



LOCAL (RESIDENTIAL)
(* OPTIONAL)

ROADWAY STANDARDS

TRANSPORTATION SYSTEM PLAN RAINIER, OREGON SEPTEMBER 1997	FIGURE 8	K

1795ROAD

COLUMBIA RIVER

REFER TO RAINIER WATERFRONT URBAN RENEWAL PLAN FOR PROPOSED IMPROVEMENTS IN THIS AREA

CONTINUE STREETSCAPE IMPROVEMENTS INTO WATERFRONT IMPROVEMENT AREA

CREATE RAILROAD SEPARATION, SUCH AS RUMBLE STRIP

A STREET, TYP.

CONVERT EXISTING ANGLE PARKING TO PARALLEL

ENLARGE PEDESTRIAN AREAS AT INTERSECTIONS

DEFINE AND ENHANCE VEHICULAR ENTRIES INTO PARKING AREAS

ENHANCE STREETSCAPE BY PROVIDING STREET TREES, BENCHES, TRASH RECEPTACLES, BIKE RACKS AND OTHER PEDESTRIAN AMENITIES

ENHANCE AND/OR CREATE PEDESTRIAN CONNECTIONS BETWEEN PARKING AREAS AND STREETSCAPES

TYP. N/S STREET

TYP. N/S STREET WITH ANGLE PARKING

TYP. N/S STREET WITH STEEP GRADIENT

LIMIT VEHICULAR ACCESS CONNECTIONS BETWEEN PARKING AREAS AND HWY 30

EXISTING PARKING AREA, TYP.

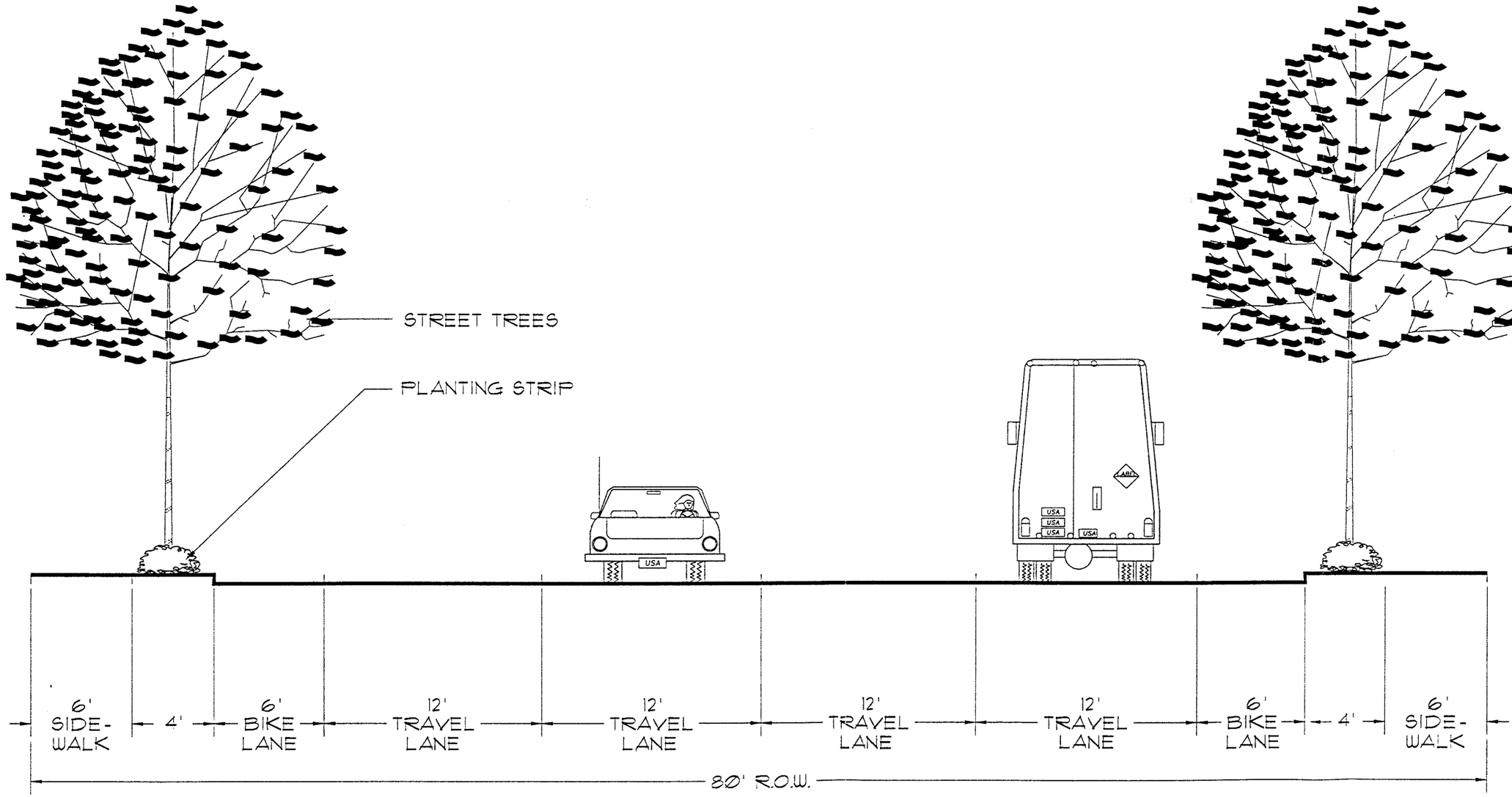
ENHANCE AND/OR CREATE PARKING AREAS TO MITIGATE LOSS OF ON-STREET PARKING

CREATE CONTINUOUS SIDEWALK WHERE NONE EXISTS

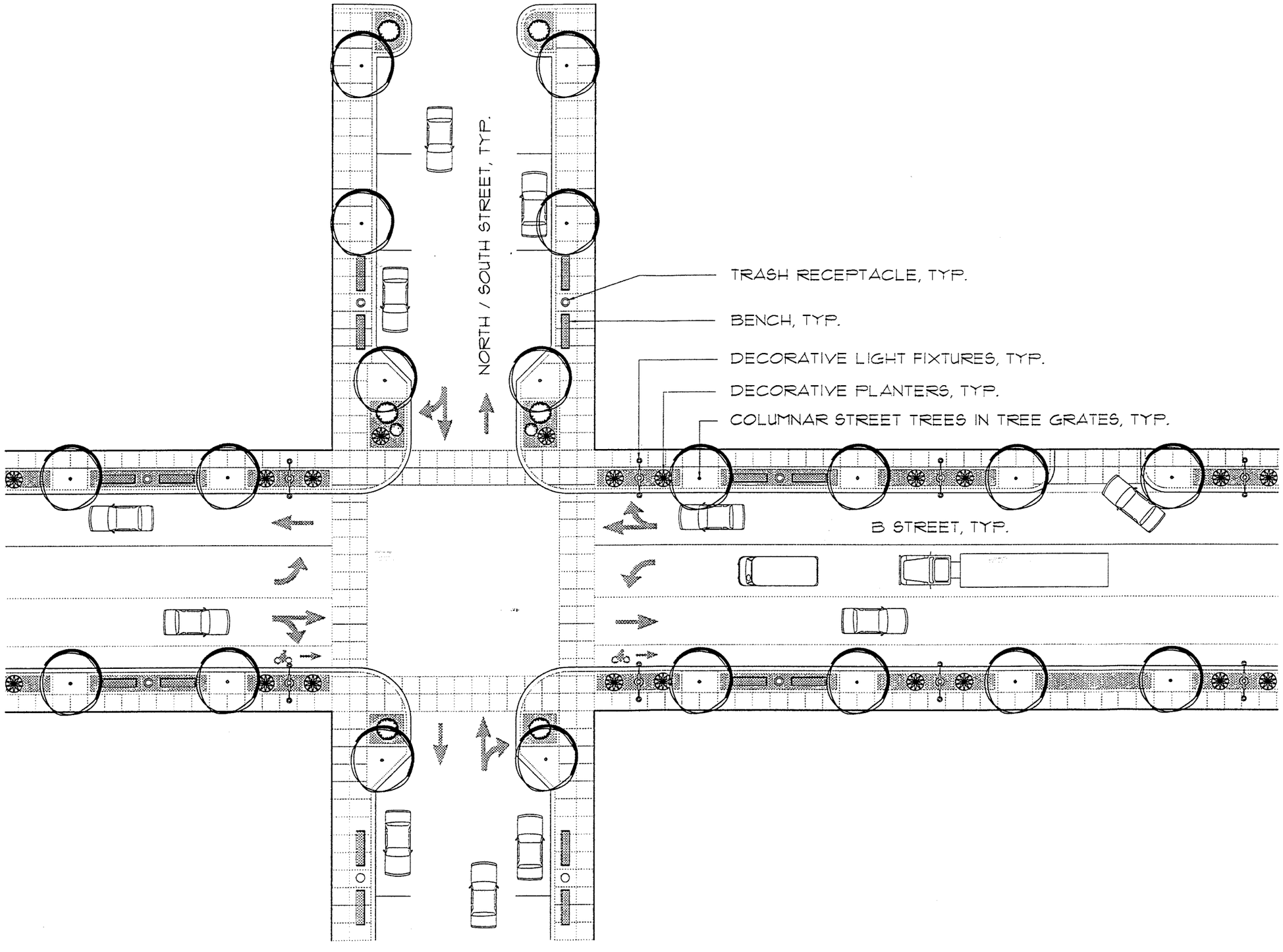
B STREET (HWY 30), TYP.

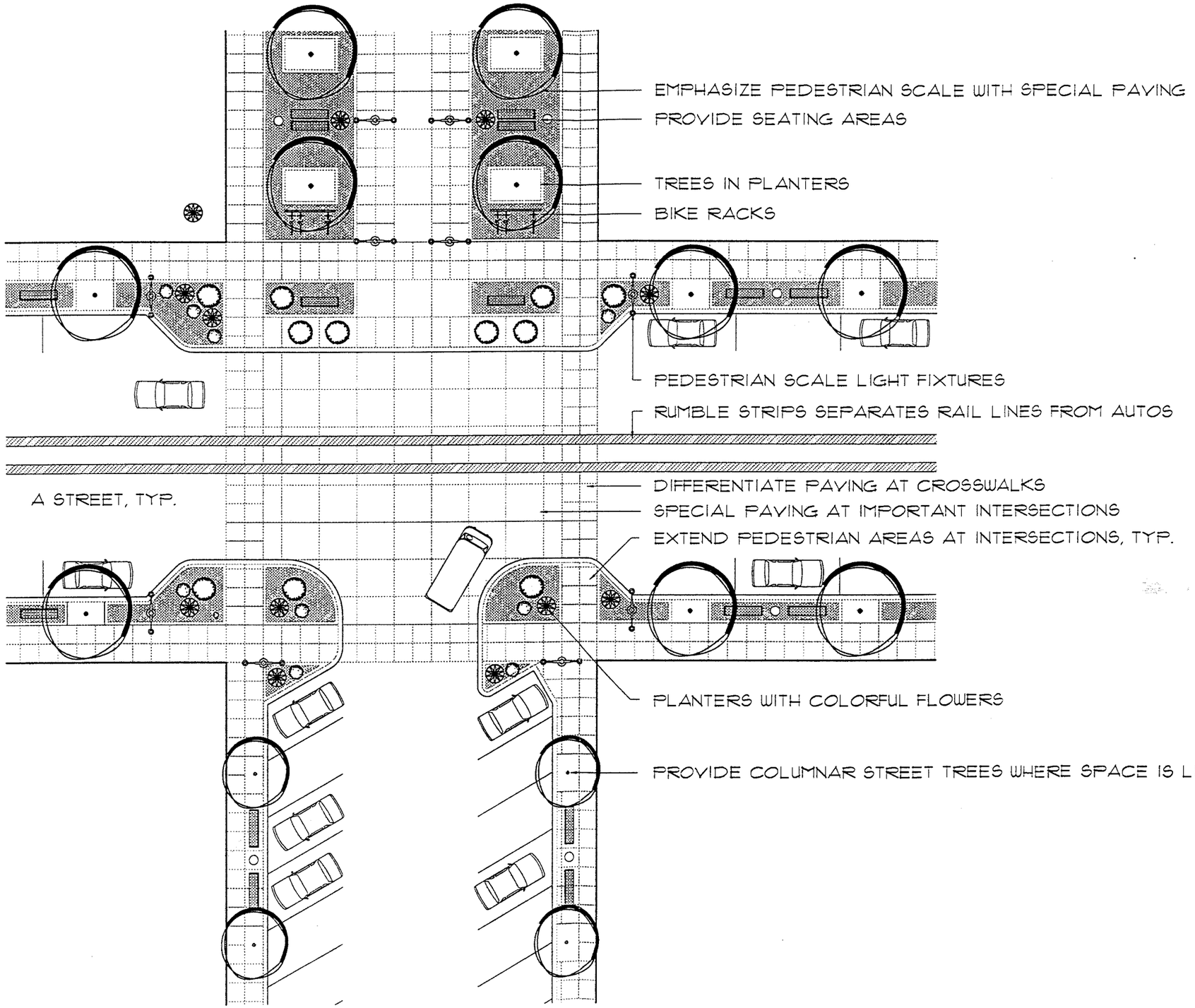
CONSIDER SPECIAL PAVING AT MAJOR INTERSECTIONS

DEFINE CROSSWALKS, TYP.



HIGHWAY 30 / B STREET SECTION
(WEST SEGMENT)


NORTH / SOUTH STREET, TYP.
TRASH RECEPTACLE, TYP.
BENCH, TYP.
DECORATIVE LIGHT FIXTURES, TYP.
DECORATIVE PLANTERS, TYP.
COLUMNAR STREET TREES IN TREE GRATES, TYP.
B STREET, TYP.


EMPHASIZE PEDESTRIAN SCALE WITH SPECIAL PAVING
PROVIDE SEATING AREAS
TREES IN PLANTERS
BIKE RACKS
PEDESTRIAN SCALE LIGHT FIXTURES
RUMBLE STRIPS SEPARATES RAIL LINES FROM AUTOS
DIFFERENTIATE PAVING AT CROSSWALKS
SPECIAL PAVING AT IMPORTANT INTERSECTIONS
EXTEND PEDESTRIAN AREAS AT INTERSECTIONS, TYP.
PLANTERS WITH COLORFUL FLOWERS
PROVIDE COLUMNAR STREET TREES WHERE SPACE IS LIMITED

A STREET, TYP.

Roadway Improvement Plan

Street improvement projects which make up the roadway plan element are shown in Figure 14.

1. A Street - A Street is to be extended from its current terminus west of W. Second Street, parallel to and north of the railroad (i.e. the new section will not straddle the railroad). Traffic will cross the railroad again at a new northward extension of Rockcrest Street where traffic currently crosses the tracks at the lumber yard. The facility will have a three-lane basic section with bicycle lanes but no on-street parking. A planted center median could be provided in places to enhance A Street as a Boulevard. This improvement is scheduled for the first decade.

2. C Street Improvements - Along with the proposed extension of A Street, C Street will provide a needed parallel alternative to B Street to the south. This route will be enhanced to make it more attractive for local trips -- particularly school-related and shopping trips that might otherwise use the highway. Potential enhancements will include: resurfacing, curb and sidewalk replacement in sections where they have deteriorated, vertical curve improvements and curb radius improvements. This improvement is scheduled for the second decade.

3. C Street Bridge - As part of the plan to enhance C Street as an attractive alternative route to U.S. 30 for local trips, this bridge is to be upgraded to a two-lane structure with provision for bicycles and pedestrians. Replacement of the bridge may be necessary. This improvement is scheduled for the second decade.

4. C Street/W Seventh Street - The current alignment will be refined, with improvements to the intersection of C Street/W Seventh and improved curve radii for through-traffic between Fernhill Road and U.S. 30. This improvement is scheduled for the second decade.

5. First Avenue Signal Improvements - The traffic signal at B Street/First Avenue will require upgrading to provide protected-permissive left-turn phasing. This improvement requires the provision of a dedicated center left-turn lane for storage at the intersection. Existing pavement and right-of-way constraints at this location indicate that provision of a left-turn lane will require the removal of parking on both sides of the street for a distance of approximately 500 feet either side of the intersection. This improvement is scheduled for the second decade.

6. W. Sixth Avenue Signal - A signal will be warranted at the intersection of U.S. 30/W Sixth Street due to traffic growth from residential development south of U.S. 30 as well as development along the proposed A Street extension. This signal will provide a much needed safe pedestrian crossing opportunity connecting the community south of the highway with the City Park in addition to its traffic operations benefit. This signal should provide protected left-turn phasing for highway traffic. Residential development will be the trigger for this improvement, and should be closely monitored to ensure that a signal is programmed when it becomes warranted. Currently this improvement is scheduled for the first decade.

7. Rockcrest Street Signal - Protected left-turn phasing for side-street traffic will be provided at this location in coordination with residential growth south of U.S. 30 which would be accessed via C Street (Washington Way)/Rockcrest Street, and with industrial and commercial development

in the northwest part of the city along Dike Road. This improvement is scheduled for the second decade.

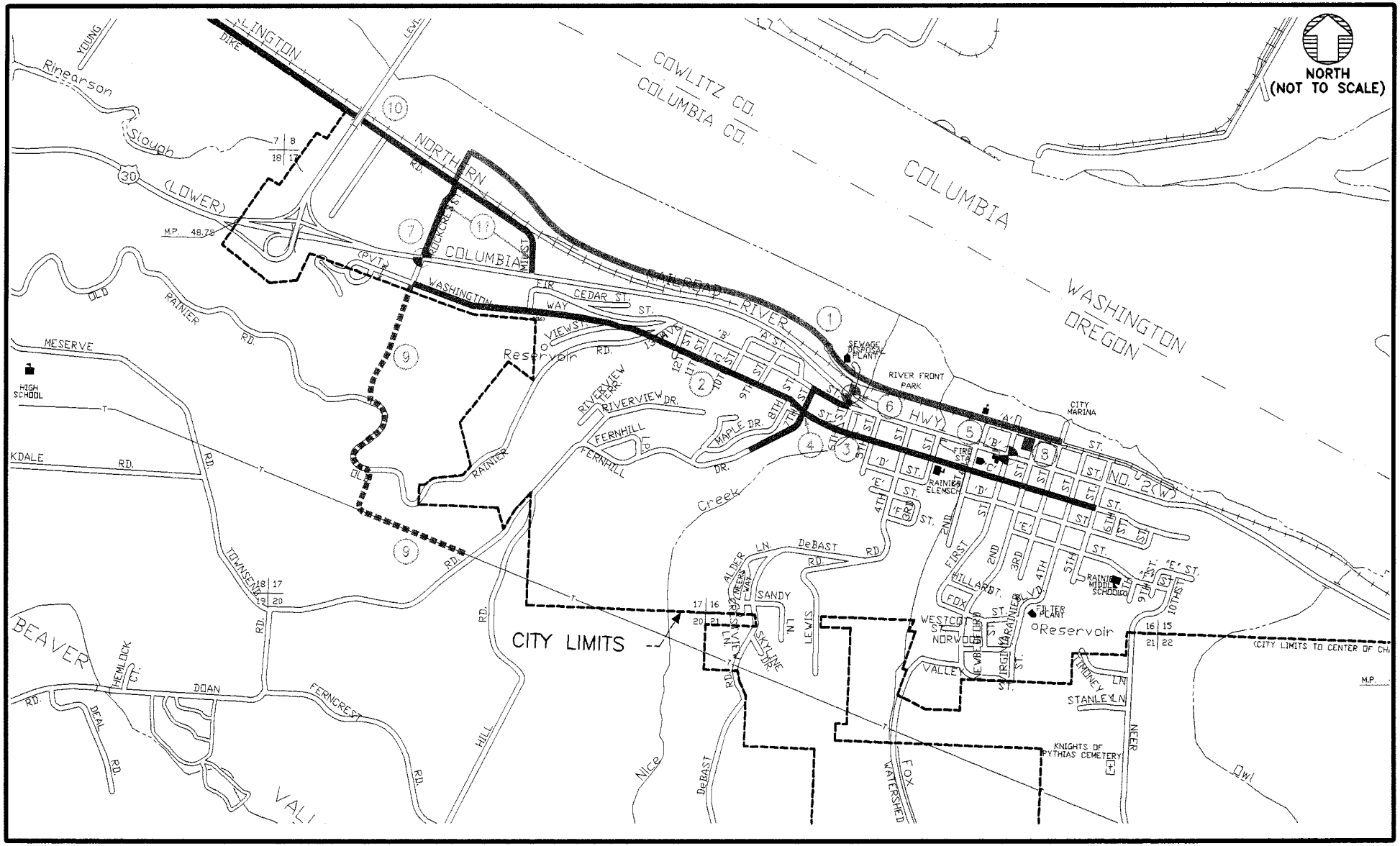
8. Parking lot provision - The City will acquire downtown property to provide additional parking to support downtown business and replace the potential loss of parking on B Street around the intersection of First Street. The likely location for this facility is the lot which lies in the southwest quadrant of the intersection of E. 2nd/A Street. Approximately thirty spaces will be provided. This improvement is scheduled for the first decade.

9. Powerline Road Alignment - The City will investigate a potential new route to link Fernhill Road to the south of the City Limits with Harbor Lane off Washington Way just east of Rockcrest Street. This possible alignment would allow traffic bound to and from the Longview Bridge to get to the Beaver Valley area without traveling through downtown Rainier. This is likely a long-term project, and would not happen before the second decade.

10. Dike Road Reconstruction - As part of the future development of the northwest riverfront area, Dike Road will be reconstructed to bring it up to Collector Street standards, with 12 foot lanes to allow safe and efficient truck traffic movements. This road will have bike lanes and sidewalks, and cost estimates for these are in the bicycle and pedestrian sections. This is a second decade project.

11. Rockcrest Street/Mill Street Reconstruction - These two short sections of road will be reconstructed to bring them up to Collector Street standards, with 12 foot lanes to allow safe and efficient truck traffic movements. Bike lanes and sidewalks will be provided, and cost estimates for these are in the bicycle and pedestrian sections. These are second decade projects.

Appendix E contains cost estimates and implementation schedule for the roadway improvement plan. Costs are included for new construction, roadway upgrading and reconstruction and for signal installation/upgrading. Total costs for roadway improvements are estimated at $8.31 million, with $4.94 million scheduled for the 1 to 10-year time frame and $3.37 million for the 11 to 20-year time frame.



LEGEND

- FIRST DECADE PROJECTS
- SECOND DECADE PROJECTS
- SIGNAL
- (X) PROJECT NUMBERS

STREET IMPROVEMENTS AND IMPLEMENTATION

TRANSPORTATION SYSTEM STUDY RAINIER, OREGON	FIGURE 14
SEPTEMBER 1997	

1795IMPR

PEDESTRIAN PLAN

Rainier has much to gain from promoting walking as an alternative means of transportation within the city. Noise and air pollution are reduced, the population benefits from a healthier lifestyle, parking demand is minimized and the community benefits from a more interactive lifestyle. With winter weather, steep grades and highway traffic as "opposition", the means to promote this mode lies in providing a safe and attractive environment for walkers, primarily through good sidewalks and pedestrian crossing locations.

Pedestrian plan elements are shown in Figure 15, and listed in Table 10. Broadly, the proposed network encompasses upgrading/infill of sidewalks to include continuous east-west sidewalks along existing and proposed sections of the following streets:

- A Street
- U.S. 30 / B Street
- C Street
- Dike Road
- E Street (part)
- A new greenway along the Columbia Riverfront will provide a combined bicycle/pedestrian path with a very attractive outlook, and good connections to the nearby downtown heart.

North/south connections will be improved on:

- Rockcrest Street
- Mill Street
- W 7th/Fernhill Drive
- W 4th/DeBast Road
- E Second Street
- E. Fifth Street.

A new signalized pedestrian crossing at W. Sixth Street will give access to the existing City Park location.

Pedestrian plan elements are shown in Table 10 with the implementation schedule which designates improvements as first decade or second decade priorities.

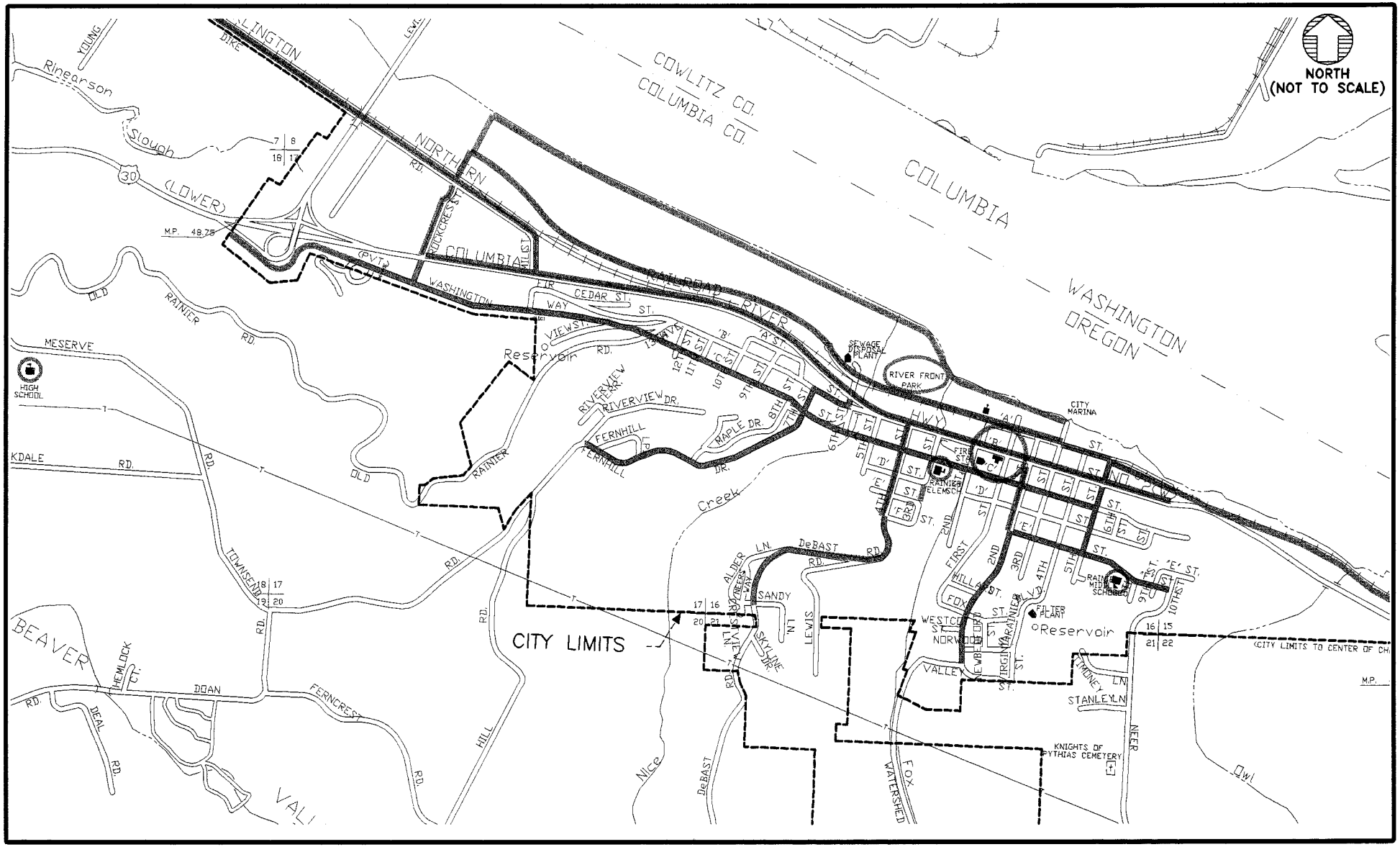
Table 10
Pedestrian Plan Elements

Street	From	To	(Note)	Implement. Decade
NEW SIDEWALKS				
U.S. 30 ("B" Street)	City Limit	City Limit		1
"A" Street	W. Second Street	Rockcrest Street		1
"E" Street	E. Second Street	Neer City Road	middle school	1
W. 7th/Fernhill	"B" Street	Riverview Drive		1
W. 4th/DeBast	"B" Street	Sandy Lane		1
E. Second Street	"A" Street	Watershed Rd.		1
Downtown Grid			infill of sidewalks	1
"C" Street	Rockcrest Street	E. Fifth Street	elementary school	2
Dike Road	UGB	Mill Street	one side only	2
Rockcrest Street	Dike Road	U.S. 30		2
Mill Street	Dike Road	U.S. 30		2
UPGRADE SIDEWALKS				
US 30	E. Seventh Street	W. Sixth Street	replacement	1
E. Fifth Street	"A" Street	"E" Street	middle school	1
Downtown grid			infill of sidewalks	1
TRAILS				
Riverfront Greenway	Rockcrest Street	Old City Marina	recreational	1
W. Third Street	"D" street	"E" Street	elementary school access	1
PEDESTRIAN CROSSING				
W. Sixth Street			City Park	1

Sidewalks should be provided with a minimum width of 5 feet (clear of obstacles) in accordance with A.D.A. regulations.

Pedestrian Plan Costs and Implementation

Appendix E contains the details of the costs and implementation for the Rainier Bicycle Plan element. Costs are included for new sidewalks, reconstruction of existing sidewalks and provision of new pedestrian (and multi-use) trails. Total project costs are $1.69 million, with $1.25 million scheduled for the first decade and $0.44 million for the second decade.



LEGEND

- COMBINED BICYCLE/PED TRAIL
- ARTERIAL/COLLECTOR SIDEWALK SYSTEM
- TRIP GENERATOR

PEDESTRIAN PLAN

TRANSPORTATION SYSTEM STUDY RAINIER, OREGON SEPTEMBER 1997	FIGURE 15

1795PED

BICYCLE PLAN

Bicycle plan elements are shown in Figure 16. Generally, it is advisable to provide bicycle facilities on all arterial and collector streets. Rainier is in a somewhat unique position in regard to the topography which, particularly in the north/south direction, does not lend itself to bicycle travel. On the other hand, the east-west routes which follow the Columbia River are fairly flat and lend themselves well to bicycle circulation. This has dictated the focus of the bicycle plan which includes facilities on U.S. 30/B Street as part of the Columbia River Highway bikeway. In addition, the new Columbia River greenway will provide a link along the river's edge between Rockcrest Street and First Street. Existing and proposed segments of "A" Street and Dike Road form the remainder of the bicycle system.

In addition, "C" Street between Fernhill Drive and E. Fifth Street should be signed as a bicycle route to provide a posted alternative route for children accessing the elementary and middle schools.

The Transportation Planning Rule requires that communities make accommodation for bicycles on virtually every roadway. The City and County roads leading from Rainier to the south are generally too narrow and windy to be considered safe bicycle routes, yet upgrading and widening to accommodate bicycles would be prohibitively expensive considering the number of cycle trips served, and the fact that the topography will probably prevent the demand for bicycle trips to grow very much in the future. However, a signing program should be considered on any routes that are identified as serving bicycle trips. This would be a low cost effort to increase safety for the few cyclists using these roads. As part of this plan, Old Rainier Road will be signed as a route as far as the high school and DeBast Road will be a signed bicycle route between "F" Street and Sandy Lane.

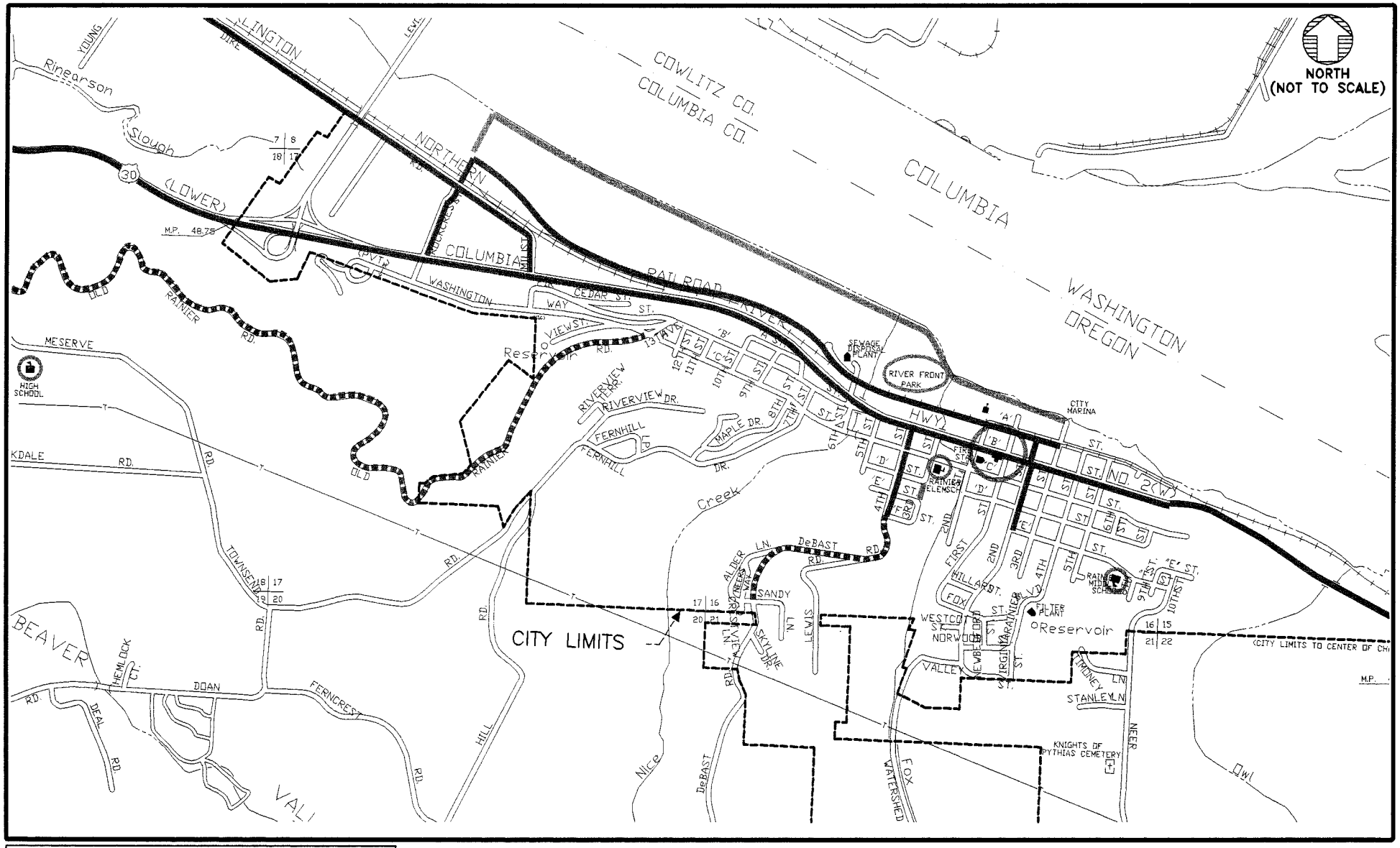
Bicycle plan elements are shown in Table 11 with the implementation schedule/prioritization.

Table 11
Bicycle Facilities

Street	From	To	Implementation
ON-STREET BIKE LANES			
U.S. 30/B Street	E. City Limit	W. City Limit	1
A Street	E. Fifth Street	Rockcrest Street	1
Dike Road	Mill Street	W. City Limit	2
Rockcrest Street	A Street	U.S. 30	2
Mill Street	Dike Road	U.S. 30	2
E. Second Street	A Street	E. Street	1
W. Fourth Street	A Street	F Street	1
SIGNED BIKE ROUTES			
W. 4th/ De Bast Road	F Street	Sandy Lane	1
Old Rainier Road	Washington Way	Highschool	1
BIKE TRAILS			
Riverfront Greenway	E. Third St.	Rockcrest Street	1

Bicycle Plan Costs and Implementation

The estimated total cost for the bicycle system elements is $0.81 million. This is divided into $0.17 million during the first decade and $0.64 million in the second. Cost estimates are detailed in Appendix E. Included are elements for on-street bike lanes, signed bike routes, bicycle trails and bicycle parking facilities.



LEGEND

- COMBINED BICYCLE/PED TRAIL
- BICYCLE LANE NETWORK
- SIGNED BIKE ROUTE
- TRIP GENERATOR

BICYCLE PLAN

TRANSPORTATION SYSTEM STUDY
RAINIER, OREGON
SEPTEMBER 1997

FIGURE 16

1795BIKE

TRANSIT PLAN

Communities the size of Rainier cannot typically support a fixed-route transit system - a population of 15,000 is typically considered marginal in this regard. However, para-transit can and does play an important and necessary part of the transportation system of smaller cities.

Columbia County Transit (COLCO) currently provides public transit service to all Rainier residents via a dial-a-ride program using 14-seat minibuses and regular minivans to provide door-to-door service for residents. Three vehicles are based in Rainier, each of which will be equipped with a wheelchair lift or ramp by the end of 1996. In June 1996, COLCO introduced service connecting Rainier to Tri-Met's route #17 (Sauvie Island), and thereby to downtown Portland. The City will work actively with COLCO to promote the use of this route, and make any possible improvements to service to benefit City residents.

During 1995, the COLCO paratransit service made approximately 20,000 trips serving residents of the City of Rainier. The comprehensive plan estimates a population growth of 132 percent over the twenty-year life of this plan. Extrapolating current service statistics indicates a transit demand rate of approximately 46,500 trips by year 2016. In reality, an aging population as well as a potential increase in the number of retired people moving to the area may increase the number of transit trips at a greater rate than the overall population growth. It is estimated that the current Rainier fleet of three vehicles will need to be increased by two to three vehicles over the next twenty years, not including vehicle replacement.

The City will support COLCO in coordinating with Cowlitz Transit Authority to provide a regularly scheduled connection between Rainier and Longview/Kelso, should the ridership warrant such service. A market assessment will be conducted to assess the viability of this route, and service will be connected with the existing COLCO para-transit service where possible. Inter-City transit stops should be focussed on U.S. 30 in the proximity of First Street with bus pull-outs to allow loading out of the traffic stream. Any transit stops developed as part of the transit plan - either for service to Portland or Longview - will be provided with secure bicycle parking racks as part of the transit plan element.

RAIL PLAN

A study of rail was commissioned by ODOT as part of its Lower Columbia River Corridor Study.

The scope of the study is as follows:

A field investigation will determine current track and structure conditions, analyze current operations and determine any clearance restrictions that would limit the type of future service.

An *issues and opportunities* analysis will explore future rail service demand and evaluate the existing options of abandonment and short line operation; identify supportive funding options; and prioritize recommendations for action by ODOT.

A Longview/Rainier Crossing Feasibility Study will analyzed the options for bridge or tunnel crossings of the Columbia in terms of design feasibility and economic impacts.

The conclusions of the study (December, 1996) and of additional research are as follows:

Current track and structural conditions are fair to good. The most serious traffic restriction is the tunnel at MP 54.5 which precludes the use of double stack containers west of this tunnel. Weight restrictions limit gross weight per car of 263,000 pounds and six-axles locomotives are not permitted. The weight restrictions result from limited bridge load capacities.
(The line has been acquired by the Pacific and Western Railroad, and abandonment is no longer an immediate concern.)

The Longview/Rainier crossing feasibility study concludes that a combined road/rail bridge between the two cities would be feasible if the bridge (or at least the rail bridge part) is a "lift span" design, that can be raised to allow passage of tall ships. (No decisions on the design of the bridge have been made.)

A bridge rail connection between Rainier and Longview could represent a tremendous opportunity for rail service, by providing an alternative route for traffic that now uses the Portland - Tacoma trackage shared by UP and BNSF. and by allowing direct service to the lower Columbia from the north bypassing Portland.

Additional opportunities would result from re-opening of the Wauna - Astoria segment, which would allow service to existing Astoria area industries (e.g. Willamette Industries) and to new industries that may locate in the Astoria area.

AIR TRAVEL

Existing facilities provide air service via Portland International Airport (50 miles), Astoria Airport (35 miles) and Kelso Airfield (15 miles.) Transit connections exist to the Portland International Airport via Columbia County Transit and Tri-Met although the routes and travel times are such that this mode will not likely ever be highly utilized.

The Rainier Transportation System Plan acknowledges the increasingly important role played by air transportation in the future and encourages the continued use and development of air transportation facilities available to Rainier residents and business people.

WATER TRANSPORTATION

The Rainier TSP supports the development of a marine terminal facility on the Columbia River at a location downstream of the Lewis and Clark Bridge. Development of this facility is expected to take place in combination with a major industrial developer at this site, and the Port of St. Helens has received regulatory approvals and funding commitments for the project.

The Interim Corridor Strategy study for the Lower Columbia River Highway supports the effort to dredge a deeper channel in the Columbia River between Astoria and Portland to allow for access by larger and deeper draft ships. In addition, the study supports the investigation of a ferry service between Astoria and Portland which would also serve Rainier. The Rainier TSP supports these recommendations as part of an effort to return the Columbia River to a transportation resource of greater importance. The potential for river transportation to reduce truck traffic on the Lower Columbia River Highway is seen as highly important in the future of the Lower Columbia River transportation corridor from the point of view of minimizing infrastructure costs and maintaining a small town lifestyle in the communities in the corridor.

PIPELINE PLAN

Current pipeline services include water, natural gas and sewer and transmission lines for electricity, cable television and telephone service. The Rainier TSP recognizes the importance of these services and encourages their continued use and improvement for movement of these commodities through the City. The plan is supportive of the provisions in the Oregon Transportation Plan which calls for the provision of a major natural gas pipeline between Portland and Astoria by the year 2012.

The Plan recognizes the increasing likelihood of telecommuting and other information superhighway technologies becoming viable alternatives to physical commuting; thus reducing and possibly even eliminating some automobile and transit trips during peak times. These commuting alternatives have the potential to reduce the need for expansion of the conventional transportation system infrastructure. As such, the use of telecommuting and other similar technologies should be encouraged through land use policy and plans.

ACCESS MANAGEMENT PLAN

The scope of this study did not include a detailed inventory of driveways and curb cuts on U.S. 30 through Rainier. As a result, the recommendations made under this section are of a policy rather than a specific nature. The Oregon Highway Plan (OHP) outlines spacing requirements for public roads, private driveways and traffic signals for six categories of state highways. According to the OHP, U.S. 30 is a highway of statewide importance. In the U.S. Highway 30 Interim Corridor Strategy Plan, the section of U.S. 30 through Rainier is a category three facility east of Nehalem Street and a category four facility to the west of Nehalem Street. Both these sections are urban. As a result, the highway is subject to the following access requirements:

Table 12
OHP Access Management Spacing Standards

Category	Urban/Rural	Public Road Spacing	Private Drive Spacing	Signal Spacing	Median Control
3	U	2,640' - 5,280'	800'	2,640 - 5,280'	Partial
4	U	1,320'	500'	2,640'	Partial/None (7)

(7) Use of physical median barrier can be interspersed with segments of continuous left-turn lane or, if demand is light, no median at all.

The spacing requirements outlined in Table 12 indicate that Rainier is currently in non-compliance with the OHP access spacing standards in both sections. The City blocks are spaced at 280 feet, with a public street on each side of a block. This indicates that current spacing of public streets does not meet even the requirements for public driveways for category 4 facilities. Implementation of the OHP would indicate that only every fourth city street should retain access to the highway in the category 4 section, with driveways spaced greater than a block-length apart (i.e. less than one driveway entrance per block face), and with driveways located opposite each other on each side of the highway. In category 3 sections, even fewer public roadways would retain access.

Site reconnaissance indicated that there are numerous instances within the city where there exist wide curb cuts which allow off-street head-in parking, and areas where the highway leads directly into a parking lot without defined curb cuts. Land uses for which these conditions exist include grocery stores and gas stations amongst others.

The local ODOT district office is enforcing the current access management policy to the extent possible when one of the following conditions apply:

- redevelopment of properties on the highway frontage takes place,
- a major transportation improvement is implemented on U.S. 30, or
- a safety problem associated with private access to the highway is identified at a specific location.

Wherever possible, the District is closing non-permitted driveways and reducing the number of driveway accesses to one per block face at maximum. In all cases, ODOT will ensure that each

property has access to a public roadway. The Rainier TSP supports these efforts to keep U.S. 30 a safe and efficient transportation facility.

The Rainier TSP does not support strict implementation of the OHP access spacing standards. Closing public streets would create the need for more traffic signals by concentrating traffic at a few locations, and would create a potentially dangerous situation for accessibility by emergency vehicles including fire trucks.

Access Management Implementation

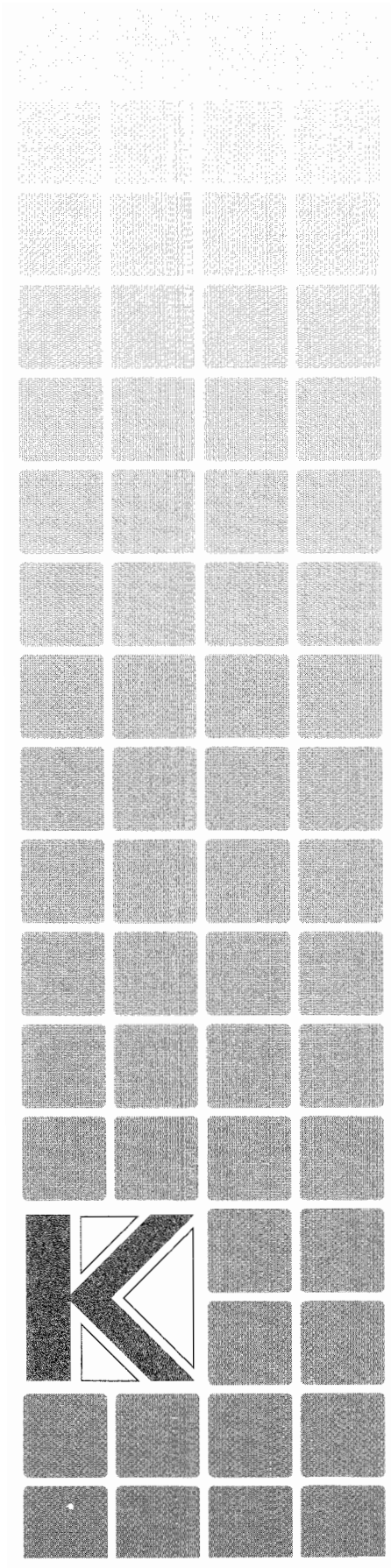
The Rainier TSP supports the ODOT District office work to reduce the number of non-essential private driveways gaining access directly to the highway. The number of drives should be reduced, where possible, to one per block face with driveways on either side of the highway located opposite each other.

Where possible, access to blocks adjacent to the highway will be restricted to driveways on a side street. To this end, the City of Rainier will implement a process for working towards providing primary access via City streets for properties located on U.S. 30. Driveway connections between adjacent lots (cross-over easements) should be used where possible to reduce the number of driveways.

Those instances indicated where head-in parking is allowed directly off the highway, and where lots have wide ill-defined access drives rather than defined curb cuts will be eliminated when possible. These examples both present safety hazards due to following drivers being unable to anticipate when a vehicle ahead of them will turn off the highway to access the adjacent land use.

Summary

Implementation of access management strategies within the City of Rainier will be pursued as a highly important means of optimizing traffic capacity and safety on U.S. 30 within the Rainier urban area. Effective access management could mean the difference between the need to widen U.S. 30 to four lanes over the twenty-year planning period, or leave it in its current configuration. The historical nature of the City layout with small blocks and closely spaced City streets indicates that it is unlikely that the City will meet the requirements of the OHP access spacing requirements; however, some degree of improvement can be achieved, and the City will strive to support ODOT's access policies for U.S. 30 by coordinating its planning efforts with ODOT and continuing to communicate information on adjacent land use activities to ODOT.



Section 5

Finance Plan

Transportation Finance Plan

This section of the TSP discusses the estimated costs and planned revenue sources for the transportation system improvements called for in the plan.

ESTIMATED COSTS

The estimated cost of the projects in 1996 dollars is presented in Table 13. The plans to undertake a given project in the first or second decade are discussed in the previous section. These costs are construction costs only and do not include land acquisition, design or administration. The costs do include contingencies. Details of the cost estimates are provided in Exhibit E. The grand total of the cost of all improvements $4,441,493 in the first decade and $4,454,240 in the second decade.

POTENTIAL REVENUE SOURCES

Revenues for the above improvements can come from a variety of sources, some of which are local (i.e., from the City of Rainier) and some of which come from other sources, including Columbia County and the State of Oregon.

Local Revenue Sources

Potential local sources of revenue include the proceeds from transportation systems development charges, which are to be spent for facilities that serve growth within the UGB, the proceeds of general obligation bonds supported by property taxes, the proceeds of Bancroft Bonds for Local Improvement Districts and transportation improvement requirements placed on applicants for land use and building permit approvals.

Systems Development Charges (SDC's)

Systems development charges are fees that are imposed on the applicant for a building permit (or in some cases, a subdivision or partition approval) that are limited to use for development or reimbursement for previous development of transportation facilities designed to serve the increase in demand on the transportation system. The City of Rainier has adopted an ordinance that authorizes the imposition of SDC's for water, sewer, parks and transportation. To date, the City has only actually imposed an SDC for water service. In order to impose a transportation SDC, the City would have to complete additional studies that specific the improvements required by growth and their costs. This TSP provides a solid basis for such studies.

SDC's are perceived as fair because they require development "to pay its own way." However, if SDC's are higher than in surrounding jurisdictions, they may cause development to bypass the locality in favor of less expensive alternative locations. Most of the cities in the Portland metro area have transportation SDC's and the City of Portland itself is in the process of adopting one.

Table 13
Costs of Planned Transportation Improvements
(1996 Dollars)

	COSTS 1997-2006	COSTS 2007-2016
Street Improvements		
ROAD CONSTRUCTION		
A St.: W. Second to Rockcrest	2,782,080	
C St.: E. 5 to Rockcrest		387,200
C St.: Bridge		1,700,000
C St./Fernhill Intersection		249,600
Dike Rd.: UGB/Mill	to come	
Rockcrest: Dike Rd. to Hwy 30	to come	
Mill St.: Dike Rd. to Hwy 30	to come	
Parking Lot: A St. to Second	88,000	
Powerline Rd.: Alignment		972,400
SIGNALS		
First and B St.		30,000
Rockcrest and Hwy 30		30,000
W. Sixth and Hwy 30	150,000	
Total	3,020,080	3,369,200
Sidewalks		
NEW SIDEWALKS		
Hwy 30: E. Seventh to W. Sixth	101,200	
A St.: W. Second to Rockcrest	308,000	
E. St.: E. Second to E. 10th	88,000	
Downtown Grid Infill	176,000	
Debast: E. St. to Sandy Ln.	55,000	
E2nd: E. St. to Watershed	74,800	
Fernhill: C St. to Riverview	63,800	
C St.: W. Fifth to Rockcrest		220,000
Dike Rd.: UGB to Mill		176,000

Rockcrest: Dike Rd. to Hwy 30		35,200
Mill St.: Dike Rd. to Hwy 30		13,200
UPGRADE/REPLACE		
Hwy 30: E. Seventh to W. Sixth	66,000	
Downtown Grid	66,000	
E. Fifth: A St. to E St.	39,600	
TRAILS		
Riverfront: E. Third to Rockcrest	198,000	
W. Third: D St. to E St.	11,000	
Total	1,247,400	444,400
Bicycle Plan Improvements		
ON STREET BIKE LANES		
Dike Rd.: Mill St. to UGB		563,200
Rockcrest: A St. to Hwy30		56,320
Mill St.: Dike Rd. to Hwy30		21,120
E. Second: A St. to E St.	84,480	
W. Fourth: A St. to F St.	84,480	
SIGNED BIKE ROUTES		
Debast Rd: F St. to Sandy Ln.	1,371	
Old Rainier Rd.: Meserve to C St.	1,371	
BICYCLE PARKING		
Library/City Hall	193	
Middle School	385	
Elementary School	385	
High School	770	
Riverfront park	578	
Total	174,013	640,640

General Obligation Bonds

General Obligation (GO) Bonds are bonds (long term debt) that require voter approval and that are supported by a levy of property taxes. Taxes for GO Bonds are exempt from the Ballot Measure 5 limits, and, if approved properly, are exempt from the "cut and cap" impacts of Ballot Measure 47.

The proceeds of GO Bonds can be used for capital improvements for both existing residents and future growth. The rationale for use of GO Bonds is that they are a way of financing improvements that are of benefit to the entire city. There is a limit to the amount of GO bonds that can be issued by a municipality, but Rainier is not close to that limit.

Bancroft Bonds/Local Improvement Districts

Bancroft Bonds are used to finance the cost of public improvements that specifically benefit a defined set of properties that then comprise a Local Improvement District (LID). Property owners may petition the City to establish an LID and to issue tax exempt bonds to pay for the improvements. The property owners are then assessed for the payment of the bonds. Payments for LID assessments are not subject to the Measure 5 property tax limits and would be unaffected by Measure 47 unless there was a default on the bond. Defaults are uncommon because the property itself is pledged as security for the assessments and can be foreclosed upon and sold if the property owner becomes delinquent in his or her payments.

The rationale for Bancroft Bonds and LID's is that the costs of transportation improvements that provide benefits for specific properties are normally paid by those properties.

Transportation Improvements as Conditions of Permit Approvals

It is common for a City to impose transportation improvements as a condition of approving a subdivision or building permit. For instance, a subdivision applicant is required to build and dedicate to the city the local streets and utility easements that serve the subdivision. If the City has a transportation SDC, the requirements for improvements as conditions of permit approval must be coordinated with the SDC so that a developer does not pay twice for the same improvements. Commonly, a developer will be required to construct the equivalent of half a local street along the frontage of the parcel. If the street is a collector or arterial, the developer is commonly entitled to a refund for the costs of the project that exceed the local half-street improvement.

Other Local Sources

The City could use any other revenue available to it for transportation improvements, unless the use of such funds are otherwise restricted.

Non-Local Revenue Sources

Columbia County Road Fund

Columbia County maintains a road fund to construct, repair and maintain roads within its jurisdiction. Funding is commonly difficult to obtain as needs for improvements vastly exceed the funds available. In addition, the County has been seeking to transfer jurisdiction of County roads in Rainier to the City.

State Transportation Improvement Program

The State Transportation Improvement Program (STIP) is administered by ODOT and finances transportation improvements statewide. The program is funded with a variety of Federal and state revenue sources. Projects funded through the STIP are selected and prioritized according to well established criteria and those that are selected are placed in two-year plans. The current STIP covers the period from 1996-98. Projects funded in the STIP are those that are judged to have significance for the ODOT Region.

Special Public Works Fund and Other Economic Development Funds

The Special Public Works Fund and other economic development funds are administered by the Oregon Department of Economic Development (OEDD). OEDD makes such funds available on a grant or loan basis for projects that specifically serve development projects that generate jobs or other tangible economic benefits.

FINANCE PLAN

Improvements that are required to mitigate the impact of a specific new development or redevelopment project may be funded by the developer as a condition of development approval.

1. Improvements that are required to mitigate the impact of a specific new development or redevelopment project may be funded by the developer as a condition of development approval.
2. Improvements that are required to mitigate the impacts of growth over and above those resulting from a specific new development or redevelopment project may be funded by a City road fund which receives money from payment of road system development charges (SDC's) and other revenue sources.
3. Improvements that benefit the City as a whole may be funded through general obligation bonds.
4. Improvements that result in reductions to or smaller increases in local traffic volume on Highway 30 or that implement other strategies of the Highway 30 Corridor Plan may be funded through the State Transportation Improvement Program (STIP). These strategies include (a) achieving a transportation balance, (b) improving regional connectivity, © reducing highway congestion, (d) improving roadway conditions, (e) improving safety, (f) reducing environmental impacts and energy consumption, (g) reducing negative impacts on land use and livability, and (h) creating positive economic impacts.

5. Improvements that meet specific objectives of the Rainier Waterfront Urban Renewal Plan may be funded by the urban renewal agency (REDCO).
6. Improvements that are critical to development projects that meet Oregon's economic development objectives may be funded by the Oregon Economic Development Department.
7. Improvements that benefit a local improvement district may be funded by Bancroft Bonds.
8. Improvements to roads under Columbia County jurisdiction may be funded by the County.

Table 14 below shows the allocation of the costs of transportation improvements to the different revenue sources. The allocation was based on several guidelines:

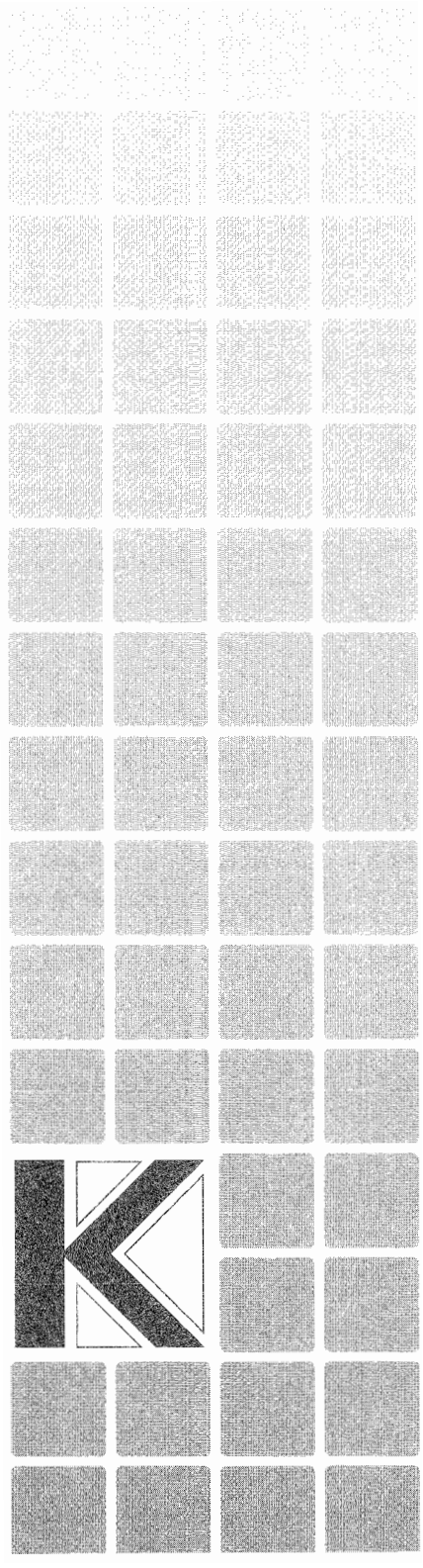
TABLE 14

RAINIER TRANSPORTATION IMPROVEMENT PROJECTS: FINANCE PLAN

	COSTS		REVENUES																										
Street Improvements	Phase I: '97-06	Phase II '07-16	Site Development Requirements	Phase I		SDC's	Phase I	Phase II	GO Bonds	Phase I	Phase II	STIP	Phase I	Phase II	Urban Renewal	Phase I	Phase II	Economic Development	Phase I	Phase II	Bancroft Bonds	Phase I	Phase II	County Road Fund	Phase I	Phase II	Total
ROAD CONSTRUCTION																													
A ST. W2nd/Rockcrest**	2,782,080		25%	695,520	0	10%	278,208	0		0	0	30%	834,624	0	10%	278,208	0	25%	695,520	0		0	0		0	0	1.00
C ST. E5/Rockcrest*		387,200	10%	0	38,720	10%	0	38,720	15%	0	58,080	65%	0	251,680		0	0		0	0		0	0		0	0	1.00
C ST Bridge*		1,700,000		0	0		0	0	15%	0	255,000	85%	0	1,445,000		0	0		0	0		0	0		0	0	1.00
C ST/Fernhill*		249,600		0	0		0	0	15%	0	37,440	85%	0	212,160		0	0		0	0		0	0		0	0	1.00
Rockcrest Dike Rd./Hwy 30	169,000			0	0		0	0		0	0		0	0		0	0	75%	126,750	0		0	0	25%	42,250	0	1.00
Mill Dike Rd./Hwy 30		63,000		0	0		0	0		0	0		0	0		0	0	50%	0	31,500		0	0	50%	0	31,500	1.00
Dike Rd. Mill/UGB	1,690,000			0	0		0	0		0	0		0	0		0	0	75%	1,267,500	0		0	0	25%	422,500	0	1.00
Parking Lot A ST/2nd	88,000			0	0		0	0		0	0		0	0		0	0	100%	88,000	0		0	0		0	0	1.00
Powerline RD. Alignment		972,400		0	0	50%	0	486,200	50%	0	486,200		0	0		0	0		0	0		0	0		0	0	1.00
SIGNALS																											
1ST/B*		30,000		0	0		0	0		0	0	100%	0	30,000		0	0		0	0		0	0		0	0	1.00
Rockcrest/Hwy 30*		30,000		0	0		0	0		0	0	100%	0	30,000		0	0		0	0		0	0		0	0	1.00
W 6th/Hwy 30*	150,000			0	0		0	0		0	0	100%	150,000	0		0	0		0	0		0	0		0	0	1.00
Total	4,879,080	3,432,200		695,520	38,720		278,208	524,920		0	836,720		984,624	1,968,840		278,208	0		2,177,770	31,500		0	0		464,750	31,500	
Sidewalks																											
NEW SIDEWALKS																											
Hwy 30 E7th/W6th*	101,200			0	0		0	0		0	0	100%	101,200	0		0	0		0	0		0	0		0	0	1
A ST. W2nd/Rockcrest*	308,000			0	0		0	0		0	0	100%	308,000	0		0	0		0	0		0	0		0	0	1
E ST E2nd/E10th	88,000			0	0		0	0		0	0		0	0		0	0		0	0	100%	88,000	0		0	0	1
Downtown Grid Infill	176,000			0	0		0	0	25%	44,000	0		0	0	50%	88,000	0		0	0	25%	44,000	0		0	0	1
Debast E ST/Sandy Ln.	55,000		25%	13,750	0	25%	13,750	0	50%	27,500	0		0	0		0	0		0	0		0	0		0	0	1
E2nd E St/Watershed	74,800			0	0		0	0		0	0		0	0		0	0		0	0	100%	74,800	0		0	0	1
Fernhill C ST/Riverview	63,800		25%	15,950	0	25%	15,950	0	50%	31,900	0		0	0		0	0		0	0		0	0		0	0	1
C St. W5th/Rockcrest		220,000		0	0		0	0		0	0		0	0	100%	0	220,000		0	0		0	0		0	0	1
Dike Road UGB/Mill		176,000		0	0		0	0		0	0		0	0	100%	0	176,000		0	0		0	0		0	0	1
Rockcrest Dike Rd/Hwy 30		35,200		0	0		0	0		0	0		0	0	100%	0	35,200		0	0		0	0		0	0	1
Mill St Dike Rd/Hwy 30		13,200		0	0		0	0		0	0		0	0	100%	0	13,200		0	0		0	0		0	0	1
UPGRADE/REPLACE																											
Hwy 30 Eth/W6th*	66,000			0	0		0	0		0	0	100%	66,000	0		0	0		0	0		0	0		0	0	1
Downtown Grid	66,000			0	0		0	0		0	0		0	0	50%	33,000	0		0	0	50%	33,000	0		0	0	1
E 5th A ST/E ST	39,600			0	0		0	0	100%	39,600	0		0	0		0	0		0	0		0	0		0	0	1
TRAILS																											
Riverfront E 3rd/Rockcrest	198,000		25%	49,500	0		0	0		0	0		0	0	75%	148,500	0		0	0		0	0		0	0	1
W 3rd D St/E St	11,000			0	0		0	0	100%	11,000	0		0	0		0	0		0	0		0	0		0	0	1
	1,247,400	444,400		79,200	0		29,700	0		154,000	0		475,200	0		269,500	444,400		0	0		239,800	0		0	0	
Bicycle Plan Improvements																											
ON STREET BIKE LANES																											
Dike Road Mill St/UGB		563,200		0	0		0	0		0	0		0	0	100%	0	563,200		0	0		0	0		0	0	1
Rockcrest A St/Hwy30		56,320		0	0		0	0		0	0		0	0	100%	0	56,320		0	0		0	0		0	0	1
Mill St Dike Rd/Hwy30		21,120		0	0		0	0		0	0		0	0	100%	0	21,120		0	0		0	0		0	0	1
E 2nd A St/E St	84,480			0	0		0	0	100%	84,480	0		0	0		0	0		0	0		0	0		0	0	1
W 4th A St/F St	84,480			0	0		0	0	100%	84,480	0		0	0		0	0		0	0		0	0		0	0	1
SIGNED BIKE ROUTES																											
Debast Rd F St/Sandy Ln	1,371			0	0		0	0	100%	1,371	0		0	0		0	0		0	0		0	0		0	0	1
Old Rainier Rd Meserve/C St	1,371			0	0		0	0	100%	1,371	0		0	0		0	0		0	0		0	0		0	0	1
BICYCLE PARKING																											
Library/City Hall	193			0	0		0	0	100%	193	0		0	0		0	0		0	0		0	0		0	0	1
Middle School	385			0	0		0	0	100%	385	0		0	0		0	0		0	0		0	0		0	0	1
Elementary School	385			0	0		0	0	100%	385	0		0	0		0	0		0	0		0	0		0	0	1
High School	770			0	0		0	0	100%	770	0		0	0		0	0		0	0		0	0		0	0	1
Riverfront park	578			0	0		0	0	100%	578	0		0	0		0	0		0	0		0	0		0	0	1
Total	174,013	640,640		0	0		0	0		174,013	0		0	0		0	640,640		0	0		0	0		0	0	
Grand Total	6,300,493	4,517,240		774,720	38,720		307,908	524,920		328,013	836,720		1,459,824	1,968,840		547,708	1,085,040		2,177,770	31,500		239,800	0		464,750	31,500	

* Projects that have greatest need for STIP Funding

** Projects with some need for STIP funding



Section 6

Comprehensive Plan and Implementing Ordinance Amendments

Comprehensive Plan and Implementing Ordinance Amendments

The ~~final adopted~~ TSP ~~will become~~ is an element of the Rainier Comprehensive Plan. Implementing the TSP will require amendments to the Comprehensive Plan policies and to the implementing ordinances of the Comprehensive Plan. These currently consist of the Zoning Ordinance and the Land Division Ordinance.

The TSP contains recommendations for amendments to the Comprehensive Plan and implementing ordinances. These recommendations will be presented for review and adoption following the adoption of the TSP.

This section contains the recommended amendments. ~~It contains the~~, including ~~recommended language for~~ amendments to ~~the~~ Goal 12 - Transportation policies of the Comprehensive Plan and ~~the recommended language for~~ several sections of the Zoning Ordinance. No amendments were determined to be necessary to the Land Division Ordinance. New language is underlined; deleted language is ~~crossed out.~~

Goal 12 - Transportation Amendments

GOAL 12: TRANSPORTATION

To provide and encourage a safe, convenient and economic transportation system.

FINDINGS:

1. The City is currently participating with the Oregon Department of Transportation's Highway 30 Corridor Study, which is addressing the needs for multi-modal access throughout the Corridor, which stretches from Portland to Astoria.

2. The City ~~intends to undertake~~ has completed a Transportation System Plan (TSP) to address multimodal transportation needs within the City. Policies related to the TSP are stated in this section of the Comprehensive Plan and in the TSP.

3. Rainier has very strong transportation facilities, including highway, river-borne and rail. Conflicts between through movements on both highway and rail and local use of these facilities and adjacent rights of way continues to be a major challenge for Rainier.

POLICIES:

1. The City will coordinate with the Oregon Department of Transportation (ODOT) on the Highway 30 Corridor Study. In particular, the City will advocate consideration of the following local issues as part of the larger corridor study:

a. Need for improved pedestrian access along and across U.S. 30 in Rainier
b. Improved local traffic flow between the residential and commercial areas of Rainier
c. Congestion and safety problems near the south end of the Longview Bridge

2. The City will take the following actions to enhance connectivity with the I-5 Corridor:

Work with Columbia County, ODOT, the Longview-Kelso-Rainier Metropolitan Planning Organization (MPO) and other appropriate Washington local governments and agencies to plan for greater connectivity, including evaluating alternatives for repair or replacement of the Lewis and Clark Bridge.

Participate in implementing network improvement plans, including bridge, road and street improvements and signage.

~~2~~3. The City will seek to have adequate pedestrian and/or bicycle paths included in the design of any major improvement to U.S. 30 through Rainier.

~~3~~4. The City shall require ~~consideration of the function, capacity and level of service of U.S. 30~~ compliance with the Transportation System Plan as a criteria for approval of development and plan amendment proposals.

~~4~~5. The City will ~~adopt~~ use adopted road standards to govern the improvement of public and private streets.

~~5~~6. The road standards will include provisions for reduced road widths in areas of steep slope to minimize cutting, filling and erosion.

~~6~~7. The City may require that any ~~All~~ subdivisions, planned developments and developments allowed as a conditional uses ~~shall~~ be accompanied by a traffic impact statement describing the potential on-site and off-site impacts of the proposed development, including the need for off-site road improvement and signals.

~~7~~8. The City will review and recommend any needed changes in the on-street parking or traffic patterns of the existing commercial core.

~~8~~9. The City will support the efforts of Columbia County to meet the needs of the transportation disadvantaged of Rainier.

~~98~~10. The City will support efforts to increase the availability of public transit to the residents of Rainier. This may include the extension of bus service to Rainier from Longview.

~~109.~~11 The City will ~~encourage the improvement and use~~ implement the TSP to achieve ~~of~~ a multi-modal transportation system including highway, rail, water, public transportation, and pedestrian and bicycle facilities. Rainier's varied transportation facilities can be leveraged to attract new development to the community.

~~11. The City will revise the Zoning and land Division Ordinance to address the Transportation Planning Rule, with specific emphasis on improved street connectivity and pedestrian oriented development.~~

12. In locations that conform to the Comprehensive Plan and Zoning Ordinance, the City will support the provision of docks, marine terminals, wharves and dolphins to accommodate deep draft and shallow draft cargo movement and the development of intermodal connections between marine facilities, rail and highways to facilitate and improve freight movement.

13. Within the context of other applicable goals, the City will encourage roadway improvements along Highway 30 and between Rainier and Interstate 5. The City will support efforts to improve the bridge connection between Rainier and Longview.

~~10~~3. Transportation System Plan Policies

Approval Processes for Transportation Improvements

The Transportation System Plan (the "Plan") is an element of the City of Rainier Comprehensive Plan. It identifies the general location of transportation improvements. Changes in the specific alignment of proposed transportation projects shall be permitted without amendment of the Plan if the new alignment falls within a transportation corridor identified in Plan.

The following actions, when taken in accordance with the Plan, shall be permitted without the need for approval by the Planning Commission or City Council and are not subject to land use regulations unless otherwise noted:

Operation, maintenance, repair, and preservation of existing transportation facilities including road, bicycle, pedestrian, bridge, dock port, airport, rail facilities and major regional pipelines and terminals (except where specifically regulated).

Dedication of right-of-way, authorization of construction and the construction of facilities and improvements in accordance with the roadway standards stated in the Plan.

Changes in the frequency of transit, rail and airport services.

Construction of climbing and passing lanes within the right of way existing as of July 1, 1987.

Reconstruction or modification of public roads and highways, including the placement of utility facilities overhead and in the subsurface of public roads and highways along the public right of way, but not including the addition of travel lanes, where no removal or displacement of buildings would occur, or no new land parcels result.

Temporary public road and highway detours that will be abandoned and restored to original condition or use at such time as no longer needed.

Minor betterment of existing public road and highway related facilities, such as maintenance yards, weigh stations and rest areas, within right of way existing as of July 1, 1987, and contiguous public-owned property utilized to support the operation and maintenance of public roads and highways.

Policies for Protection of Transportation Facilities

The City of Rainier wishes to protect future operation of the Highway 30 corridor, including the highway, pedestrian and bikeways and the rail line. The City also seeks to protect existing and planned transportation systems by continuing coordination with other relevant agencies, adhering to the road standards and following the access management policies and other measures contained in the Plan.

The policies of the City of Rainier related to protection of transportation facilities are:

To protect the function of existing and planned roadways as identified in the Transportation System Plan.

In particular, the City will seek to reduce the number of direct access points to Highway 30. The number of driveways with direct access to Highway 30 shall be reduced, where possible, to one per block face, with driveways located opposite each other on either side of the highway.

~~Where possible~~ **Except where impracticable**, access to blocks adjacent to the highway should be restricted to a driveway on a side street. Driveway connections between adjacent lots (cross easements) should be used where possible to reduce the number of driveways. The City shall develop more specific access management plans that provide for continuous access systems between properties on blocks adjacent to Highway 30.

To consider of the impact on existing or planned transportation facilities in all land use decisions.

To protect the function of existing or planned roadways or roadway corridors through the application of appropriate land use regulations.

To consider the potential to establish or maintain accessways, paths, or trails prior to the vacation of any public easement or right-of-way.

To preserve right-of-way for planned transportation facilities through exactions, voluntary dedication, or setbacks.

Recommended Amendments to Zoning Ordinance

The table below lists the incorporation of various standards and recommendations for implementation of the TSP into the Rainier Zoning Ordinance.

TSP Implementation Measure	**City of Rainier Ordinance Amendments**
Standards for Transportation Improvements	Zoning Ordinance, new section 5.16, Transportation Improvements
Transportation Improvements as Conditional Uses	Zoning Ordinance, new section 5.16, Transportation Improvements
Access Management:	
Corner Clearance	Zoning Ordinance, Section 5.12, Off street parking and loading.
Joint and Cross Access	Zoning Ordinance, Section 5.5 Access
Reduced Requirements for Shared Parking	Zoning Ordinance, Section 5.12, Off street parking and loading
Driveway Design	Zoning Ordinance, Section 5.12, Off street parking and loading
Shared access	Zoning Ordinance, Section 5.5, Access
Connectivity	Exists in Land Division Ordinance, section 640
Notice on Land Use decisions	Zoning Ordinance, Section 6.7, Design Review
Coordinated Review	Zoning Ordinance, Section 6.7, Design Review
Traffic Impact analysis	Zoning Ordinance, Section 6.7, Design Review
Bicycle Parking	Zoning Ordinance, Section 5.12 Parking
Bike and Pedestrian Circulation	Zoning Ordinance, Section 5.5, Access

The recommended amendments are as follows:

SECTION 5.5 ACCESS

[Existing text is codified as section 5.5 A.]

A. Every lot shall abut a street other than an alley for at least 20 feet.

B. Direct access from a lot to a roadway classified as an arterial or collector in the Transportation System Plan shall be subject to approval by the Public Works Director.

Direct access to Highway 30 shall be approved only after consultation with ODOT. The number and location of access points shall be governed by the need to provide reasonable access to the lot while minimizing the number of individual access points. Where a lot may take access from either of two different streets, access to the lot shall be from the street with the lower functional classification, unless access from such street precludes reasonable development of the lot according to the development standards of the applicable zone.

C Adjacent commercial or office uses containing over 10,000 square feet in floor area located on Highway 30 shall provide a cross access drive and pedestrian access to allow circulation between the sites.

D. Internal pedestrian circulation shall be provided in new commercial, office, and multi-family residential developments through the clustering of buildings, construction of hard surface walkways, landscaping, accessways, or similar techniques.

E. On-site facilities shall be provided that accommodate safe and convenient pedestrian and bicycle access within new subdivisions, multi-family developments, planned development, shopping centers, and commercial districts, and connecting to adjacent residential areas and neighborhood activity centers within one-half mile of the development. Residential developments shall include streets with sidewalks and accessways. Pedestrian circulation through parking lots shall be provided in the form of accessways.

SECTION 5.12 OFF-STREET PARKING AND LOADING.

General Provisions. This section contains parking standards which are applicable to uses in all zones. At the time of construction of a new building, or an addition to an existing building or land which results in intensified use by customers, occupants, employees or other persons, off-street parking and loading shall be provided according to the requirements of this section.

Continuing Obligation. The provision for and maintenance of off-street parking and loading facilities shall be a continuing obligation of the property owner.

Use of Space.

A. Required parking spaces shall be available for the parking of vehicles of customers, occupants and employees.

B. Required loading spaces shall be available for the loading and unloading of vehicles associated with the transportation of goods or service.

Joint Use of Facilities. The minimum parking requirements for ~~Owners of~~ two or more adjacent uses ; structures or parcels of land that share access may be reduced by the Planning Commission from those stated in this section, where the peak parking demands do not occur at the same time periods. ~~agree to jointly utilize the same parking and loading spaces when hours of operation do not~~

~~overlap.~~ Satisfactory legal evidence must be presented to the Planning Commission in the form of deeds, leases, or contracts to document shared use and full access to such parking and loading areas.

Location. Spaces required by this Section shall be provided on the site of the primary use. However, the Planning Commission may permit parking to be located within three hundred (300) feet from site or may permit the use of on street parking to meet a portion of the parking needs when a hardship can be shown.

Change of Use. In case of enlargement or change of use, the number of parking or loading spaces required shall be based on the total area involved in the enlargement or change in use.

Design Standards. The design standards shall apply to all parking, loading and maneuvering areas, except those for single and two-family residential dwellings on individual lots.

Loading Spaces.

A. Commercial: each required space shall be at least twelve (12) feet in width and thirty-five (35) feet in length.

B. Industrial: each required space shall be at least twelve (12) feet in width and sixth (60) feet in length.

C. Clearance: the height of each required loading space shall provided a minimum vertical clearance of thirteen (13) feet.

Parking Space Dimensions.

A. The standard size of a parking space shall be nine (9) feet in width by eighteen (18) feet in length.

B. Up to 20% of required parking spaces may be designed for compact car dimensions of seven and one-half (7.5) feet in width by fifteen (15) feet in length.

C. Handicapped parking spaces shall be twelve (12) feet in width by eighteen (18) feet in length.

D. For parallel parking the length of the parking space shall be increased to twenty-two (22) feet.

Aisles. Aisles shall not be less than:

A. 25 feet in width for 90 degree parking

B. 20 feet in width for 60 degree parking

C. 20 feet in width for 45 degree parking

D. 12 feet in width for parallel parking

Access. There shall be no more than one (1) forty-five (45) foot wide curb cut driveway per one hundred and fifty (150) feet of frontage, or fraction thereof, permitted per site. However, where the property abuts an arterial or collector street, the number of access points permitted shall be the minimum number necessary to provide reasonable access to these properties, not the maximum available for that frontage.

If the driveway is a one way in or one way out drive, then the driveway shall be a minimum width of 10 feet and shall have appropriate signage designating the driveway as a one way connection.
For two-way access, each lane shall have a minimum width of 10 feet.

Driveway approaches must be designed and located to provide an exiting vehicle with an unobstructed view. Construction of driveways along acceleration or deceleration lanes and tapers shall be avoided due to the potential for vehicular weaving conflicts.

The length of driveways shall be designed in accordance with the anticipated storage length for entering and exiting vehicles to prevent vehicles from backing into the flow of traffic on the public street or causing unsafe conflicts with on-site circulation.

Surfacing and Marking. The surface of each parking area shall be concrete or asphalt and meet minimum City standards to handle the weight of the vehicles which will use the parking areas. All areas used for parking shall be marked and continuously maintained. Handicapped parking spaces shall be marked with a wheelchair symbol.

Drainage and Lighting. Adequate drainage shall be provided to dispose of the runoff generated by the impervious surface areas of the parking lot. The drainage system shall function so it will not adversely affect adjoining property. lighting shall be provided in such as manner as to insure the safety of the parking area without interfering with adjoining properties or creating traffic hazards on adjoining streets.

Design of Parking Areas.

A. **Handicapped Parking.** All parking areas of less than twenty (20) spaces shall have **a minimum of** one (1) handicapped parking space. Parking areas with more than twenty (20) spaces shall provide **a minimum of** one (1) handicapped parking space for every fifty (50) standard parking spaces.

B. **Parking Bays.** All parking areas shall be divided into bays of not more than twenty (20) parking spaces. Between and at the end of each parking bay there shall be planters with minimum dimensions of five (5) feet by seventeen (17) feet. Each planter shall contain one major tree and ground cover. Truck loading areas are not subject to the requirement for parking bays.

C. **Landscape Strip**. Parking areas shall be separated from the exterior wall of a structure, exclusive of paved pedestrian ways, by a five (5) foot wide landscaping strip.

D. **Setback and Screening from Residential Districts**. Parking areas which abut a residential district shall meet the building setback of the most restrictive adjoining district. A parking area abutting a residential district shall be screened by a sight obscuring planting.

E. **Setback from Street**. Parking areas shall be setback from a lot line adjoining a street. The setback area shall be landscaped.

F. **Landscaping.** A minimum of ten (10) percent of the parking areas shall be landscaped and the maintenance of the landscaping shall be the owner's responsibility.

MINIMUM PARKING REQUIREMENTS

Residential Uses	**Spaces Required**
Single Family Dwelling	2 spaces per dwelling unit
Two Family Dwelling	2 spaces per dwelling unit
Multi Family Dwelling	2 spaces per dwelling unit, plus 1 visitor space per each five (5) units
Motel or Hotel	1 space for each guest room
Mobile Home Park	2 spaces per each mobile home space
Nursing/Convalescent Home	1 space for each four (4) beds, plus 1 space for each two (2) employees
Public and Semi-Public Buildings and Uses	**Spaces Required**
Auditorium/Meeting Room	1 space for each 60 feet of floor area
Churches	1 pace for each 80 feet of floor area
Hospital	1 space for each two (2) beds
High School	1 space for each ten (10) classroom seats
Elementary/Junior High Schools	1 space for each twelve (12) classroom seats
Kindergarten, Day Care	1 space for each two (2) employees
Retail Uses	**Spaces Required**

Grocery, Department Store	1 space per 400 square feet Gross Leasable Area (GLA)
Service & Repair Shop	1 space per 600 square feet GLA
Bulk Merchandise Retail	1 space per 600 square feet GLA
Bank or Office (includes medical/dental)	1 space per 300 square feet GLA
Restaurant, Tavern or Bar	1 space per 100 square feet GLA
Loading Space for Commercial Uses	1 space per 25,000 square feet. GLA

Industrial Uses	**Spaces Required**
Manufacturing	1 space for each two (2) employees on largest shift
Wholesale/Storage	1 space for each 5,000 square feet GLA
Loading Space for Industrial Uses	1 space per 40,000 sq. ft. GLA

Unspecified Uses

Any use not specifically listed shall provide the requirements deemed equivalent or appropriate by the Planning Commission.

Bicycle Parking Spaces

Bicycle parking spaces shall be provided in accordance with the following:

A Multi-Family Residences. Every residential use of four (4) or more dwelling units shall provide at least one sheltered bicycle parking space for every 2 units. Sheltered bicycle parking spaces may be located within a garage, storage shed, basement, utility room or similar area. In those instances in which the residential complex has no garage or other easily accessible storage unit, the required bicycle parking spaces shall be sheltered under an eave, overhang, an independent structure, or similar cover.

B. Parking Lots. All public and commercial parking lots and parking structures shall provide a minimum of one bicycle parking space for every 10 motor vehicle parking spaces.

C. Schools. Elementary and middle schools, both private and public, shall provide one bicycle parking space for every 10 students and employees. High schools shall provide one bicycle parking space for every 5 students and employees. All spaces shall be sheltered under an eave, overhang, independent structure, or similar cover.

D. Colleges. Colleges, universities, and trade schools shall provide one bicycle parking space for every 10 motor vehicle spaces plus one space for every dormitory unit. Fifty percent of the bicycle parking spaces shall be sheltered under an eave, overhang, independent structure, or similar cover.

E. Downtown Areas. In downtown areas with on-street parking, bicycle parking for customers shall be provided along the street at a rate of at least one space per use. Spaces may be clustered to serve up to six (6) bicycles; at least one cluster per block shall be provided. Bicycle parking spaces shall be located in front of the stores along the street, either on the sidewalks in specially constructed areas such as pedestrian curb extensions. Bicycle parking shall not interfere with pedestrian passage, leaving a clear area of at least 5 feet. Customer spaces are not required to be sheltered.

SECTION 5.16: APPROVAL REQUIREMENTS FOR TRANSPORTATION IMPROVEMENTS

Uses Permitted Outright. Except where otherwise specifically regulated by this ordinance, the following transportation improvements are permitted outright in all zones:

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

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

C. Projects specifically identified in the Transportation System Plan as not requiring further land use regulation.

D. Landscaping as part of a transportation facility.

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

F. Acquisition of right-of-way for public roads, highways, and other transportation improvements designated in the Transportation System Plan except for those that are located in exclusive farm use or forest zones.

G. Construction of a street or road as part of an approved subdivision or land partition approved consistent with the applicable land division ordinance.

Conditional Uses

E. Stabilize and improve property values.

Application. The applicant shall a completed application form and required fee, together with the following information, to initiate the design review process.

A. A site plan, drawn to scale, indicating the location of all existing and proposed structures, public and private streets, driveways, natural features, landscaping, parking and loading spaces, fencing/screening, and proposed plans for lighting and signs.

B. Architectural drawings or sketches, drawn to scale, showing all elevations and exterior materials of the proposed structures.

C. For developments that are likely to generate more than 400 average daily motor vehicle trips (ADTs), the applicant shall provide adequate information, such as a traffic impact study or traffic counts, to demonstrate the level of impact to the surrounding street system.

Planning Commission Authority. The Planning Commission may approve, approve with conditions, or deny the application for design review. In approving a design review application, the Planning Commission may impose condition found necessary to protect the best interests of the surrounding property or neighborhood, or the City as a whole.

Notice and Hearing. A public hearing shall be scheduled before the Planning Commission for the design review. The hearing shall be conducted in accordance with the notice, hearing and appeal procedures of Article 7.

Criteria. In order to grant Design Review Approval, the Planning Commission shall make findings of fact to support the following conclusions:

A. That the public and private facilities and services provided by the development are adequate to serve the residents or establishments and meet City standards.

B. That adequate right-of-way and improvements to streets and pedestrian ways are provided by the development in order to promote safety and reduce congestion. (This determination of impact or effect should be coordinated with the provider of the affected transportation facility, **if** such provider is not the City of Rainier.)

C. That there is a safe and efficient circulation pattern within the boundaries of the site and adequate off-street parking and loading facilities provided in a safe, well designed and efficient manner.

D. That adequate means are provided to ensure continued maintenance of private common areas.

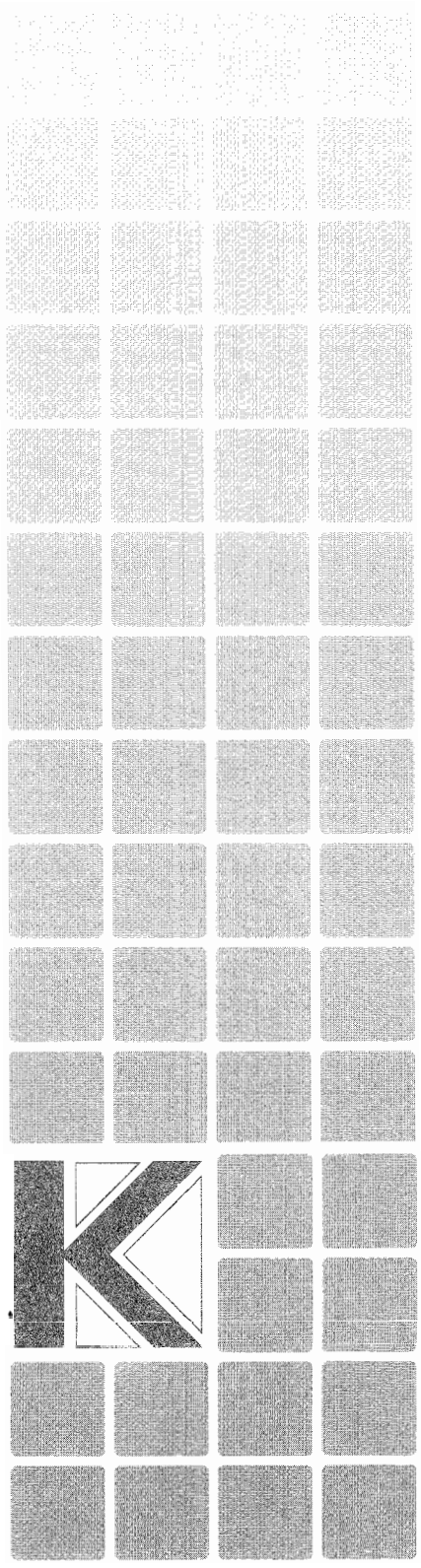
E. That there is a desirable, efficient and workable interrelationship among buildings, parking, loading areas, circulation, open spaces, landscaping and related activities and uses on the site.

F. That grading and contouring of the site will minimize the possible adverse effect of grading and contouring on the natural vegetation and physical appearance of the site.

G. That the proposed location and design of walls, fences, berms, signs, and lighting does not adversely impact surrounding properties.

Termination of Approval. Design review approval shall become void two years after the date of final approval unless prior to that time a building permit has been issued for the project and substantial construction has taken place.

Concurrent Hearings. An application for Design Review may be made at the same time as another land use application. In such a case the Planning Commission may hold one public hearing and consider the applications concurrently.



Appendix A

Glossary of Transportation Terms

APPENDIX A

GLOSSARY OF TRANSPORTATION/LAND USE TERMS

Access

A means of approach to provide vehicular or pedestrian entrance or exit to a property. This may not necessarily include all movements.

Access Classification

A ranking system for roadways used to determine the appropriate degree of access management. Factors considered include functional classification, the appropriate local government's adopted plan for the roadway, subdivision of abutting properties, and existing level of access control.

Access Management

The process of providing and managing access to land development while preserving the regional flow of traffic in terms of safety, capacity, and speed.

Access Spacing

The distance between access locations, measured from the closest edge of pavement of the first access to the closest edge of pavement of the second access along the edge (either side) of the traveled way.

Arterial

This classification of roadway provides for through traffic movement between areas and across the city with direct access to abutting property. It is subject to required control of entrances, exits, and curb use.

Bus

A heavy vehicle involved in the transportation of groups of people on a for-hire, charter, or franchised transit basis. Buses are further categorized as intercity or local transit buses. Intercity buses operate in a traffic stream without making stops to pick up or discharge passengers on a subject roadway facility. Local transit buses make such stops within the confines of the subject roadway facility.

Capacity

The maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions.

Collector

This classification of roadway provides for traffic movement between major arterials and local streets, with direct access to abutting property.

Conditional Access

An access granted to a parcel that will be relocated or eliminated at the time alternative access is provided.

Control Conditions

The types and specific design of control devices and traffic regulations present on a given facility. The location, type, and timing of traffic signals are critical control conditions affecting capacity. Other important controls include STOP and YIELD signs, lane use restrictions, turn restrictions, and similar measures.

Crossover Easement (Access)

A legal agreement that allows for access to one parcel through the access of another.

Deed

A legal document conveying ownership of real property.

Delay

The time lost while traffic is impeded by some element over which the driver has no control.

Directional Distribution

The directional split of traffic during the peak or design hour, commonly expressed as percent in the peak and off-peak flow directions.

Diverging

The dividing of a single stream of traffic into two or more separate streams.

Easement

A grant of one or more property rights by a property owner to or for use by the public or another person or entity.

External Station

The representation of a major port of entry or exit to the study area in the travel model simulation network.

Facility Type

Roadway facilities are generally classified into one of two categories: 1) *Uninterrupted flow facilities* have no fixed elements, such as traffic signals, external to the traffic stream that cause interruptions to traffic flow. Traffic flow conditions are the result of interactions among vehicles in the traffic stream, and between vehicles and the geometric and environmental characteristics of the roadway. 2) *Interrupted flow facilities* have fixed elements causing periodic interruptions to traffic flow. Such elements include traffic

signals, stop signs, and other types of controls. These devices cause traffic to periodically stop (or significantly slow) irrespective of how much traffic exists.

Fixed-Route Transit

Fixed route transit is the technical term used to describe what typically is thought of a "bus route". Fixed route transit operates on a defined, published route with a described schedule. In comparison, *demand-responsive transit* operates within a defined area responding to the call of the transit rider; "dial-a-ride" is an example of demand-responsive transit service and taxis are a private-sector example of demand-responsive transit.

Flow Rate

The equivalent hourly rate at which vehicles pass over a given point or section of a lane or roadway during a given time interval less than one hour, usually 15 minutes.

Functional Classification

A system used to group public roadways into classes according to their purpose in moving vehicles and providing access.

Grade Separation

A crossing of two highways, or a highway and a railroad, at different vertical levels. This may include an *overpass*, in which the subject facility passes over an intersecting highway or railroad; and an *underpass*, in which the subject facility passes under an intersecting highway or railroad.

Interchange

A system of interconnecting roadways in conjunction with one or more grade separations, providing for the movement of traffic between two or more roadways on different levels.

Intersection

The general area where two or more highways join or cross, within which are included the roadway and roadside facilities for traffic movements in that area.

Joint Access (or Shared Access)

A driveway connecting two or more contiguous sites to the public street system.

Lot

A parcel, tract, or area of land with boundaries that have been established by some legal instrument. A lot is recognized as a separate legal entity for purposes of transfer of title, has frontage on a public or private street, and complies with the dimensional requirements of property codes.

Land Use

The type of activity associated with a specific geographic area. Land use categories can be broad (e.g., residential, retail, office, industrial, and recreational) or they can be very specific (e.g., single family residential, convenience market, or elementary school). In order to estimate trip generation characteristics for a specific geographic area, it is necessary to know both the type and intensity of land use (e.g., single family residential land use at a development intensity of eight units per acre).

Level of Service

A qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. A level of service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Six levels of service are defined with letter designations, from A to F. Level of service A represents the best operation conditions and level of service F the worst. Level of Service D represents the level that is normally considered, for signalized intersections, near the minimum acceptable for an urban area, level of service E represents operating conditions at or near the capacity level, and level of service F is used to define forced or breakdown flow conditions. See appendix for full definitions of level of service.

Local Street

This classification of roadway provides for direct access to abutting land and for local traffic movement.

Mode

The means by which travel is accomplished. Alternative modes of travel include walking, bicycling, auto, bus, and light rail.

Right-of-Way

A publicly-owned strip of land within which the entire road facility (including travel lanes, medians, shoulders, sidewalks, planting areas, bicycle lanes, and utility easements) must reside. The right-of-way is usually defined in feet, and it is not necessary that the paved roadway be centered within this strip of lane.

Roadway Conditions

The geometric characteristics of the street or highway, including: the type of facility and its development environment, the number of lanes (by direction), lane and shoulder widths, lateral clearances, design speed, and horizontal and vertical alignments.

Speed

A rate of motion expressed as distance per unit time, generally as miles per hour or kilometers per hour. In characterizing the speed of a traffic stream, some representative value must be used, as there is generally a broad distribution of individual speeds that may be observed in the traffic stream. The speed measure that is normally used in this regard is *average speed.* Average travel speed is computed by

dividing the length of the highway or street segment under consideration by the average travel time of vehicles traversing the segment.

Travelshed

A geographic area that is relatively homogeneous with respect to the type of land use activities that exist or are allowed. Taken together, travelsheds define all land area within the study area. The boundaries of travelsheds can be defined somewhat arbitrarily. However, they are usually similar in size to one another, and they are typically not bisected by significant roadways or transportation barriers (e.g., rivers or lakes). In a travelshed, an area of aggregate land uses is identified for the purpose of determining trip generation in a travel forecasting model. Traelsheds group together a number of housing units or employees (by type) in an area instead of single trip generators (one dwelling unit, an office building, shopping center, etc.).

Traffic Conditions

The characteristics of the traffic stream using the facility. This is defined by the distribution of vehicle types in the traffic stream, the amount and distribution of traffic in available lanes of a facility, and the directional distribution of traffic.

Traffic Control Device

A sign, signal, marking or other device placed on or adjacent to a street or highway by authority of a public body or official having jurisdiction to regulate, warn, or guide traffic.

Travel Demand Forecasting

The practice of predicting the future demand for travel on a particular physical transportation system. To be useful, these forecasts must incorporate estimates of the *amount* of travel that will occur (i.e., the trip generation potential), the *distribution* of that travel (i.e., the ultimate destination of each generated trip), and the *mode* by which the travel occurs (i.e., auto, bus, light rail, or walking/bicycling).

Trip Assignment

The allocation of all travel between a particular origin and a particular destination to the alternative available travel routes. Usually, trip assignment procedures attempt to assign traffic to the most direct route between a specific origin and destination pair that minimizes total travel time and avoids significant congestion.

Trip Distribution

The allocation of generated trips among all possible destinations.

Trip Assignment

The allocation of all travel between a particular origin and a particular destination to the alternative available travel routes. Usually, trip assignment procedures attempt to assign traffic to the most direct route between a specific origin and destination pair that minimizes total travel time and avoids significant congestion.

Trip End

A one-way vehicular movement between a single origin and a single destination. Thus, for example, a round trip between home and a shopping center would consist of two trip ends: one trip end is defined by the vehicular travel from home to the shopping center, and the other trip end is defined by the vehicular travel from the shopping center to home.

Trip Generation

The number of vehicle trip ends produced by a specific type and intensity of land use. Normally, trip generation characteristics are estimated on a daily and/or a peak hour basis.

Trucks (Heavy Vehicles)

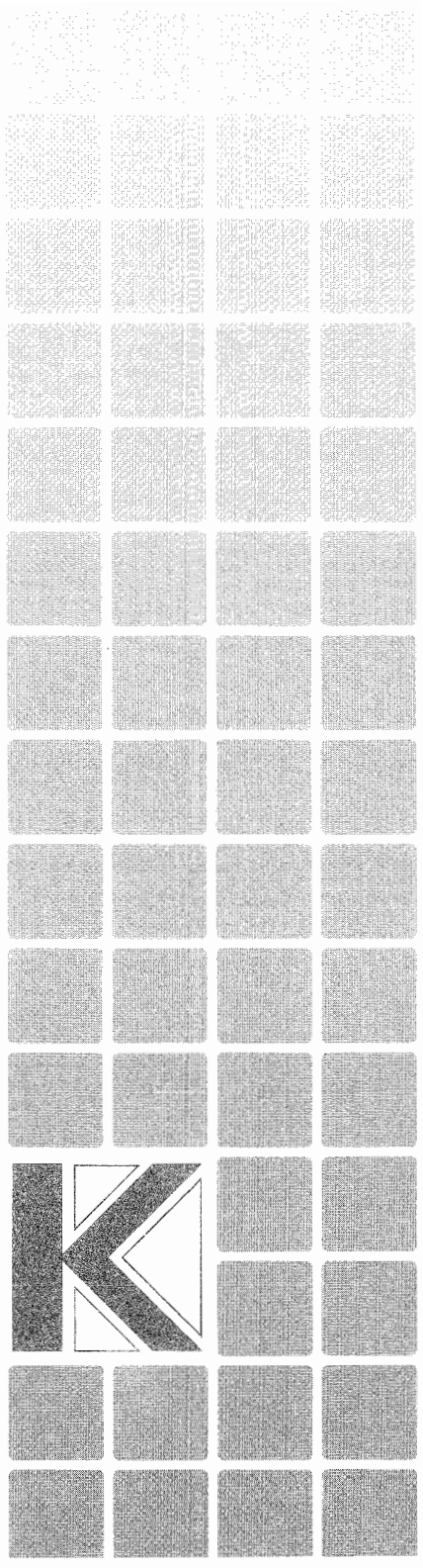
Any vehicle with more than four tires on the roadway that is not otherwise classified as a recreational vehicle or a bus.

Urban Growth Boundary (UGB)

The politically-defined boundary around a metropolitan area outside of which no urban activities may occur. It is intended that the UGB be defined so as to accommodate all projected population and employment growth within a twenty-year planning horizon. A formal process has been established for periodically reviewing and updating the UGB so that it accurately reflects projected population and employment growth.

Volume

The total number of vehicles that pass over a given point or section of a lane or roadway during a given time interval; volumes may be expressed in terms of annual, daily, hourly, or sub-hourly periods.



Appendix B

Stakeholder Concerns

APPENDIX B

STAKEHOLDER CONCERNS

Project 1795

Issues from Technical Advisory Committee
Wednesday January 24, 1996 7:00 pm
Representation required?: Fire Marshall/ City Police

Regional/MPO Issues:

1 High speed rail corridor - 17 trips a day through Kelso by 2015 - cross river connection will be required.
2 US 30 Study identified the need for a bus connection between Portland and Astoria.
3 Pressure for rail-oriented development and rail traffic growth along US 30 corridor.
4 Potential for rail crossing on a replacement bridge.
5 Signing required on I-5 for Longview Bridge as a route to the Coast.
6 Development proposal in Clatskanie has potential to generate a significant increase in truck traffic on US 30.
7 Some westside connection required between US 30 and I-5 to the south of Portland or between US 26 and US 30 - 217 extension, Cornelius Pass Road or other.
8 Rainier-Longview-Kelso MPO is updating their TSP to be adopted by September 1996. These studies can mutually benefit from one another.
9 Longview studies for Highway 432 corridor and new rail corridor (to replace the need to grade separate Highway 432) should be noted.
10 Burlington Northern/Santa Fe merge will have some significant effects in the near term future.

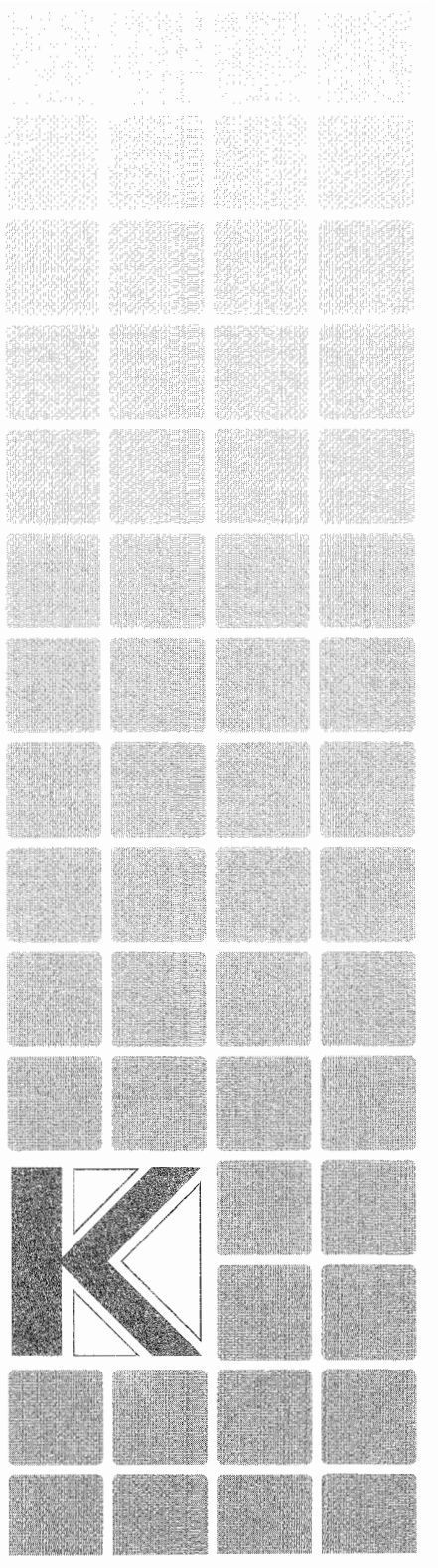
Local Rainier Issues:

1 Downtown parking - possibility of City owned lots, or development of private lots.
2 Extension of A Street to the west - necessary for livability and to ensure continued vitality of the downtown as development occurs to the west.
3 Any highway widening will compound the barrier effect within the City.
4 Need for improved sidewalks downtown, additional legal pedestrian crossing opportunities - enhanced pedestrian safety required (crossing to the park).
5 Eliminating access onto US 30 from side streets is dangerous from the perspective of emergency vehicle access.
6 Possibility of extending A St to the east to connect with US 30 and possibly form a couplet.
7 Safe truck access required at West 6th Street, Mill Street and Rockcrest Street.
8 Rail safety - particularly on A Street.
9 Deep draft dock - a permit is held for a 605 foot dock.
10 Intermodal connections to support the dock - rail and truck facilities.

11 Look at possibility of C Street as couplet street. Nice Creek bridge replacement will be required.

12 Develop routes to Beaver Creek Valley for future developable lands.

13 Look at moving US 30 over to the north of ROW between west 5th and 7th Streets to straighten out the curve at that location.



Appendix C

Level of Service Description

APPENDIX C

LEVEL OF SERVICE CONCEPT

Level of service (LOS) is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various LOS from A to F.[1]

Table A-1

Level of Service Definitions (Signalized Intersections)

Level of Service	Traffic Flow Characteristics
A	Very low average stopped delay, less than five seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Average stop delay is in the range of 5.1 to 15.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Average stopped delay is in the range of 15.1 to 25.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Average stopped delays are in the range of 25.1 to 40.0 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Average stopped delays are in the range of 40.1 to 60.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.
F	Average stop delay is in excess of 60 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation. It may also occur at high volume/capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay levels.

[1]Most of the material in this appendix is adapted from the Transportation Research Board, *Highway Capacity Manual,* Special Report 209 (1985).

Signalized Intersections

The six LOS grades are described qualitatively for signalized intersections in Table A-1. Additionally, Table A-2 identifies the relationship between level of service and average stopped delay per vehicle. Using this definition, LOS D is generally considered to represent the minimum acceptable design standard.

Table A-2

Level of Service Criteria for Signalized Intersections

Level of Service	Stopped Delay per Vehicle (sec)
A	<= 5.0
B	5.1 to 15.0
C	15.1 to 25.0
D	25.1 to 40.0
E	40.0 to 60.0
F	> 60.0

Unsignalized Intersections

The calculation of LOS at an unsignalized intersection requires a different approach. The *1985 Highway Capacity Manual* includes a methodology for calculating the LOS at two-way, stop-controlled intersections. For these unsignalized intersections, LOS is defined using the concept of "reserve capacity" (i.e., that portion of available hourly capacity that is not used). A qualitative description of the various service levels associated with an unsignalized intersection is presented in Table A-3. A quantitative definition of LOS for an unsignalized intersection is presented in Table A-4.

Table A-3

Level of Service Definitions (Unsignalized Intersections)

LOS	General Description
A	• Average delay per vehicle ranges between 0 and 10 seconds • Nearly all drivers find freedom of operation • Very seldom is there more than one vehicle in the queue
B	• Average delay per vehicle ranges between 10 and 20 seconds • Some drivers begin to consider the delay an inconvenience • Occasionally there is more than one vehicle in the queue
C	• Average delay per vehicle ranges between 20 and 30 seconds • Many times there is more than one vehicle in the queue • Most drivers feel restricted, but not objectionably so
D	• Average delay per vehicle ranges between 30 and 40 seconds • Often there is more than one vehicle in the queue • Drivers feel quite restricted
E	• Represents a condition in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement • Average delay per vehicle ranges between 40 and 60 seconds • There is almost always more than one vehicle in the queue • Drivers find the delays approaching intolerable levels
F	• Forced flow • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection

Table A-4

Level-of-Service Criteria for Unsignalized Intersections

Reserve Capacity (pcph)	Level of Service	Expected Delay to Minor Street Traffic
≥ 400	A	Little or no delay
300-399	B	Short traffic delays
200-299	C	Average traffic delays
100-199	D	Long traffic delays
0-99	E	Very long traffic delays
*	F	*

pcph: passenger cars per hour
*When demand volume exceeds the capacity of the lane, extreme delays will be encountered, with queuing that may cause severe congestion and affect other traffic movements in the intersection. This condition usually warrants intersection improvement.

The reserve capacity concept applies only to an individual traffic movement or to shared lane movements. Once the LOS, capacity, and expected delay of all the individual movements have been calculated, an overall evaluation of the intersection can be made. Normally, the movement having the worst LOS defines the overall evaluation, but this may be tempered by engineering judgment. An "E" LOS is generally considered to represent the minimum acceptable design standard.

Experience with the unsignalized analysis procedure indicates this methodology is conservative in that it tends to overestimate the magnitude of any potential problems. This is especially true for minor-street, left-turn movements. For example, the *Highway Capacity Manual* methodology does not take into account the effects of vehicle flow platoons that result from upstream signalization. Vehicles traveling in platoons tend to create greater gaps in the traffic flow, which sometimes provide additional capacity for the side closest to the signal. Therefore, the results of any unsignalized intersection analysis should be reviewed with this thought in mind. Generally, LOS E for the minor-street, left-turn movement is considered to be acceptable for an unsignalized intersection, although it also indicates that the need for signalization should be investigated.

All-Way Stop-Controlled Intersections[2]

There is no accepted procedure for a level-of-service analysis of an all-way, stop-controlled intersection. The procedure used for determining LOS for a four-way or three-way stop-controlled intersection differs from that described for unsignalized intersections. This methodology, which is being reviewed by the Unsignalized Intersection Committee of the Transportation Research Board, uses a capacity estimation method based on headways observed at all-way, stop-controlled intersections in the western United States. The procedure incorporates several important variables, including volume distribution, number of lanes on each approach, and the percentage of right and left turns at the intersection. Intersection performance is measured in parameters similar to signalized intersections: delay, volume-to-capacity ratio, and Level of Service using a scale of "A" through "F." Approach delay on any given leg of the intersection is calculated using the following equation:

$$D=\exp(3.8*\frac{SV}{C})$$

Where D = vehicle delay on a given approach (sec/veh),
SV = subject approach volume (vehicles per hour),
C = calculated approach capacity (vph), and
exp = base of natural logarithms

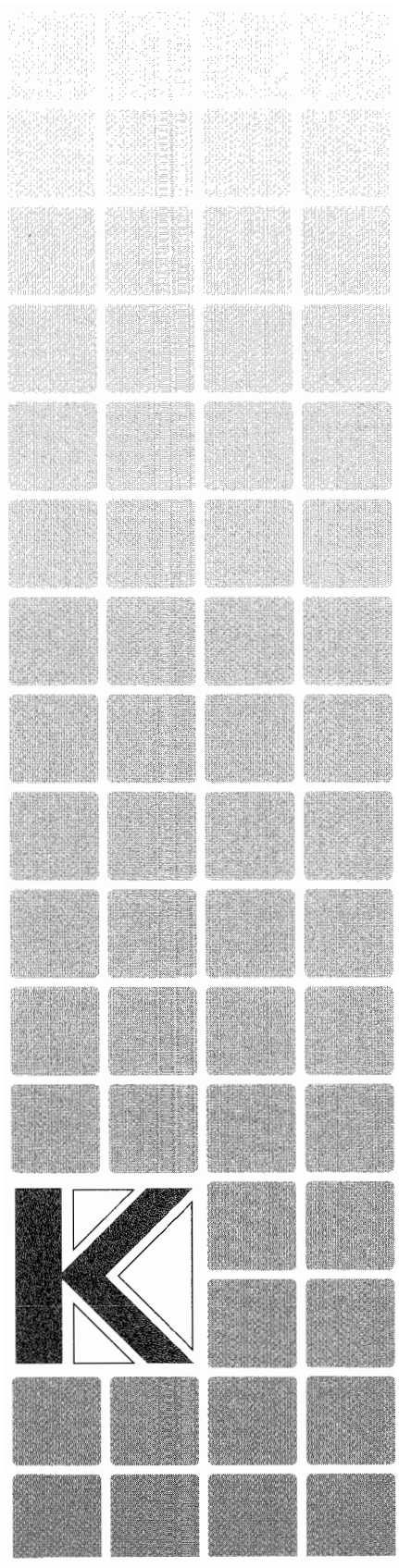
In this equation, the quantity SV/C is simply the volume-to-capacity ratio on the approach under consideration. Table A-5 presents the LOS criteria for all-way stop-controlled intersections.

Table A-5

Level of Service Definitions (All-Way Stop-Controlled Intersections)

Level of Service	Average Delay to Minor Street Vehicle
A	<5 seconds
B	5 to 10 seconds
C	10 to 20 seconds
D	20 to 30 seconds
E	30 to 45 seconds
F	>45 seconds

[2]Kyte, Michael, *Estimating Capacity and Delay at an All-Way Stop-Controlled Intersection.* University of Idaho, Department of Civil Engineering Research Report, September 1989.

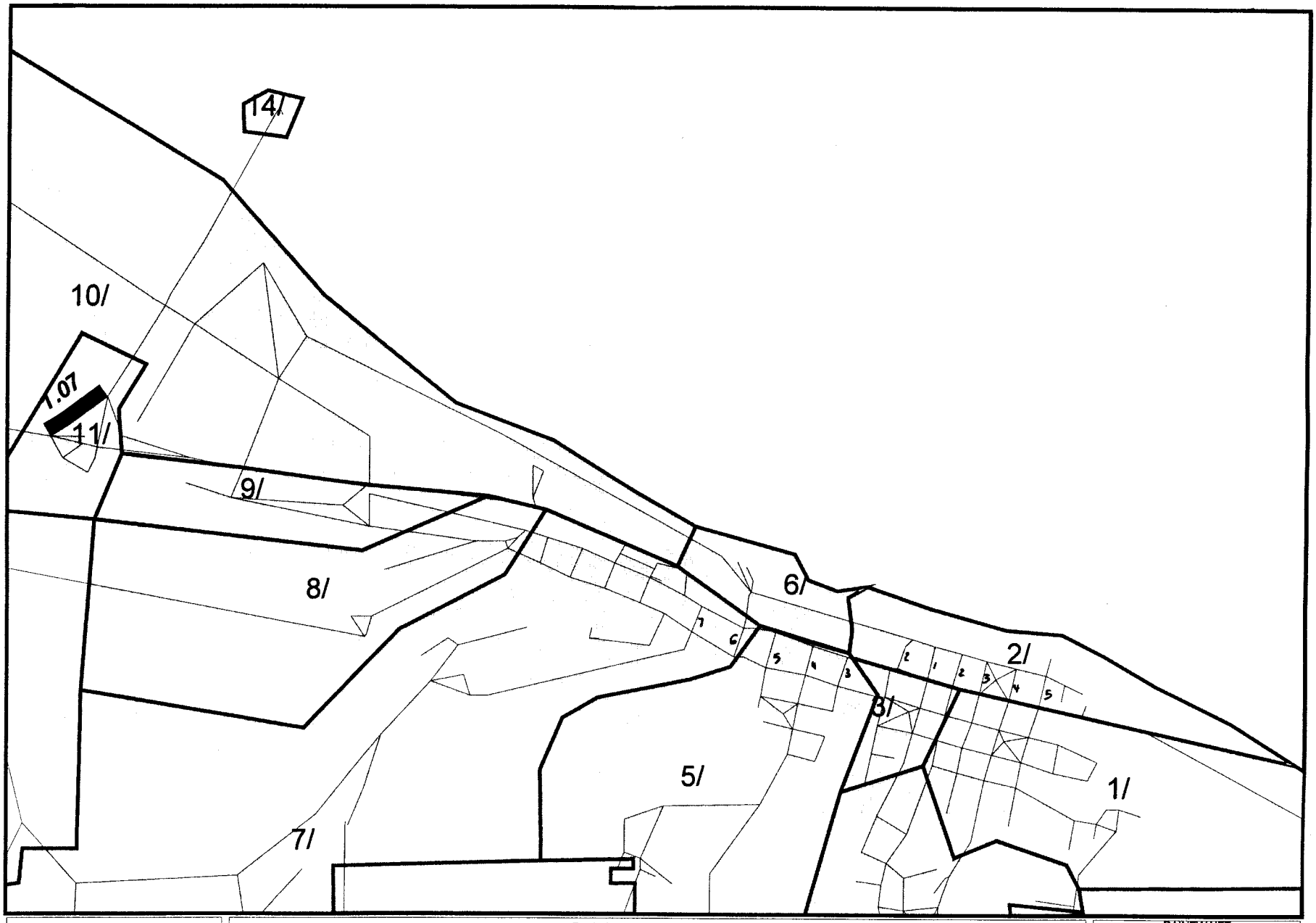


Appendix D

UFOSNET Modeling Results

APPENDIX D

UFOSNET Modeling Results



Miles/Inch

0 0.13 0.26

UfosNet 2.1 [Trial]

Rainier 2016 Scenario

Volume/Capacity >1

2% through trip growth

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RAINIER.ZBY

6:15:02 PM Thu 8/08/96
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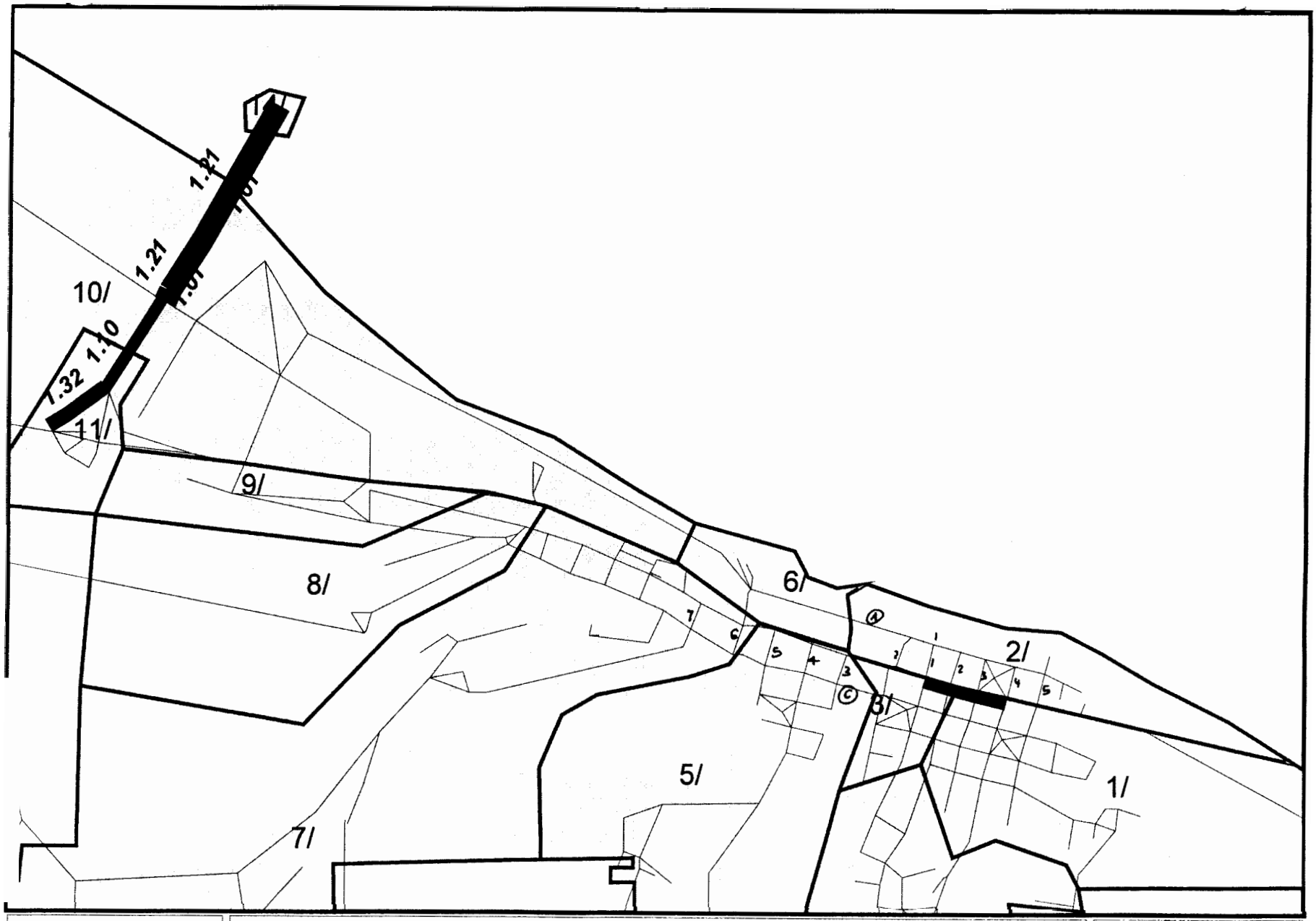
LR: -122919129/46082718



Miles/Inch

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UfosNet 2.1 [Trial]

Rainier 2016 Scenario

Volume/Capacity >1

3.5% through trip growth

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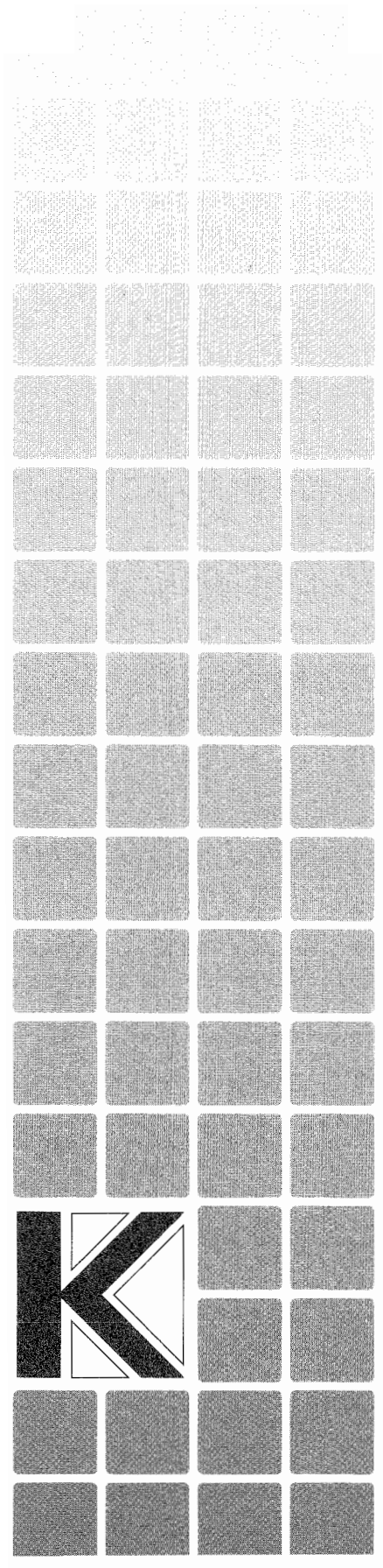

Appendix E

Cost Estimates

APPENDIX E

COST ESTIMATES

City of Rainier TSP Cost Estimates
Proj No. 1795

A Street Improvement Plan

ROAD CONSTRUCTION PROJECTS

#	Facility	Begin	End	Note	Sched	Length	X-Section W		A	Cost/sf	Conting	COST	Period 1	Period 2
1	A Street	W 2nd	Rockcrset	New Con	1	6,900	3ln, bikes,	42.0	289,800	8.00	1.20	2,782,080	2,782,080	0
2	C Street	E 5th	Rockcrest	Upgrade	2	2,000	2 lane	22.0	44,000	8.00	1.10	387,200	0	387,200
3	C St Bridge			L.S.	2				1	1700000	1.00	1,700,000	0	1,700,000
4	C St/Fernhill Intersection			L.S.	2	1,000	2 lane	24.0	24,000	8.00	1.30	249,600	0	249,600
8	Parking Lot		"A"/2nd		1	100		100	10,000	8.00	1.10	88,000	88,000	0
**	Dike Roa	Mill St	UGB	Recon	1	8,000	2ln(bike)	24	192,000	8.00	1.10	1,689,600	1,689,600	0
**	Rockcrest	US 30	Dike Rd	Recon	1	800	2ln(bike)	24	19,200	8.00	1.10	168,960	168,960	0
**	Mill St	US 30	Rockcrest	Recon	1	300	2ln(bike)	24	7,200	8.00	1.10	63,360	63,360	0
9	Powerline Road Alignment				2	3,250	2 lane	34	110,500	8.00	1.10	972,400	0	972,400

SIGNAL PROJECTS

#	Facility	Begin	End	Note	Sched					Conting	COST	Period 1	Period 2
5	First Ave	signal improvement			2				30,000	1.00	30,000	0	30,000
7	Rockcrest	signal improvement			2				30,000	1.00	30,000	0	30,000
6	W 6th Av	new signal			1				150,000	1.00	150,000	150,000	0
												0	0
												0	0

Grand Total	8,311,200	4,942,000	3,369,200

City of Rainier TSP Cost Estimates
Proj No. 1795

B Pedestrian Plan Improvements

NEW SIDEWALKS

#	Facility	Begin	End	# Sides	Schedule	Linear Fe	W	A	Cost/sf	Conting	COST	Period 1	Period 2
1	US 30	E 7th	W 6th	2	1	4,600	5.00	23,000	4.00	1.10	101,200	101,200	0
2	A Street	W 2nd	Rockcrest	2	1	14,000	5.00	70,000	4.00	1.10	308,000	308,000	0
3	E Street	E 2nd	E 10th	2	1	4,000	5.00	20,000	4.00	1.10	88,000	88,000	0
4	Downtown Grid		Infill	2	1	8,000	5.00	40,000	4.00	1.10	176,000	176,000	0
5	DeBast R	E St	Sandy Ln	1	1	2,500	5.00	12,500	4.00	1.10	55,000	55,000	0
6	E 2nd St	E St	Watershe	2	1	3,400	5.00	17,000	4.00	1.10	74,800	74,800	0
7	Fernhill R	C St	Riverview	1	1	2,900	5.00	14,500	4.00	1.10	63,800	63,800	0
8	C Street	W 5th	Rockcrest	2	2	10,000	5.00	50,000	4.00	1.10	220,000	0	220,000
9	Dike Roa	UGB	Mill St	1	2	8,000	5.00	40,000	4.00	1.10	176,000	0	176,000
10	Rockcrest	Dike Rd	US 30	2	2	1,600	5.00	8,000	4.00	1.10	35,200	0	35,200
11	Mill St	Dike Rd	US 30	2	2	600	5.00	3,000	4.00	1.10	13,200	0	13,200

UPGRADE/REPLACE EXISTING SIDEWALKS

#	Facility	Begin	End	# Sides	Schedule	Linear Fe	W	A	Cost/sf	Conting	COST	Period 1	Period 2
12	US 30	E 7th	W 6th	2	1	3,000	5.00	15,000	4.00	1.10	66,000	66,000	0
13	Downtown Grid		Infill	2	1	3,000	5.00	15,000	4.00	1.10	66,000	66,000	0
14	E 5th St	A Street	E Street	2	1	1,800	5.00	9,000	4.00	1.10	39,600	39,600	0

TRAILS

#	Facility	Begin	End	# Sides	Schedule	Linear Fe	W	A	Cost/sf	Conting	COST	Period 1	Period 2
15	Riverfront	E 3rd	Rockcrest	2	1	4,500	10.00	45,000	4.00	1.10	198,000	198,000	0
16	W 3rd	D St	E St		1	250	10	2,500	4.00	1.10	11,000	11,000	0

PEDESTRIAN CROSSING

#	Facility	Begin	End	# Sides	Schedule	Linear Fe	W	A	Cost/sf	Conting	COST	Period 1	Period 2
17	Ped X-ing	W 6th	Park								Incl in Signal		

	TOTALS										1,691,800	1,247,400	444,400

City of Rainier TSP Cost Estimates
Proj No. 1795

C Bicycle Plan Improvements

ON-STREET BIKE LANES

#	Facility	Begin	End	Schedule	Linear Fee	W	A	Cost/sf	Conting	COST	Period 1	Period 2	NOTE
1	US 30/B Street	UGB	UGB	1	4,600	0.00	0	8.00	1.10	0	0	0	ODOT Project
2	A Street					0.00	0	8.00	1.10	0	0	0	In Street costs
3	Dike Road	Mill St	UGB	2	8,000	8.00	64,000	8.00	1.10	563,200	0	563,200	
4	Rockcrest St	A St	US 30	2	800	8.00	6,400	8.00	1.10	56,320	0	56,320	
5	Mill St	Dike Rd	US 30	2	300	8.00	2,400	8.00	1.10	21,120	0	21,120	
6	E 2nd St	A St	E St	1	1,200	8.00	9,600	8.00	1.10	84,480	84,480	0	
7	W 4th	A St	F St	1	1,200	8.00	9,600	8.00	1.10	84,480	84,480	0	

SIGNED BIKE ROUTES

#	Facility	Begin	End	Schedule	Signs	Cost/foot	Conting	COST	Period 1	Period 2	NOTE
8	DeBast Rd	F St	Sandy Ln	1	4	311.50	1.10	1,371	1,371	0	
9	Old Rainier Rd	Meserve	C St	1	4	311.50	1.10	1,371	1,371	0	

BICYCLE TRAILS

#	Facility	Begin	End	Schedule	Linear Fee	W	A	Cost/sf	Conting	COST	Period 1	Period 2	NOTE
10	Riverfront Trail	E 3rd	Rockcrest	1						0	0	0	Included in Ped Plan
11	W 3rd Street	D St	E St	1	250	10.00	2,500	0.00	1.10	0	0	0	Included in Ped Plan

BICYCLE PARKING FACILITIES

#	Location	Estimated No of Spaces		Cost/sp	Conting	COST	Period 1	Period 2
12	Library/City Hall	5	1	35.00	1.1	193	193	0
13	Middle School	10	1	35.00	1.1	385	385	0
14	Elementary School	10	1	35.00	1.1	385	385	0
15	High School	20	1	35.00	1.1	770	770	0
16	Riverfront Park	15	1	35.00	1.1	578	578	0

	TOTALS					814,651	174,011	640,640