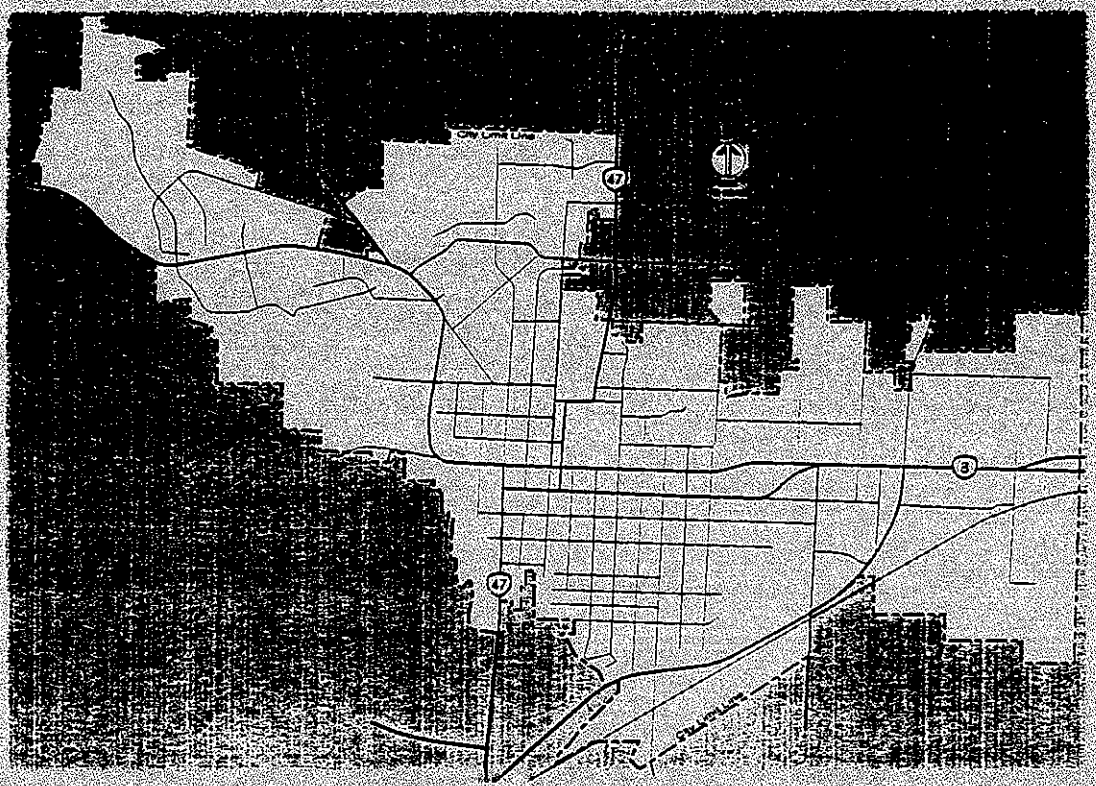
Report for

forest grove

Transportation System Plan

Draft Report



Prepared by

DKS Associates

July 1999

DKS Associates

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July 30, 1999

Lidwien Rahman
ODOT, Region 1
123 NW Flanders Street
Portland, OR 97209-4037

Subject: Draft Report Submittal for Forest Grove TSP

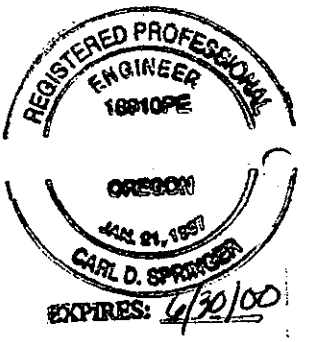
Dear Lidwien,

This letter covers the draft report and technical appendix for the above study accordance with our contract #163772, TGM Grant 1G-97. We have completed all of the plan elements, including the special assignment concerning possible connectors between Main Street and Sunset Drive as a follow-up to the Town Center planning. The Draft TSP outlines pla

We look forward to completing this assignment in a timely manner. We will forward electronic copies of all data files and a reproducible copy of the traffic model data to the city for their use. Please forward your comments and any forthcoming data for our use as it becomes available.

Sincerely,
DKS Associates, Inc.

Carl D. Springer, P.E.
Project Manager



Bob Tiernan, City of Forest Grove (20 copies)

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APPENDIX

A: TRANSPORTATION PLANNING RULE ANALYSIS
B: VISUAL SIMULATION OF PROPOSED TRANSPORTATION PROJECTS

(SEE SEPARATE TECHNICAL APPENDIX DOCUMENT FOR OTHER SUPPLEMENTAL INFORMATION)

Technical Advisory Committee

Michael Malone
Mark Nakajima
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Karl Mawson, City of Forest Grove
Bob Tiernan, City of Forest Grove
Rob Foster, City of Forest Grove
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Lidwein Rahman, ODOT
Kim White, Metro

This project was funded by the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development.

The TGM Program relies on funding from the federal Intermodel Surface Transportation Efficiency Act and the Oregon Lottery. This report does not necessarily reflect the view or policies of the State of Oregon.

Chapter 1: Summary

The Forest Grove Transportation System Plan (TSP) has been developed to bring an earlier 1987 City TSP into compliance with the Oregon Transportation Planning Rule. The plan is a multi-modal plan, addressing improvement to existing roadways, new pedestrian and bicycle facilities, improvement in public transit service, and transportation demand management (TDM) strategies. The plan also includes a transportation improvement program, as well as changes to Forest Grove codes and standards to implement the TSP recommendations.

The plan includes the following major components:

1. Modifications to the street functional classification system to reflect current street function and development patterns, in particular changes between the collector and neighborhood route designations for certain streets.
2. Modification to the city street standards, to include a narrower local street width option, the regional street design standards, and access spacing criteria.
3. Identification of signal system and intersection improvements, to increase capacity in the roadway system at traffic congestion locations.
4. Expansion of the city's system of pedestrian and bicycle facilities, with the objective of sidewalks or pathways for pedestrians on all collector and arterial streets, and bike lanes or bikeways on major collectors and arterials.
5. Extension of the public transit system, including additional bus shelters, park and ride lot, and a dial-a-ride service to feed to the central fixed route bus services.
6. Additional east-west street connections in the growing northwest sector of the city to replace lost opportunities carried over from past plans.

A total of 50 transportation improvement project have been identified to be implemented in Forest Grove over the 20 years, totaling about $40 million dollars (not including improvements to the Northern Highway 47 Bypass). Project have been prioritized for implementation for the short-term and long-term time frames. To achieve this program, new transportation funding soures – federal, state, and/or local – will be required. An added $10 million over the next 20 years (beyond the current funding programs) will be required.

The TSP is consistent with Metro's Regional Framework and Transportation Plans, Washington County Transportation Plan, and Tri-Met's Primary Transit Network Plan.

Chapter 2: Goals and Policies

Background

These goals and policies have been developed to guide the City's twenty year vision of transportation system needs. They are intended to replace the current transportation related goals and policies in the Forest Grove Comprehensive Plan. State Transportation Planning Rule requirements adopted since the time that the current City goals were developed call for a more comprehensive and balanced approach to transportation policy, addressing walking, bicycling, transit, rail, truck and other modes as well as automobile travel.

These goals and policies are a result of technical work by staff, the Forest Grove TSP Technical Advisory Committee and the consultant. Using input from the TAC regarding their likes/dislikes about transportation in Forest Grove, goals and policies were developed.

The City of Forest Grove Draft TSP Goals and Policies consist of seven goals with related policies organized under each goal. The goals are simple, brief guiding statements which describe a desired result. The policies focus on how goals will be met by describing the types of actions that will contribute to achieving the goal. Figure 2-1 provides an outline of the relationship between goals, policies, actions and implementation. The existing City of Forest Grove goals in the Transportation Element of the Comprehensive Plan have been incorporated into these Goals and Policies, reflecting other regional policy from the state, region and adjacent jurisdictions.

Below many of the policies, the italic text represents a detailed description about the intent of the policy. The italics are not intended to be policy and therefore could not be appealed as land use decisions. The Draft TSP Goals and Policies are linked to mode maps provided in the City of Forest Grove TSP. The TSP includes master plan maps for motor vehicles, pedestrians, bicycles, transit and other modes.

From Vision to Action
Forest Grove Transportation System Plan

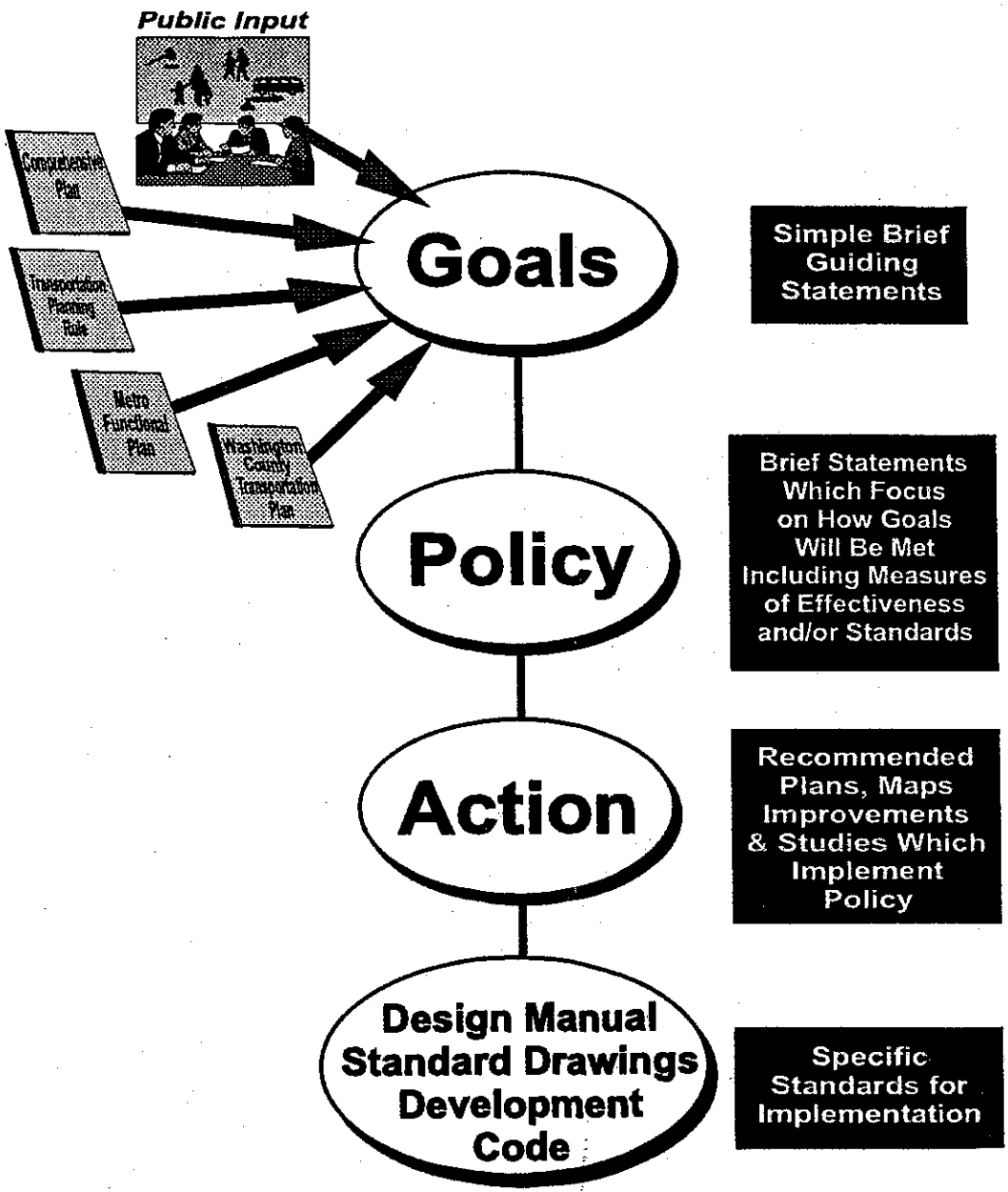


Figure 2-1
GOALS AND POLICIES RELATIONSHIP

Goals And Policies

Goal 1—Livability

Plan, design and construct transportation facilities in a manner which enhances the livability of Forest Grove.

Policy 1 Maintain the livability of Forest Grove through proper location and design of transportation facilities.

Design streets and highways to respect the characteristics of the surrounding land uses, natural features, and other community amenities.

Policy 2 Encourage pedestrian accessibility by providing safe, secure and desirable pedestrian routes.

The City will develop and maintain a pedestrian plan in Forest Grove, outlining pedestrian routes. Sidewalk standards will be developed to define various widths, as necessary, for City street types.

Policy 3 Protect neighborhoods from excessive through traffic and travel speeds while providing reasonable access to and from residential areas. Build local and neighborhood streets to minimize speeding.

Develop and maintain a program of street design standards and criteria for neighborhood traffic management for use in new development and existing neighborhoods. Measures to be developed may include narrower streets, speed humps, traffic circles, curb/sidewalk extensions, curving streets, diverters and/or other measures.

Policy 4 Relate the design of street capacity and improvements to their intended use.

A functional roadway classification system shall be developed for Forest Grove which meets the City's needs and is coordinated with County, Regional and State roadway classification systems. Appropriate design standards for roadways in the City should be coordinated and developed by the responsible jurisdiction.

Goal 2—Balanced Transportation System

Provide a balanced transportation system, incorporating all modes of transportation (Including motor vehicle, bicycle, pedestrian, transit and other modes).

Policy 1 Develop and implement public street standards that recognize the multi-purpose nature of the street right-of-way for utility, pedestrian, bicycle, transit, truck and auto use.

Develop and maintain a series of system maps and design standards for motor vehicles, bicycle, pedestrian, transit and truck facilities in Forest Grove.

Policy 2 The City shall coordinate with Tri-Met to improve transit service to Forest Grove. Fixed route transit will use arterial and collector streets in Forest Grove.

The Regional Transportation Plan (RTP) and Tri-Met service plan will be the guiding documents for development of Forest Grove's transit plan. The City

should provide input to Tri-Met regarding their specific needs as they annually review their system.

Policy 3 Bicycle lanes must be constructed on all arterials and collectors within Forest Grove (with construction or reconstruction projects). All schools, parks, public facilities and retail areas shall have direct access to a bikeway.

The City will develop a bicycle plan which connects key activity centers (such as schools, parks, public facilities and retail areas) with adjacent access. Standards for bicycle facilities within Forest Grove will be developed and maintained. Where activity centers are on local streets, connections to bicycle lanes shall be designated.

Policy 4 Sidewalks must be constructed on all streets within Forest Grove (with construction or reconstruction projects). All schools, parks, public facilities and retail areas shall have direct access to a sidewalk.

The City will develop a pedestrian plan which connects key activity centers with adjacent access. Standards for pedestrian facilities within Forest Grove will be developed and maintained.

Policy 5 Bicycle and pedestrian plans shall be developed which link to recreational trails.

The bicycle and pedestrian plans will need to indicate linkages between recreational and basic pedestrian networks. Design standards for recreational elements will need to be developed and maintained.

Policy 6 Local streets shall be designed to encourage a reduction in trip length by providing connectivity and limiting out-of-direction travel. Provide connectivity to activity centers and destinations with a priority for bicycle and pedestrian connections.

The purpose of this policy is to provide accessibility within Forest Grove, with a focus on pedestrian connectivity. Pedestrian connectivity can be provided via pedestrian/bike paths between cul-de-sacs and/or greenways where auto connectivity does not exist or is not feasible. Wherever necessary, new streets built to provide connectivity shall incorporate traffic management design elements, particularly those which inhibit speeding.

Policy 7 Forest Grove will participate in vehicle trip reduction strategies developed regionally.

DEQ and Metro are developing regional policies regarding trip reduction. Some of these policies are aimed at provision of parking and others are aimed at ridesharing (Employee Commute Options—ECO rules).

Goal 3—Safety

Strive to achieve a safe transportation system by developing street standards, access management policies and speed controls when constructing streets and by making street maintenance a priority.

Policy 1 Design of streets should relate to their intended use.

A functional classification system shall be developed for Forest Grove which meets the City's needs and respects needs of other agencies (Washington County, Metro, ODOT). Appropriate design standards for these roadways will be developed by the appropriate jurisdiction.

Policy 2 Street maintenance shall be a priority to improve safety in Forest Grove.

The City shall coordinate with Washington County for the maintenance of those facilities within the City maintained by the County

Policy 3 Safe and secure pedestrian and bikeways shall be designed between parks and other activity centers in Forest Grove.

Policy 4 Safe and secure routes to schools shall be designated for each school and any new residential project shall identify the safe path to school for children.

Working with the school district, citizens, and developers, the City will need to undertake a process of defining school routes.

Policy 5 Access management standards shall be developed in conjunction with the functional classification system for Forest Grove to improve safety in Forest Grove.

Access control standards shall be developed for each street classification. These standards shall be applied to all new road construction and new development. For roadway reconstruction, existing driveways shall be compared with the standards and a reasonable attempt shall be made to comply (possibly consolidating driveways as an example).

Policy 6 Establish a City monitoring system that regularly evaluates, prioritizes and mitigates high accident locations within the City.

Review traffic accident information regularly to systematically identify, prioritize and remedy safety problems. Working with the County, develop a list of projects necessary to eliminate such problems. Require development applications to identify mitigation for high collision locations if they generate 10% increase to existing traffic at an intersection.

Policy 7 Improve traffic safety through a comprehensive program of engineering, education and enforcement.

Policy 8 New roadways shall meet IES Lighting Standards. Existing roadways shall be systematically retrofitted with roadway lighting.

Priority locations for roadway lighting include schools, parks and town center. The City shall coordinate with the County lighting district.

Goal 4—Performance Measures

Transportation performance measures shall be set and maintained by the City.

Policy 1 A minimum intersection level of service standard shall be set for the City of Forest Grove. All public facilities under the city's jurisdiction shall be designed to meet this standard.

Level of service D, Highway Capacity Manual, Chapters 9, 10 and 11 (or subsequent updated references) is recommended to balance provision of roadway capacity with level of service and funding. Monitor Metro and Washington County's current work to develop a level of service standard.

Policy 2 Parking minimum and maximum ratios shall be set to provide adequate parking, while providing an incentive to limit the use of the single occupant vehicle.

Parking standards shall be listed in the development code for the City of Forest Grove. DEQ encourages lower parking ratios to encourage use of alternative modes (walking, biking, transit, car pooling, etc.).

Policy 3 Work with Washington County, Metro and ODOT to develop, operate and maintain intelligent transportation systems, including coordination of traffic signals.

Policy 4 Provide a cost-effective transportation system where the public, land use development and users pay their respective share of the system's costs proportional to their respective demands placed upon the multi-modal system.

Goal 5—Accessibility

Develop transportation facilities which are accessible to all members of the community and minimize out of direction travel.

Policy 1 Design and construct transportation facilities to meet the requirements of the Americans with Disabilities Act.

Policy 2 Develop neighborhood and local connections to provide adequate circulation in and out of the neighborhoods.

Work toward the eventual connection of streets identified on the plan as funds are available and opportunities arise. As a planning guideline, require local streets to have connections no more than 530 feet for local and neighborhood streets, except where prevented by topography, barriers such as railroads, freeways or pre-existing development, or environmental constraints..

Policy 3 Work with Washington County to develop an efficient arterial grid system that provides access within the City, and serves through City traffic.

As outlined in Title 6 of the Metro Urban Growth Management Functional Plan, access connection standards will be developed. The arterial street system should facilitate street, bicycle and pedestrian connectivity.

Goal 6—Goods Movement

Provide for efficient movement of goods and services.

Policy 1 Design arterial routes, highway access and adjacent land uses in ways that facilitate the efficient movement of goods and services.

Policy 2 Require safe routing of hazardous materials consistent with federal and state guidelines.

Work with federal agencies, the Public Utility Commission, the Oregon Department of Energy and ODOT to assure consistent laws and regulations for the transport of hazardous materials.

Goal 7—Coordination

Implement the Transportation System Plan (TSP) in a coordinated manner.

Policy 1 Coordinate and cooperate with adjacent agencies (including Washington County, Cornelius, Metro and ODOT) when necessary to develop transportation projects which benefit the region as a whole in addition to the City of Forest Grove.

Maintain plan and policy conformance to the Regional Transportation Plan and Transportation Planning Rule (OAR 660-012). Seek compatibility with all adjacent county and city jurisdiction plans.

Other Plans

The relationship of the TSP to other regional planning documents can be puzzle of acronyms, activities and plans. Figure 2-2 summarizes the transportation planning puzzle, identifying where the Forest Grove TSP fits within the on-going regional context of planning. Many of the most common planning initiatives and terms are reduced to acronyms, which are summarized below:

ECO - Employee Commute Options. An urban area TDM program required by Department of Environmental Quality (DEQ) of employers of 50 or more persons to reduce vehicle trips.

ITS - Intelligent Transportation Systems. Use of advancing technology to improve movement of people and goods safely.

LRT - Light Rail Transit. Planned by Metro, designed and operated by Tri-Met, providing a high capacity transit option linking key centers in the region.

OTP - Oregon Transportation Plan, a federally mandated plan developed by Oregon Department of Transportation (ODOT) to guide statewide transportation development.

RTP - Regional Transportation Plan, developed by metropolitan planning organizations (MPO) to guide regional transportation investment, required to secure federal funding. In Portland this task is performed by Metro (Metropolitan Service District).

TDM - Transportation Demand Management. An element of the TSP, that includes a series of actions to reduce transportation demand during peak periods.

TPR - Transportation Planning Rule, Statewide Planning Goal 12 developed by Department of Land Conservation and Development (DLCD) to guide transportation planning in Oregon.

TSP - Transportation System Plan, a requirement of the TPR for cities and counties in Oregon to guide local transportation decisions and investments.

Access Management - Methods to address improved safety and performance of state highways through control of access commensurate with facility needs.

Corridor Plan - ODOT transportation plans which focus on state transportation corridors to specifically outline needs, modes, strategies and effective investment.

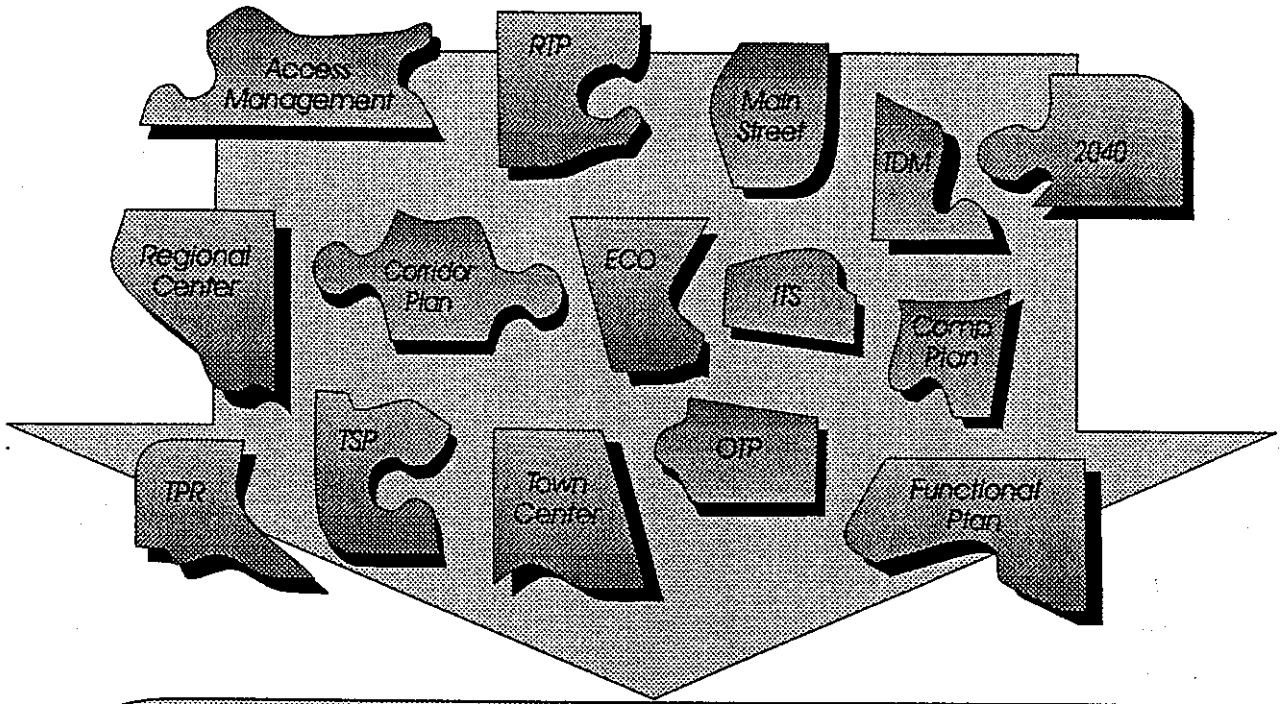
Urban Growth Management Functional Plan – A regional functional plan adopted by Metro in November 1996 with requirements binding on cities and counties in the Metro region. The requirements address accommodation of projected regional population and job growth, regional parking management, water quality conservation, retail in employment and industrial areas and accessibility on the regional transportation system.

2040 Growth Concept – A long range vision directed by Metro in 1995 to direct growth to center and along major transportation corridors throughout the region during the next 50 years. It relies on a balanced transportation system that accommodates walking, bicycling, driving, using transit and national and international goods movement. It defines several 2040 design types throughout the region to which Urban Growth Management Functional Plan requirements apply.

- **Regional Center:** Compact centers of employment and housing served by high quality transit. They will become the focus of transit and highway improvements.
- **Town Center:** Provides for localized services within a 2-3 mile radius, with a community identity.
- **Station Areas:** Development centered on LRT or high capacity transit, accessible by all modes.
- **Main Street:** Similar to town centers, an area with a traditional commercial identity, but smaller in scale, along a street with good transit services.
- **Corridors:** Development along a primary and frequent transit corridor that encourages mixed use and pedestrian access to transit.

City of Forest Grove Transportation Puzzle

Transportation System Plan forest grove



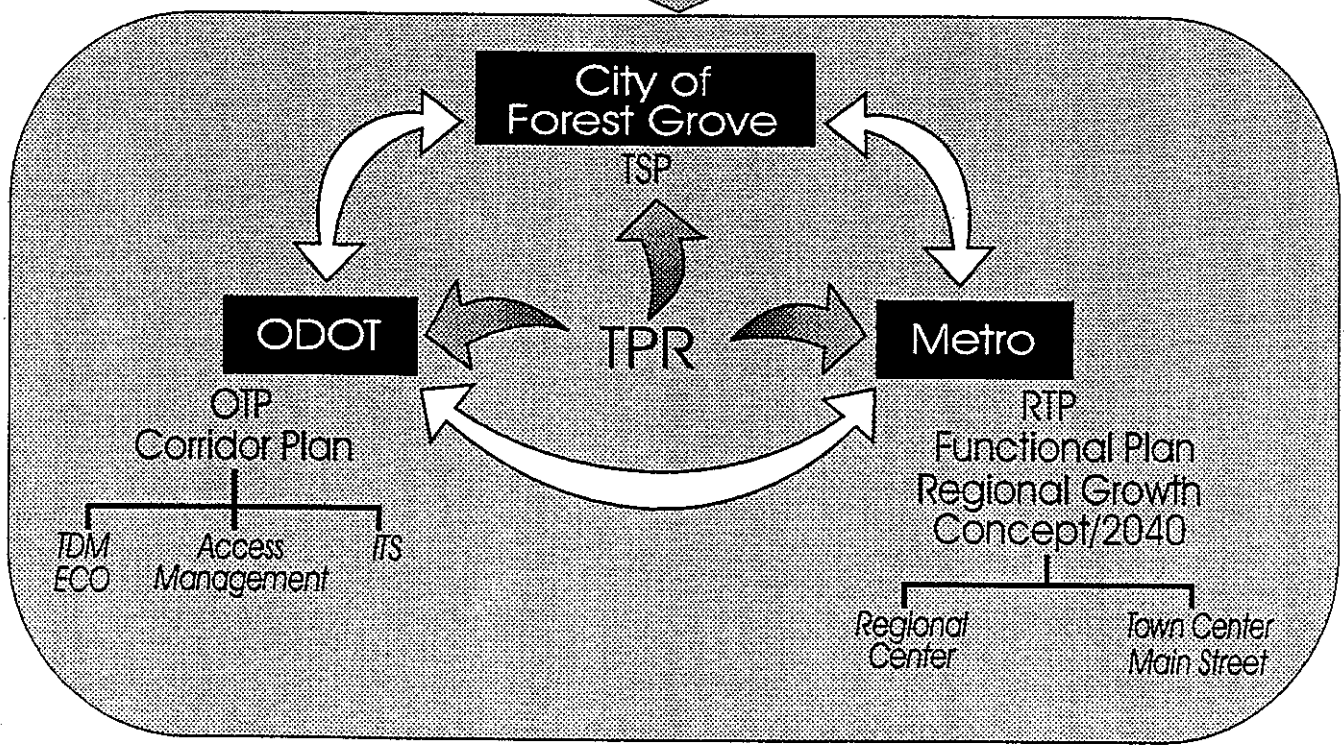


Figure 2-2
RELATIONSHIP OF TSP TO REGIONAL PLANNING

DKS Associates

Chapter 3: Existing Conditions

This chapter summarizes existing traffic and transportation conditions in the City of Forest Grove. It considers vehicle traffic, as well as transit, pedestrian and bicycle modes. To understand existing travel patterns and conditions, a variety of aspects of the city's transportation system were considered. In the fall of 1999, an inventory of traffic conditions in Forest Grove was undertaken to establish a base year for all subsequent analysis. Much of this data provides a benchmark (basis of comparison) for future assessment of transportation performance in Forest Grove relative to desired policies.

The following sections briefly describe existing roadway functions, circulation, traffic speeds and volumes and levels of service in the Forest Grove transportation system.

Previous Work

There have been several previous studies in recent years which have related to transportation issues in Forest Grove. These studies provide background into transportation needs and opportunities in the area, and have been important resources for conduct of the current study. An annotated bibliography of a few key studies is provided below:

***Transportation Planning Rule,* Oregon Administrative Rules (OAR) 660-12.** The adoption of the Transportation Planning Rule (TPR) in May 1991, (updated in April 1995) mandates comprehensive transportation planning for cities in Oregon. The TPR defines the specific requirements for a transportation system plan. The areas of analysis addressed in the TPR for a transportation system plan include the following:

1. Roadway capacity and level of service
2. Transit capacity and capacity utilization
3. Bicycle and pedestrian system capacity
4. Adjustment of turning movement volumes produced by travel demand forecasting models
5. Estimation of future transportation needs (person travel), reflecting:
    - population and employment forecasts consistent with comprehensive plans
    - effects of measures to reduce reliance on the automobile
    - increased residential, commercial and retail development densities
    - location of neighborhood shopping centers near residential areas

- better balance between jobs and housing within subareas
- maximum parking limits for office and institutional developments
- appropriate levels of transportation facilities to serve land uses identified in transportation plans
- increases in average automobile occupancy
- increases in modal shares of non-automobile modes
- effects of TDM programs and rearranged land uses on the number and length of automobile trips per capita
- effects of land use and subdivision regulations to increase non-auto trip making

6. Estimation of future goods movement needs
7. Access management

***Oregon Highway Plan*, Oregon Department of Transportation, March, 1999.** The Oregon Highway Plan (OHP) is a specific element of the Oregon Transportation Plan. The OHP identifies relationships with other plans, identifies needs, policies to address the needs, strategies to address the needs and alternatives at three different funding levels. Alternate methods of meeting or altering needs and financing options are also discussed.

***Oregon Transportation Plan*, Oregon, 1992.** The Oregon Transportation Plan (OTP) sets the general direction for transportation development statewide for the next twenty years. The purpose of the plan is to guide development of a safe, convenient and efficient transportation system that promotes economic prosperity and livability. The OTP contains two elements: Policy and Systems. The OTP provides overall direction for allocating resources and coordinating modes of transportation. It also reviews the relationship of transportation to land use, economic development, the environment, and energy use. Key aspects of the OTP focus on a transportation system that is balanced, efficient, accessible, environmentally responsible, has connectivity among places and modes and carriers, is safe and financially stable.

Oregon Bicycle and Pedestrian Plan, Oregon Department of Transportation, June, 1995. This plan serves the following purposes:

- To implement the actions recommended by the Oregon Transportation Plan
- To guide ODOT, the cities and counties of Oregon and other agencies in developing bikeway and walkway systems
- To explain the laws pertaining to the establishment of bikeways and walkways
- To provide information to citizens interested in bicycle and pedestrian transportation
- To fulfill the requirements of the Intermodal Surface Transportation Efficiency Act (ISTEA), whereby each state must adopt a statewide bicycle and pedestrian plan
- To fulfill the requirements of the Oregon Administrative Rule 660-12 (Transportation Planning Rule 12), and
- To provide standards for planning, designing and maintaining bikeways and walkways

The document includes two sections, including the Policy & Action Plan and Bikeway & Walkway Planning, Design, Maintenance & Safety. The first section contains background

information, legal mandates and current conditions, goals, actions and implementation strategies ODOT proposes to improve bicycle and pedestrian transportation. The second section will assist ODOT, cities and counties in designing, constructing and maintaining pedestrian and bicycle facilities. Design standards are recommended and information on safety is provided.

***Oregon Rail Freight Plan*, Oregon Department of Transportation, August 17, 1994.** The Oregon Rail Freight Plan is an element of the Oregon Transportation Plan (OTP) and includes a description of the Oregon Rail System, Rail Policies and the Planning Process, Light Density Line Analysis and Financing the Rail Program.

***Statewide Transportation Improvement Program 1998-2001*, Oregon Department of Transportation, January 1996.** This document, referred to as the STIP, is a program schedule for the Oregon Department of Transportation. The purpose of the STIP is to schedule funding for Oregon's highest priority transportation projects for the next two years. The reconstruction of Halsey Street to include bike and pedestrian facilities was the only project listed in the STIP relevant to Fairview.

***Region 2040*, Concepts for Growth, Metro, June, 1994.** This report documents Metro's Region 2040 program, which attempts to gauge what could happen 50 years from when the study was initiated. The report outlines three growth concepts, outlines the advantages and disadvantages of each concept, describes a preferred alternative and outlines the building blocks needed to construct a preferred alternative.

***Regional Transportation Policy*, Metro, July 25, 1996.** These are the updated *Regional Transportation Plan* policies which are driven by requirements contained in the state Transportation Planning Rule (TPR) and the need to support the Region 2040 Growth Concept with a multi-modal, balanced transportation system. This document provides the policy context and framework for transportation system planning required under the state TPR for cities and counties. The overall goal of the RTP is to develop a safe, efficient and cost-effective transportation system that serves the region's current and future travel needs and implement the 2040 Growth Concept while recognizing the financial constraints and environmental impacts associated with that system. The guiding principals of the plan include public involvement, accessibility and mobility, system cost, timing and prioritization of system improvements and environmental, economical and social impacts.

***Interim Federal Regional Transportation Plan*, Metro, April, 1995.** The purpose of the federal regional transportation plan (RTP) is to develop a transportation system that provides adequate levels of accessibility to a growing region at the same time recognizing the financial constraints and environmental impacts associated with that system. This document is intended to meet the requirement of the federal Intermodal Transportation Efficiency Act (ISTEA) of 1991, the Clean Air Act Amendments (CAAA) of 1990, and the Americans with Disabilities Act (ADA) of 1991. This report includes a roadway functional classification map, freight network map, primary transit network map, proposed regional bicycle network map and a proposed national highway system map. The RTP recommends transportation improvements through the year 2015.

Draft 2020 Regional Transportation Plan The recommended transportation improvements in the RTP Project List Round 3, July 27, 1999 for Forest Grove include the following:

- Forest Grove Northern Arterial from Quince Street to Highway 47 - Construct new 2-lane arterial with sidewalks and bike lanes
- David Hill Road Connector – Construct two-lane facility with sidewalks and bike lanes from Thatcher Road to Sunset Drive.

- North Forest Grove Connector – Identify north arterial street connection from ORE 47 to Gales Creek Road north of Willamina Avenue.
- Forest Grove Connectivity Improvements – Two-lane parallel facilities to TV Highway between Yew to Holladay, 23rd to 24th Avenue, Main Street and Bonnie Lane and Heather Street.
- Forest Grove to US 26 Improvements – Realign with widened paved shoulders Martin Road and Cornelius-Schefflin Road along the northern UGB to Roy Road.
- Verboort Road at Highway 47 – Intersection safety improvement.
- Gales Creek Road at Thatcher Road – Re-align intersection to increase capacity and safety.
- TV Highway Frequent Bus – Provide improvements that enhance frequent bus service from Forest Grove to Hillsdale via TV Highway and Beaverton-Hillsdale Highway.
- Sunset Drive from University Avenue to Beal Road – Widen to three lanes with bike lanes, sidewalks and signals.
- Pacific Avenue/19th Avenue from Hawthorne Street to E Street – Retrofit to include bike lanes.
- Highway 8 from Quince Street to B Street – Complete boulevard design improvements.
- TV Highway, Pacific Avenue, 19th Avenue, Sunset Drive, College Way and B Street – Improve sidewalks, lighting, crossings, bus shelters and benches.

***Urban Growth Management Functional Plan*, Metro, Adopted November 21, 1996.** A regional functional plan adopted by Metro in November 1996 with requirements binding on cities and counties in the Metro region. The requirements address accommodation of projected regional population and job growth, regional parking management, water quality conservation, retail in employment and industrial areas and accessibility on the regional transportation system. The plan is comprised of 10 Titles, as follows:

- Requirements for Housing and Employment Accommodation
- Regional Parking Policy
- Water Quality and Flood Management Conservation
- Retail Employment and Industrial Areas
- Neighbor Cities and Rural Reserves
- Regional Accessibility
- Affordable Housing
- Compliance Procedures
- Performance Measures
- Definitions

Key aspects of the functional plan which relate to transportation issues include Title 2: Regional Parking Policy and Title 6: Regional Accessibility. The intent of Title 2 is to ensure efficient use of land and reductions in auto trips by monitoring and limiting the amount of parking that is provided. The intent of Title 6 is to maintain adequate accessibility through the region by all modes of transportation, and support use of alternative modes of transportation to avoid unacceptable levels of congestion.

***Forest Grove Bike and Pedestrian Network Plan*, Browning, Shono Architects, June 1995.** The purpose of this study was to update the 1987 bicycle and pedestrian plans and to provide a more balanced analysis of all non-auto modes. The recommended improvements included a finer grain network of off-street paths, sidewalks and bike facilities with a total cost of $3.5 million. These recommendations were used as the starting point for the bicycle and pedestrian plan elements to be incorporated into the updated Transportation System Plan.

***Town Center Plan*, City of Forest Grove, 1997.** This study developed the necessary policy framework, land use zoning and general design guidelines to cultivate a town center area. The transportation recommendations included de-coupling the Pacific Avenue and 19th Avenue one-way couplet through the downtown area, and providing better east-west street connections between Main Street and Sunset Drive.

***Washington County MSTIP Capital Improvement Program*, Washington County.** The Major Street Transportation Improvement Program (MSTIP) evaluates, ranks and schedules transportation capital projects needs in Washington County based on voter approved list of projects. Three separate MSTIP measures have been approved by voters, and the following projects are part of the third MSTIP. The projects identified in the program for the City of Forest Grove include the following:

- *Sunset Drive* – Between University Avenue and Beal Road, widen to collector standard three lanes road cross-section (left-turn pockets at major intersections). Total funding is $5.8 million. Project includes upgrading traffic controls at Willamina Avenue. The project is expected to be constructed y 2005.
- *Verboort Road* – Although this is outside of the city limits, the planned improvements on Verboort Road at the intersections with Martin Road and Cornelius-Schefflin Road will enhance the capacity and safety for travel to and from US 26. The project is still in the planning phase, but $14.0 million has been allocated for the overall effort that is expected to be built by 2004.

***Washington County Transportation Plan*, Washington County, October 1988.** The county transportation plan provides a framework for regional roadways outside of the city limits and reflects the functional class designations for collector and arterial facilities within the city.

Functional Classification

Roadways have two functions, to provide mobility and to provide access. From a design perspective, these functions can be incompatible since high or continuous speeds are desirable for mobility, while low speeds are more desirable for land access. Arterial facilities emphasize a high level of mobility for through movement; local facilities emphasize the land access function; and collectors offer a balance of both functions.

The existing functional classification of streets in Forest Grove is represented by Figure 3-1. Any street not designated as either an arterial or collector is considered a local street. Forest Grove's

functional classification system was reviewed as part of this project and the proposed functional classification system is discussed in the Motor Vehicle chapter (Chapter 8).

Washington County roadway classifications are consistent with City of Forest Grove designations. Metro only classifies roads that are considered to be of regional significance. These classifications are compatible with Forest Grove classifications, although the specific classification names may differ. Washington County and Metro classifications can be found in Tables 3-1 and 3-2 and the *Roadway Functional Classification According to Jurisdiction* table in the appendix of this report. Metro classifications are from the 1997 Interim Federal RTP.

Existing Circulation

The following selected key routes within Forest Grove are summarized below to provide a description in terms of functional classification, connectivity, and roadway volumes. Tables 3-1 and 3-2 summarize the complete arterial and collector street network in Forest Grove.

Arterial Streets

Highway 47 is the first leg of the bypass around the central portion of the city. The old Highway 47 route was along B Street to 19th Avenue (Pacific Avenue in the opposite direction) to Council Street to College Way to University Avenue to Sunset Drive. The old route bisected the heart of the city's downtown area, and significantly effected both traffic operations and the local ambience because of the related high truck traffic volumes. The second leg of the Highway 47 bypass (connecting from Quince Street to Beal Road) began construction this next year and with completion expected by 2002. The southern bypass leg is classified by Forest Grove as an Arterial, by Washington County as a Principal Route, and by Metro as a Minor Arterial. It is designated by ODOT as a Regional Level of Importance. It provides access to arterial and collector streets along the south side of Forest Grove, and it connects TV Highway regional traffic to destinations south of the city. Highway 47 is a two-lane roadway with no bike lanes or sidewalks along its frontage. However, a multi-use path follows along the north (west) side of the roadway. The posted speed is 55 miles per hour. It carries approximately 10,400 vehicles daily east of Old Highway 47 (B Street), with about 1,000 vehicles (two-way) during the evening peak hour.

TV Highway is the primary east-west regional facility serving the city. The Tualatin-Valley Highway begins at the Maple Street intersection then proceeds easterly for approximately 25 miles through Cornelius, Hillsboro, Beaverton, and Multnomah County. TV Highway (ORE 8) is classified by Metro and Washington County as a Principal Arterial or Route. ODOT has designated is as a regional level of importance. It is a four-lane, two-way street with bike lanes and sidewalks along most of its frontage. It has a posted speed of 45 miles per hour. It carries approximately 32,400 vehicles daily east of Quince Street, with about 3,200 vehicles (two-way) during the evening peak hour.

Pacific Avenue is the westbound half of the downtown one-way couplet. It is classified by Metro as a Minor Arterial and Washington County as a Principal Route. This is one of two central east-west facilities in the city and it provides access to the north-south arterial and collector streets within Forest Grove. It is a two-lane, one-way street with sidewalks along its frontage. The one-way designation extends from Maple Street on the east side to B Street on the west side. It has a posted speed of 30 miles per hour. Traffic signals east of Cedar Street are coordinated to service traffic flows at this speed. Pacific Avenue carries approximately 10,000

vehicles daily near Elm Street, then lowers to 7,300 near B Street. This route is referred as ORE 8 by ODOT which currently maintains this facility up to the old Highway 47 route at B Street. Once the northern Highway 47 bypass leg is constructed (see above), maintenance and operation of this portion between Maple Street and B Street along the couplet will revert to the city.

19th Avenue is the eastbound half of the downtown one-way couplet. It is classified by Metro as a Minor Arterial and Washington County as a Principal Route. This is one of two central east-west facilities in the city and it provides access to the north-south arterial and collector streets within Forest Grove. It is a two-lane, one-way street with sidewalks along its frontage. The one-way designation extends from B Street on the west side to Maple Street on the east side. It has a posted speed of 30 miles per hour. It carries approximately 10,000 vehicles daily near Elm Street, then lowers to 6,700 near B Street. This route is referred as ORE 8 by ODOT, and they maintain this facility up to the old Highway 47 route at B Street. Once the northern Highway 47 Bypass leg is constructed (see above), maintenance and operation of this portion between Maple Street and B Street along the couplet will revert to the city.

B Street is an arterial facility between Pacific Avenue (ORE 8) and the southern city limits. Washington County designated this segment as a Principal Route. North of Pacific Avenue, B Street changes to a collector facility until its northern terminus (currently at Hartfield, north of the high school). The arterial portion is a two-lane, two-way roadway with a posted speed ranging from 25 to 35 miles per hour. It has sidewalks along most of the fronting uses, although there are significant gaps (see Pedestrian section of this chapter). There are no bike lanes. It carries 5,700 vehicles daily at the city limit, with about 500 to 600 vehicles (two-way) during the evening peak hour.

Sunset Drive connects University Avenue to Beal Road near the north city limits, then continues north past the intersection of Verboort Road in unincorporated Washington County. The segment within the city is currently designated as Highway 47, but this will be changed once the northern bypass is completed (2002). Washington County designated Sunset Drive as a Principal Route denoting its current usage. It is a two-lane, two-way street with no bike lanes and limited sidewalks along its frontage. The segment near Willamina Avenue has open drainage ditches and no improved shoulders (this segment is outside of the city limits). It has a posted speed of 35 miles per hour. Sunset Drive carries approximately 7,100 vehicles daily north of 26th Avenue, with about 700 vehicles (two-way) during the evening peak hour.

E Street connects Pacific Avenue to Gales Creek Road, and it is the north-south arterial in western side of the city. It is classified by Metro and Washington as a Minor and Major Arterial, respectively. It is a two-lane, two-way street with bike lanes and sidewalks along its frontage. The sidewalk is offset from the roadway along the western side of E Street fronting the Tom McCall middle school. It has a posted speed of 40 miles per hour. It carries approximately 900 vehicles (two-way) during the evening peak hour.

Gales Creek Road connects to E Street near Gales Way, then continues westerly to the city limit. It is classified by Metro and Washington as a Minor and Major Arterial, respectively. It is a two-lane, two-way street with bike lanes and partial sidewalks along its frontage. Sidewalk improvements generally end west of Thatcher Road. Gales Creek Road has a posted speed of 40 miles per hour. It carries approximately 700 vehicles (two-way) during the evening peak hour.

Thatcher Road connects Gales Creek Road to Purdin Road (a Washington County facility) and serves the growing northwest sector of the city. Washington County classifies it as a Major Collector and Metro does not consider it a regionally significant facility. It is a narrow two-lane, two-way street with no bike lanes or sidewalks along any of its frontage. It has a posted speed of

40 miles per hour with speed restrictions at substandard curves. It carries approximately 300 vehicles (two-way) during the evening peak hour.

College Way connects Pacific Avenue to University Avenue, and it the serves as one element of the existing Highway 47 route through downtown. It borders the western side of the Pacific University campus, and has a high degree of pedestrian traffic (see Pedestrian section in this chapter). The College Way intersection with Pacific Avenue is offset about 15 feet from the opposing Council Street leg to the south. This facility is a Principal Route according to Washington County. It is a two-lane, two-way street with sidewalks and no bike lane along its frontage. On-street parking is allowed along the entire length. It has a posted speed of 25 miles per hour. It carries approximately 230 vehicles (two-way) during the evening peak hour.

University Avenue connects Main Street Cedar Street. However, the portion designated as an arterial is limited to College Way to Sunset Drive. This is another element of the existing Highway 47 route through downtown. Washington County designated this as a Prinicipal Route, as with all the other elements of the northerly Highway 47 route. University Avenue borders the north side of the Pacific University campus. It is a two-lane, two-way street with sidewalks and no bike lanes along its frontage. It has a posted speed of 25 miles per hour. It carries roughly 500 vehicles (two-way) during the evening peak hour.

Quince Street connects TV Highway to Martin Road which continues to the northeast up to Verboort Road. This is one of three northern gateways from the city Verboort Road and destinations further north, namely US 26. Quince Street will be an integral part of the northern Highway 47 bypass to be constructed by 2002. Metro and Washington County classifies it as a Principal Route and Arterial, respectively. It is a two-lane, two-way street with sidewalks and no bike lanes along its frontage. It has a posted speed of 25 miles per hour, and it carries 230 vehicles (two-way) during the evening peak hour.

Collector Streets

The designated collector streets in the city are summarized in Table 3-2. None of these facilities are noted in the Metro Regional Road Map plans since they serve only local uses. Washington County designates all of these streets as collector facilities. The discussion below highlights several of the more important collector facilities. All collector streets have 25 miles per hour posted speed limits.

23rd Avenue connects E Street to Main Street, and it connects Sunset Drive to Hawthorne Street. The western segment primarily serves residential uses while that other half serves light industrial areas. West of E Street opposite 23rd Avenue is Goff Road. This roadway will be extended westerly to connect to Willamina Avenue which already connects to Gales Creek Road at the western edge of the city. 23rd Avenue is a two-lane, two-way roadway with fronting sidewalks although there are gaps where property has been developed. There are no bike facilities. It carries up to 200 vehicles during the p.m. peak hour.

Beal Road is a short two-lane, two-way roadway that connects Main Street to Sunset Drive. It has sidewalks and no bike lanes, and it is posted at 25 miles per hour. The connection to Sunset Drive will be terminated concurrent with the construction of the northern Highway 47 Bypass. This facility will no longer function as a collector at that time.

Elm Street is one of two north-south collector roads that connect the southern Highway 47 Bypass through the south half of the city to Pacific Avenue and 19th Avenue. The other north-

south collector is Maple Street. Elm Street is a two-lane, two-way roadway with sidewalks and no bike lanes. It carries about 250 vehicles (two-way) during the evening peak hour.

Hawthorne Street parallels Elm Street to the east but it does not connect directly to the Southern Highway 47 Bypass. It extends north of Pacific Avenue to its terminus at 26th Avenue. The current functional plans shows that it is to be extended north to the Northern Highway 47 Bypass. It is a two-lane, two-way roadway with limited sidewalks.

Main Street connects 19th Avenue through the downtown commercial and college facility area then continues north from about 23rd Avenue along fronting residential property to Hartfield Road. There is an existing gap in Main Street between Willamina Avenue and Beal Road. Main Street is a two-lane, two-way street with sidewalks on all the built portions, but no bike facilities. On-street parking is allowed along nearly all portions of Main Street. It is posted for 25 miles per hour. It carries 100 to 550 vehicles during the evening peak hour.

Maple Street/Fern Hill Road connects TV Highway to the Southern Highway 47 Bypass then continues south, as Fern Hill Road, past the water treatment plant. Maple Street generally fronts residential uses. Maple Street is a two-lane, two-way roadway with curb, gutter and sidewalk north of Highway 47 Bypass. Fern Hill Road has unimproved shoulders with no pedestrian or bike facilities. Maple Street carries about 2,300 vehicles daily with about 200 to 300 vehicles (two-way) during the evening peak hour.

Watercrest Road connects Forest Gale Drive to Thatcher Road in the northwest sector of the city. It is a two-lane, two-way road with no sidewalks or bike lanes. It carries about 100 vehicle during peak hours.

Willamina Avenue connects Gales Creek Road to Sunset Drive and serves residential uses on both sides of the road. It is a two-lane, two-way 40-foot wide roadway with no sidewalks or bike lanes. Traffic volumes are up to 160 vehicles during the p.m. peak hour, with up to 400 vehicles in the morning peak hour between Sunset Drive and B Street. This higher morning volume is related to high school traffic. In the evening peak hour, school traffic is very small compared to morning hours.

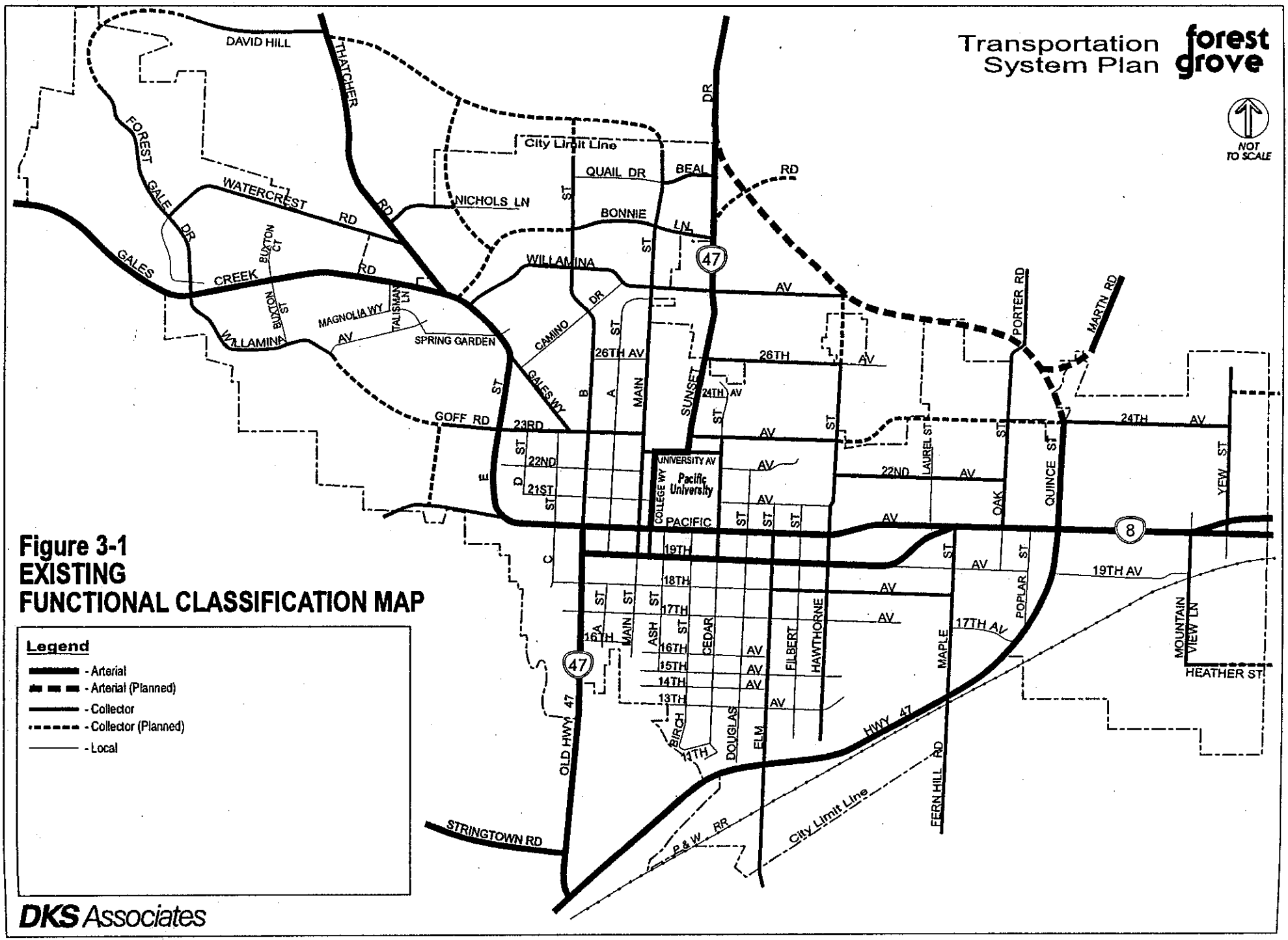


Figure 3-1
EXISTING
FUNCTIONAL CLASSIFICATION MAP

Legend

- Arterial
- Arterial (Planned)
- Collector
- Collector (Planned)
- Local

DKS Associates

Table 3-1: Street Network Summary - Arterials

Street	*Functional Classification*			*Lanes*	*ADT*	*PM Peak**	*Posted Speed*	*Ped/Bike***
	Forest Grove	Washington County	Metro					
19th Avenue	Arterial	Principal Route	Minor Arterial	2	10,000		30	Y/N
B Street (s/o Pacific)	Arterial	Principal Route	NA	2	5,700		35	Y/N
College Way	Arterial	Principal Route	NA	2		230	25	Y/N
E Street	Arterial	Major Arterial	Minor Arterial	2		900	40	Y/Y
Gales Creek Road	Arterial	Major Arterial	Minor Arterial	2		700	40	Y/Y
Highway 47 Bypass	Arterial	Principal Route	Principal Arterial	2	10,400		55	N/N
Pacific Avenue	Arterial	Principal Route	Minor Arterial	2	10,000		30	Y/N
Quince Street	Arterial	Principal Route	Principal Arterial	2/5		230	25	Y/N
Sunset Drive	Arterial	Principal Route	NA	2		700	35	N/N
Thatcher Road	Arterial	Major Collector	NA	2		300	40	N/N
TV Highway (ORE 8)	Arterial	Principal Route	Principal Arterial	4	32,400		40	Y/Y
University Avenue	Arterial	Principal Route	NA	2		500 (est.)	25	Y/N

*PM Peak = Two-way traffic volume during evening peak hour

**Peds/Bikes = Pedestrian facilities/bicycle facilities (Y or N)

ADT = Average Daily Traffic

Table 3-2: Street Network Summary - Collectors

Street	*Functional Classification*			*Lanes*	*PM Peak Hour**	*Posted Speed*	*Ped/Bike***
	Forest Grove	Washington County	Metro				
22nd Avenue	Collector	Collector	NA	2	NA	25	Y/N
23rd Avenue	Collector	Collector	NA	2	210	25	Y/N
24th Avenue	Collector	Collector	NA	2	NA	25	N/N
26th Avenue	Collector	Collector	NA	2	NA	25	Y/N
B Street (north of Pacific)	Collector	Collector	NA	2	210	25	Y/N
Beal Road	Collector	Collector	NA	2	NA	25	Y/N
Elm Street	Collector	NA	NA	2	250	25	Y/N
Forest Gale Drive	Collector	Collector	NA	2	190	25	Y/N
Gales Way	Collector	Collector	NA	2	NA	25	Y/N
Hawthorne Street	Collector	Collector	NA	2	NA	25	N/N
Main Street (north of 19th)	Collector	Collector	NA	2	550	25	Y/N
Maple Street/Fern Hill Road	Collector	Major Collector	NA	2	230	25	Y/N
Mountain View Lane	Collector	Collector	NA	2	NA	25	Y/N
Oak Street (north of Pacific)	Collector	Collector	NA	2	NA	25	Y/N
Porter Road	Collector	Major Collector	NA	2	NA	25	N/N
Ritchey Road (Pacific)	Collector	Minor Collector	NA	2	250	25	N/N
Watercrest Road	Collector	Collector	NA	2	120	25	N/N
Willamina Avenue	Collector	Collector	NA	2	160	25	N/N
Yew Street	Collector	Collector	NA	2	NA	25	N/N

*PM Peak = Two-way traffic volume during evening peak hour

**Peds/Bikes = Pedestrian facilities/bicycle facilities (Y or N)

NA = Data not available or not applicable

Pavement Condition

A visual inspection of the street system of Forest Grove was conducted using a pavement condition rating system. The system has three rating categories: good, fair and poor. These general ratings reflect the severity and amount of pavement distress. Figure 3-2 shows the existing pavement conditions for Forest Grove. Table 3-3 shows the breakdown of mileage in each of the classes of pavement condition. The totals do not include state maintained facilities. A complete breakdown of the roadway facilities is in the appendix.

Table 3-3: Roadway Pavement Conditions Summary

	Surface Conditions	*Distance (miles)*
	Good	9.8
	Fair	3.6
	Poor	0.7
	Total	14.1
Note:	Based on visual survey taken in April 1999 on arterial and collector facilities. Does not include approximately 6.5 miles of state maintained facilities.	

Traffic Speed And Volume

Speed zones on arterials and collectors within the City of Forest Grove are summarized in Figure 3-3. There are two ways a speed zone can be established by statute. One is in a "residence district," which is vaguely defined in the Oregon Vehicle code under 801.430, and the other is a school zone. A residence district can be posted at 25 mph and a school zone can be posted at 20 mph.

In all other cases, an engineering study is required to determine the appropriate speed zone (the basis is the 85th percentile speed). The study is typically done by the appropriate ODOT region office. The speed zone recommendation (based on the engineering study) is then forwarded from the ODOT region office to Salem to be approved by the State Traffic Engineer. If the jurisdiction requesting the speed study does not agree with the results of the engineering study and recommendation to the State Traffic Engineer, the jurisdiction can appeal the decision to the Speed Zone Review Panel (which meets only once a year). For some perspective on the magnitude of what this board does, this panel reviewed only four cases for the entire state of Oregon in 1997.

Vehicle speeds on several collector and residential streets are a concern for the community. In most cases, speeding becomes very noticeable when it is above 30-35 miles per hour. Speeding can usually be expected on local streets where the streets are wide and straight for long stretches or where downhill grades are extended.

Transportation System Plan forest grove

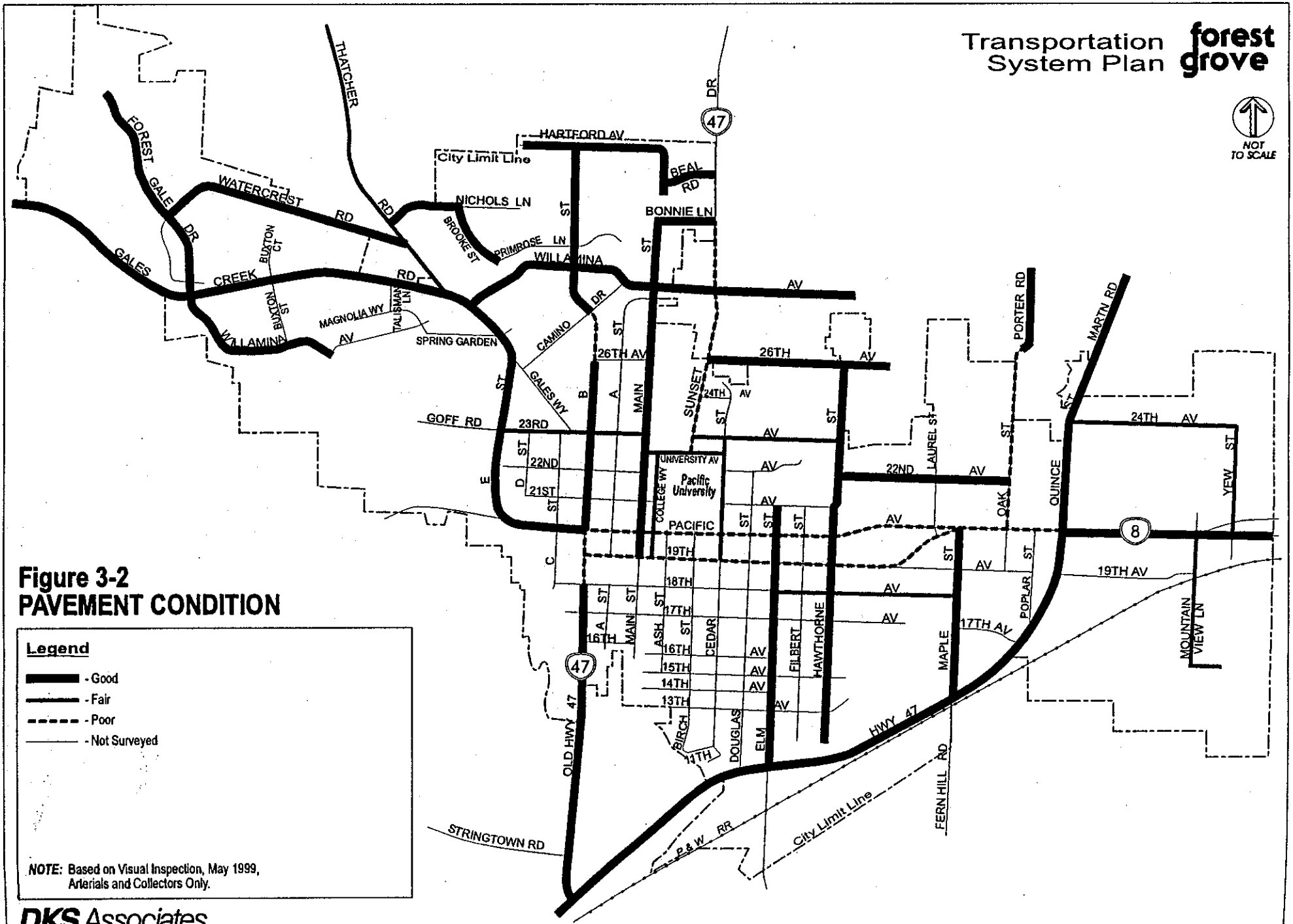


Figure 3-2
PAVEMENT CONDITION

Legend

- Good
- Fair
- Poor
- Not Surveyed

NOTE: Based on Visual Inspection, May 1999, Arterials and Collectors Only.

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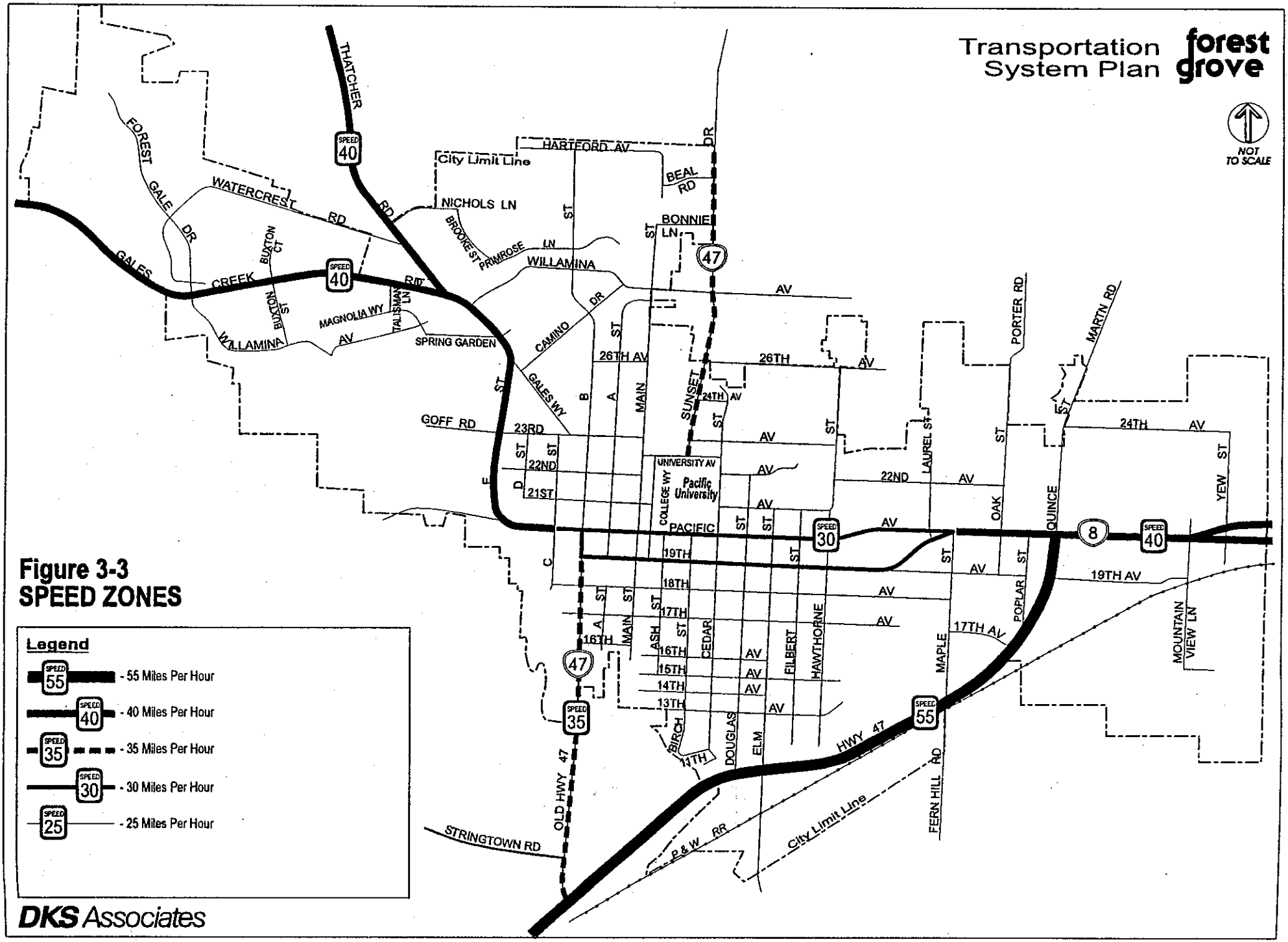

Figure 3-3
SPEED ZONES

Legend

- SPEED 55 - 55 Miles Per Hour
- SPEED 40 - 40 Miles Per Hour
- SPEED 35 - 35 Miles Per Hour
- SPEED 30 - 30 Miles Per Hour
- SPEED 25 - 25 Miles Per Hour

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Traffic Volume

A complete inventory of peak hour traffic conditions was performed in the spring of 1998 as part of the Forest Grove Transportation System Plan. The traffic counts conducted as part of this inventory provide the basis for analyzing existing problem areas as well as establishing a base condition for future monitoring. Existing daily volumes are shown in Figure 3-4. The evening peak period is the time when traffic volume is highest (combination of commute, retail and school activities). Turn movement counts were conducted at 19 intersections during the evening (4-6 PM) peak period to determine intersection operating conditions.

On a typical day, Highway 8 and Highway 47 are the most heavily traveled roadways in Forest Grove. East of Quince Street, Highway 8 carries about 32,400 vehicles per day (two-way). Highway 47 carries about 10,400 vehicles per day (two-way) west of Douglas Street. Overall, based on traffic counts at gateways to the City, about 50,000 vehicles enter and exit Forest Grove (about half in and half out) in a given day.

Traffic Control

Forest Grove has 13 signalized intersections within its city limits. Intersection control is also accommodated through the use of either one-way, two-way, three-way or four-way stop signs. Figure 3-6 shows the traffic control locations in the project study area. Traffic signals are valuable devices for the control of vehicles and pedestrian traffic. Traffic signals, properly located and operated can have one or more of the following advantages:

- They provide for the orderly movement of traffic
- On larger roadways where proper physical layouts and control measures are used, they can increase the traffic handling capacity of the intersection
- They reduce the frequency of certain types of accidents, especially the right angle type
- Under favorable conditions, they can be coordinated to provide continuous or nearly continuous movement of traffic at a definite speed along a given route
- They permit minor street traffic, vehicular or pedestrian, to enter or cross continuous traffic on the major street

Improper or unwarranted signal installation may cause:

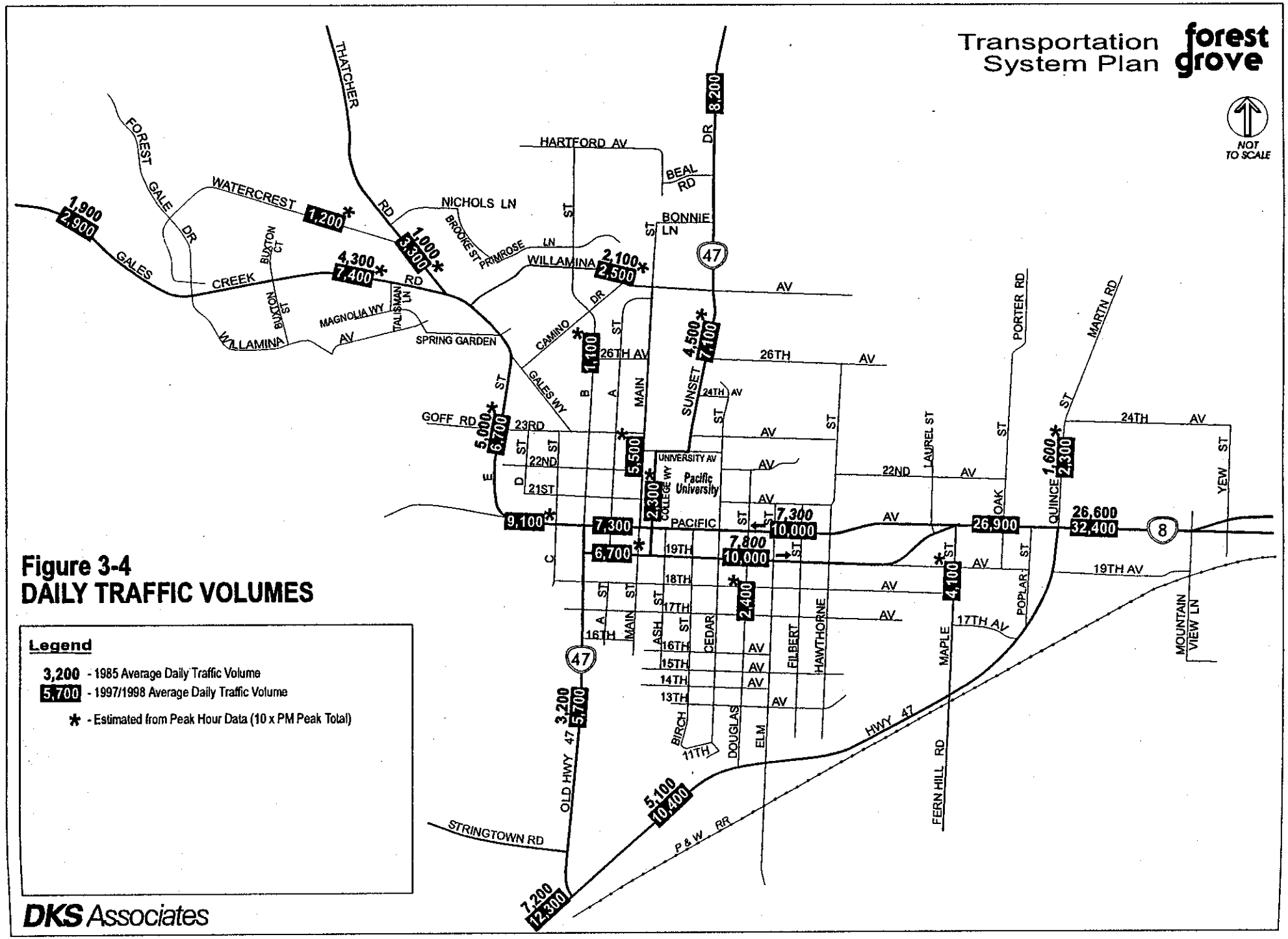
- Excessive delay
- Disregard of signal indication
- Roundabout travel of alternative routes
- Increased fuel use and wear on vehicles, especially trucks
- Increased accident frequency, particularly rear-end type

Consequently, it is important that the consideration of a signal installation and the selections of equipment be preceded by a thorough study based on consistent criteria. These studies identify the need for left turn phasing, lanes and phase types. The justification for the installation of a

traffic signal at an intersection for ODOT, Washington County and Forest Grove is based upon warrants stated in the *Manual on Uniform Traffic Control Devices (MUTCD)*.[1] The MUTCD has been adopted by the state of Oregon and is used throughout the nation.

The same conditions hold true for installation of stop sign traffic control. Specific warrants identify conditions which may warrant a traffic signal or a two-way or multi-way stop sign installation. A stop sign is not a cure-all and is not a substitute for other traffic control devices. Guidelines and warrants for stop sign installations are outlined in the MUTCD.

3 *Manual on Uniform Traffic Control Devices for Streets and Highways*, US Department of Transportation, Federal Highway Administration, 1988, pages 4C1-4C12.


Transportation System Plan
forest grove
NOT TO SCALE
Figure 3-4
DAILY TRAFFIC VOLUMES
Legend
3,200 - 1985 Average Daily Traffic Volume
5,700 - 1997/1998 Average Daily Traffic Volume
* - Estimated from Peak Hour Data (10 x PM Peak Total)
DKS Associates
THATCHER RD
FOREST GALE DR
WATERCREST
NICHOLS LN
BROOKE ST
PRIMROSE LN
BONNIE LN
BEAL RD
HARTFORD AV
GALES CREEK
BUXTON CT
BUXTON ST
MAGNOLIA WY
TALISMAN LN
WILLAMINA AV
SPRING GARDEN
CAMINO DR
GALES WY
GOFF RD
23RD AV
22ND AV
21ST AV
26TH AV
24TH AV
UNIVERSITY AV
COLLEGE WY
Pacific University
PACIFIC AV
19TH AV
18TH AV
17TH AV
16TH AV
15TH AV
14TH AV
13TH AV
11TH
MAIN ST
A ST
B ST
C ST
D ST
E ST
ASH ST
CEDAR ST
FILBERT ST
HAWTHORNE ST
MAPLE ST
LAUREL ST
OAK ST
POPLAR ST
PORTER RD
MARTIN RD
QUINCE ST
YEW ST
SUNSET DR
BIRCH
DOUGLAS
ELM
FERN HILL RD
MOUNTAIN VIEW LN
OLD HWY 47
HWY 47
STRINGTOWN RD
P & W RR
1,900
2,900
1,200*
1,000
3,300*
4,300*
7,400*
2,100*
2,500
8,200
4,500*
7,100
1,100*
5,000*
6,700
5,500*
2,300*
9,100*
7,300
6,700*
7,300
10,000
7,800
10,000
2,400*
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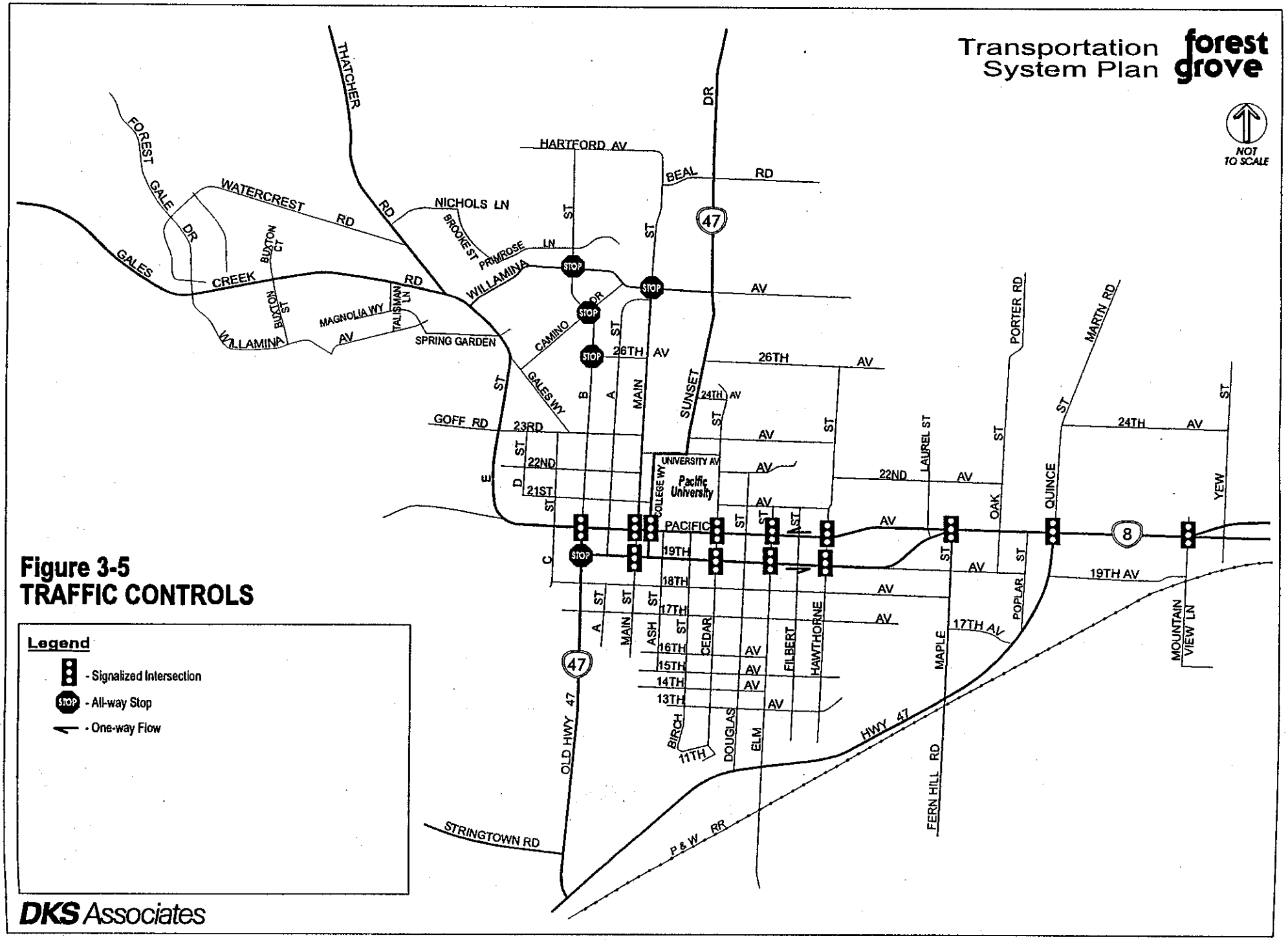
5,100
10,400
7,200
12,300


Transportation System Plan
forest grove
NOT TO SCALE
THATCHER RD
FOREST GALE DR
WATERCREST RD
NICHOLS LN
BROOKE ST
PRIMROSE LN
HARTFORD AV
BEAL RD
47
GALES CREEK RD
BUXTON CT
BUXTON ST
MAGNOLIA WY
TALISMAN LN
WILLAMINA AV
SPRING GARDEN
WILLAMINA
CAMINO DR
GALES WY
26TH AV
24TH AV
GOFF RD
23RD AV
22ND AV
21ST ST
UNIVERSITY AV
COLLEGE WY
Pacific University
PACIFIC
19TH AV
18TH AV
17TH AV
16TH AV
15TH AV
14TH AV
13TH AV
11TH
MAIN ST
A ST
B ST
C ST
D ST
E ST
ASH ST
CEDAR
FILBERT
HAWTHORNE
DOUGLAS
ELM
BIRCH
SUNSET
LAUREL ST
OAK ST
PORTER RD
MAPLE
POPLAR ST
QUINCE ST
MARTIN RD
YEW ST
MOUNTAIN VIEW LN
8
OLD HWY 47
HWY 47
FERN HILL RD
STRINGTOWN RD
P & W RR
STOP
Figure 3-5
TRAFFIC CONTROLS
Legend
- Signalized Intersection
- All-way Stop
- One-way Flow
DKS Associates

Traffic Levels Of Service

While analysis of traffic flows and functional classifications are useful in understanding the general nature of traffic in an area, traffic volumes alone indicate neither the ability of the street network to carry additional traffic, nor the quality of service afforded by the street facilities. For this, the concept of *level of service* (LOS) has been developed to correlate traffic volume data to subjective descriptions of traffic performance at intersections.

Level of service is used as a measure of effectiveness for intersection operation. These categories are similar to report card ratings for intersection traffic performance. Intersections are the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is nearly always diminished in their vicinities. Levels of service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where average vehicle delay exceeds 60 seconds per vehicle entering a signalized intersection and demand has exceeded the capacity. This delay represents jammed conditions and any additional vehicle traffic would require mitigation. This condition is typically evident in long queues and delays. Level of service D has generally been the accepted standard for signalized intersections in urban conditions during peak hour operation, while level of service C or better is accepted for all other times of the day.

Intersections Without Traffic Signals – Intersections controlled by STOP signs on the minor street approaches provide levels of service only for major and minor street turning movements, and not the traffic on the major facility. For this reason, LOS E and even LOS F can occur for a specific side street turning movement, however, the majority of traffic may not be delayed (in cases where major street traffic is not required to stop). LOS E or F conditions at intersections without traffic signals generally provide a basis to study the intersection further and to determine availability of acceptable gaps, safety and traffic signal warrants. The descriptions of level of service for signalized and unsignalized intersections is in the appendix.

Urban Growth Management Issues – The above discussion pertains to typical suburban settings. A recent decision by Metro in support of the goals described in Title 6: Urban Growth Management Functional Plan recommended that a lesser level of service be considered on regional facilities in some cases as an alternative to expanding roadway infrastructure. This regional policy can be incorporated into the framework of a city TSP at the discretion of local decision-makers. For example, rather than sizing new facilities to accommodate LOS D or better on Highway47, the city could opt to tolerate lesser performance levels (LOS E) during short periods of the day. The land and resources that would otherwise be attributed to roadway construction can then be re-directed to other facilities or services that benefit the community.

Intersections Controlled by Traffic Signals

Table 3-4 provides a summary of PM peak hour levels of service at six selected intersections of the 13 intersections controlled by traffic signals. Some queuing generally occurs at the TV Highway/Quince Street and Pacific/Main intersection during peak hours. The city has not adopted a minimum standard for Level of Service. All of these intersection are operating at LOS C or better. In most cases, the p.m. peak hour conditions are slightly more congested than the a.m. peak hour. The capacity analysis calculation sheets are in the appendix.

Table 3-4: Peak Hour Intersection Level of Service – Signal Controlled Locations

Signalized Intersection	*Peak Hour*	*Average Delay Per Vehicle*	*Level of Service*	*Volume to Capacity Ratio*
Pacific Avenue/B Street	AM	10.7	B	0.71
	PM	9.2	B	0.63
Pacific Avenue/Main Street	AM	8.8	B	0.53
	PM	10.5	B	0.73
Pacific Avenue/College-Council	AM	5.8	B	0.35
	PM	5.6	B	0.59
Pacific Avenue/Elm Street	AM	3.5	A	0.33
	PM	4.1	A	0.45
TV Highway/Maple Street	AM	4.9	A	0.50
	PM	6.7	B	0.60
TV Highway/Quince Street	AM	18.1	C	0.83
	PM	16.6	C	0.83

Tables 3-5 summarizes the capacity analysis for evening peak conditions at eleven unsignalized intersections in Forest Grove. These eleven additional intersections, combined with the six signalized intersections mentioned above, represent the 17 key study intersections identified by city staff for analysis in this study. Unsignalized intersections are subject to a separate capacity analysis methodology. Descriptions of level of service for unsignalized and all-way-stop controlled intersections can be found in appendix of this report.

All intersections with STOP sign controls operate at level of service C or better during the evening peak hour. In other words, the minor street approaches have average delays of less than 20 seconds during this hour. The main street approaches that do not have STOP sign controls have little or no delays. None of these intersections have traffic volumes that meet or exceed MUTCD[2] traffic signal warrant 11 (Peak Hour Volume using Figure 4-6 of the MUTCD. At least one MUTCD traffic signal warrant must be met before the installation of a traffic signal is considered.

2 *Manual on Uniform Traffic Control Devices (MUTCD)*, FHWA, 1983.

Table 3-5: Peak Hour Intersection Level of Service – STOP Controlled Locations

Intersection	*Peak Hour*	*Minor Street Average Delay*	*Level of Service**
19th Avenue/Council Street	AM	--	A/A
	PM	--	A/A
23rd Avenue/Main Street	AM	1.4	A/A
	PM	4.3	A/A
B Street/Willamina Avenue *(4-Way STOP)*	AM	20.2	D
	PM	2.8	A
Elm Street/Highway 47	AM	13.5	B/C
	PM	2.3	A/C
Gales Creek Road/Forest Gale Drive	AM	6.9	A/B
	PM	5.8	A/B
Gales Creek Road/Thatcher Road	AM	13.8	A/C
	PM	14.9	A/C
Gales Creek Road/Willamina Avenue	AM	6.2	A/B
	PM	6.0	A/B
Highway 47 Bypass/Maple Street	AM	12.4	A/C
	PM	14.5	A/C
Pacific Avenue/E Street	AM	7.2	A/C
	PM	11.0	A/C
Sunset Drive/Willamina Avenue	AM	10.7	A/C
	PM	10.7	A/C
Thatcher Road/Watercrest Road	AM	7.9	A/B
	PM	4.4	A/A

A/A Level of Serivce for main street approach/minor street approach. Except at B Street and Willamina Avenue which is controlled by an all-way STOP on all approaches. In that case, the delay and LOS represents an average for all movements.

The existing peak hour conditions at the selected study intersections are summarized in Figure 3-6. The locations shown with oval marking are controlled by traffic signals, and the LOS represents the average for all movements. The locations shown with a square are controlled by STOP signs, and the LOS represents the condition for the major/minor street approach, respectively.

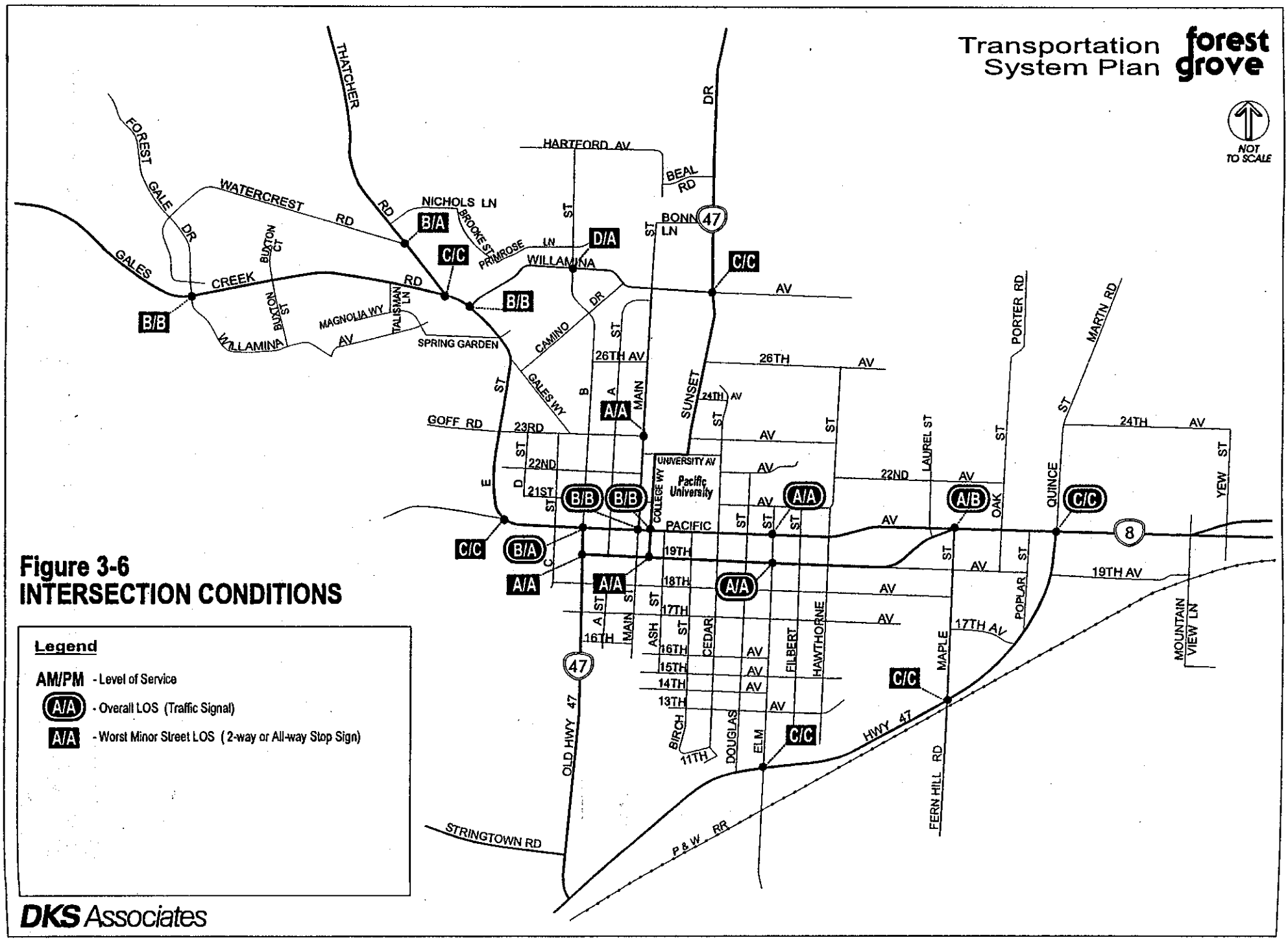

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Figure 3-6
INTERSECTION CONDITIONS
Legend
AM/PM - Level of Service
A/A - Overall LOS (Traffic Signal)
A/A - Worst Minor Street LOS (2-way or All-way Stop Sign)
DKS Associates
THATCHER RD
FOREST GALE DR
WATERCREST RD
NICHOLS LN
BROOKE ST
PRIMROSE LN
BUXTON CT
BUXTON ST
GALES CREEK RD
TALISMAN LN
MAGNOLIA WY
WILLAMINA AV
SPRING GARDEN
CAMINO DR
HARTFORD AV
BEAL RD
BONN LN
WILLAMINA AV
GALES WY
GOFF RD
23RD AV
22ND AV
21ST AV
26TH AV
24TH AV
19TH AV
18TH AV
17TH AV
16TH AV
15TH AV
14TH AV
13TH AV
11TH
PACIFIC AV
UNIVERSITY AV
COLLEGE WY
Pacific University
SUNSET DR
MAIN ST
A ST
B ST
C ST
D ST
E ST
ASH ST
CEDAR ST
FILBERT ST
HAWTHORNE ST
MAPLE ST
POPLAR ST
OAK ST
LAUREL ST
PORTER RD
MARTIN RD
QUINCE ST
YEW ST
MOUNTAIN VIEW LN
BIRCH ST
DOUGLAS ST
ELM ST
OLD HWY 47
HWY 47
FERN HILL RD
STRINGTOWN RD
P & W RR
B/A
C/C
D/A
B/B
A/A
A/B
47
8

Accident History

Accident data was obtained for the City of Forest Grove from Oregon Department of Transportation for the period between January 1, 1994 and December 31, 1997. Figure 3-7 shows accident locations with two or more total reported accidents within 150 feet of an intersection. Locations that have only one reported collision in three years are not statistically significant. Table 3-6 summarizes the highest intersection collision rates.

Table 3-6: Intersection Collision Rates (Within 150 Feet of Intersection)

Rank	*North-South St*	*East-West St*	*Reported Collisions (1994-1997)*	*Collision Rate (Million Entering Vehicles per year)*
1	Hawthorne St	Pacific Ave	29	3.41
2	College-Council	Pacific Ave	20	1.90
3	A St	Pacific Ave	14	1.85
4	B St	23rd Ave	7	1.85
5	Elm St	Pacific Ave	10	1.76
6	Main St	21st Ave	5	1.76
7	Cedar St	Pacific Ave	13	1.72
8	Main St	Pacific Ave	20	1.68
9	B St (Old Hwy 47)	19th St	12	1.40
10	Elm St	Hwy 47	13	1.26
11	B St	Pacific Ave	12	1.00
12	Maple St	Pacific Ave	24	0.97
13	Hwy 47-Quince	Pacific Ave	28	0.86
14	Sunset Dr	26th Ave	5	0.72
15	Sunset Dr	23rd Ave	5	0.71
16	Sunset Dr	University Ave	5	0.71
17	Thatcher Rd	Gales Creek Rd	6	0.64
18	Yew St	TV Highway	16	0.50
19	Maple St	Hwy 47	5	0.47
20	Mountain View Ln	TV Highway	15	0.47
21	Oak St	TV Highway	9	0.33

Typically, intersections on collector and arterial roadways with a collision rate over 1.00 suggest further safety investigation is warranted, as noted by the dashed line in the above table. This threshold does not apply for lower volume streets, less than 2,000 vehicles daily, since the calculated rate can be skewed. As shown in the table, most of the locations within this range are on Pacific Avenue. A review of the Pacific Avenue reported collisions showed a high percentage of collisions related to parking movements. One solution to reduce these conflicts is to restrict parking within a fixed distance from the corner of an intersection, at least 25 feet from the curb return. Another solution in combination with the above could involve curb extensions to better define the parking area versus the travel lane. Other locations (No. 4, 6, 9 and 10) may warrant upgraded traffic control and/or intersection channelization to improve safety. These recommendations are incorporated into the Motor Vehicle section of this report (Chapter 8).

Transportation System Plan

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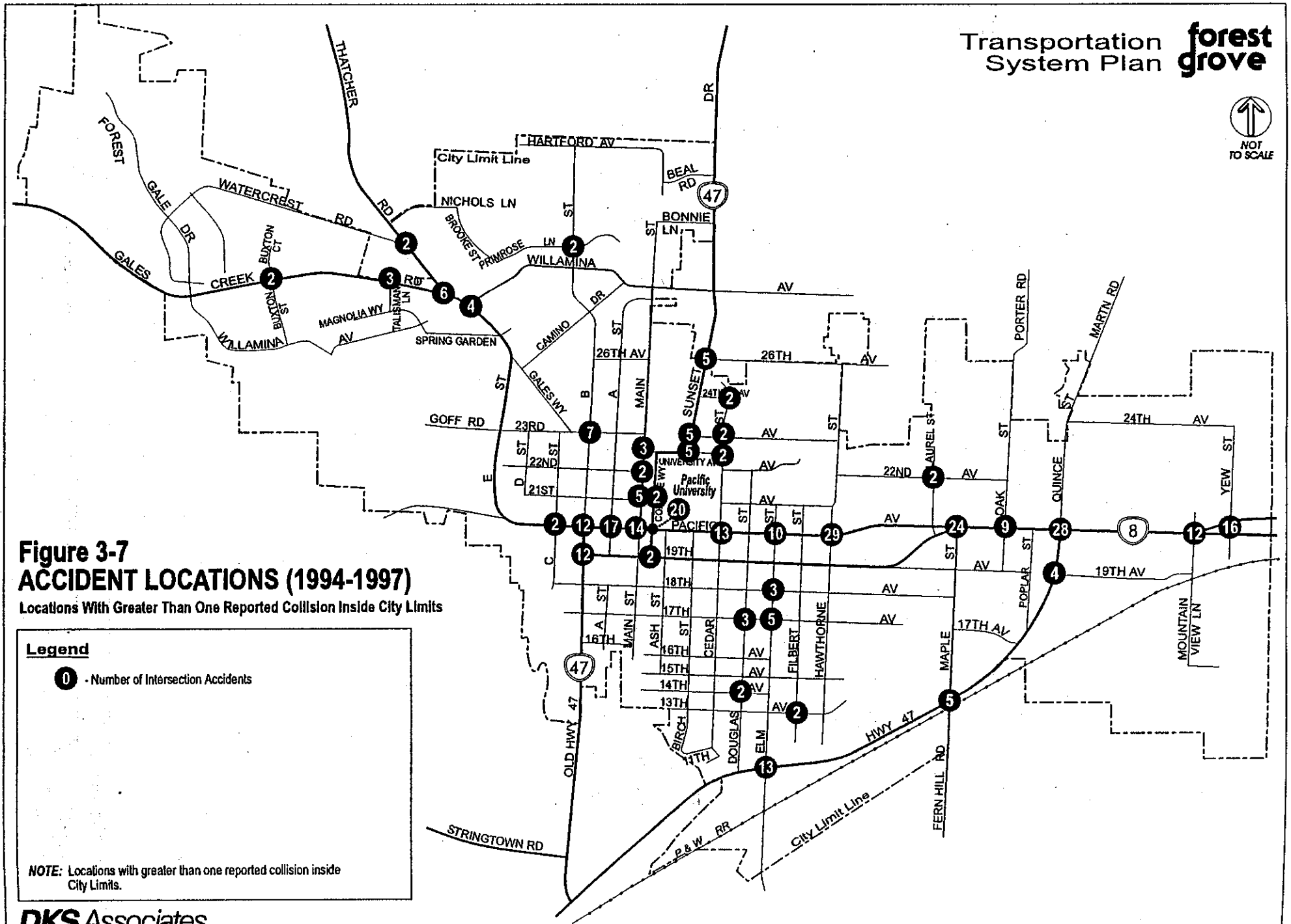

Figure 3-7
ACCIDENT LOCATIONS (1994-1997)

Locations With Greater Than One Reported Collision Inside City Limits

Legend

0 - Number of Intersection Accidents

NOTE: Locations with greater than one reported collision inside City Limits.

DKS Associates

Transit

Transit service is provided to Forest Grove by the Tri-County Metropolitan Transportation District of Oregon (Tri-Met). There is one fixed bus route that directly serves Forest Grove: Route 57 – TV Highway-Forest Grove. Figure 3-8 shows the bus route and bus stops within Forest Grove. Also shown is the typical one-quarter mile walk zone served by the bus line. This zone encompasses the greater downtown area, but it does not serve the residential neighborhoods at the fringes of the city, particularly in the northwest sector. Bus Route 57 provides service between the Beaverton Transit Center and Forest Grove via Canyon Road and Tualatin Valley Highway. The route operates with approximately 30-minute headways in the peak commute periods. Tri-Met reports that on an average weekday, the Route 57 has approximately 750 rider boardings within the city limits. This represents roughly two to three percent of the person-trips that travel along the TV Highway and Pacific/19th Avenue corridor. This is typical for a smaller suburban community such as Forest Grove.

LIFT Program – In addition to the fixed route service, Tri-Met offer a LIFT Program for persons who are unable to use Tri-Met buses or MAX because of a disability. LIFT has served the tri-county area since 1976 with the goal of offering safe and dependable transportation. LIFT policies and procedures are developed within the guidelines of the Americans with Disabilities Act (ADA) rules, and are reviewed by the Committee on Accessible Transportation (CAT), a citizens advisory committee to the Tri-Met Board. Persons are eligible for LIFT service if they have a physical or mental disability which prevents them from independently using Tri-Met buses or MAX. Individuals must apply for LIFT service and meet eligibility requirements before receiving transportation.

The *Transportation Planning Rule* defines a *Major Transit Stop* generally for light rail or transit transfer stations, or stops which are near (within 1/4 mile) intense development or uses which are likely to generate a high level of transit trips. Currently, no locations in Forest Grove meet that criteria. School bus service is provided to all students in Forest Grove, elementary through high school, who live farther than one-mile from the school or must cross a major street while walking to and from school.

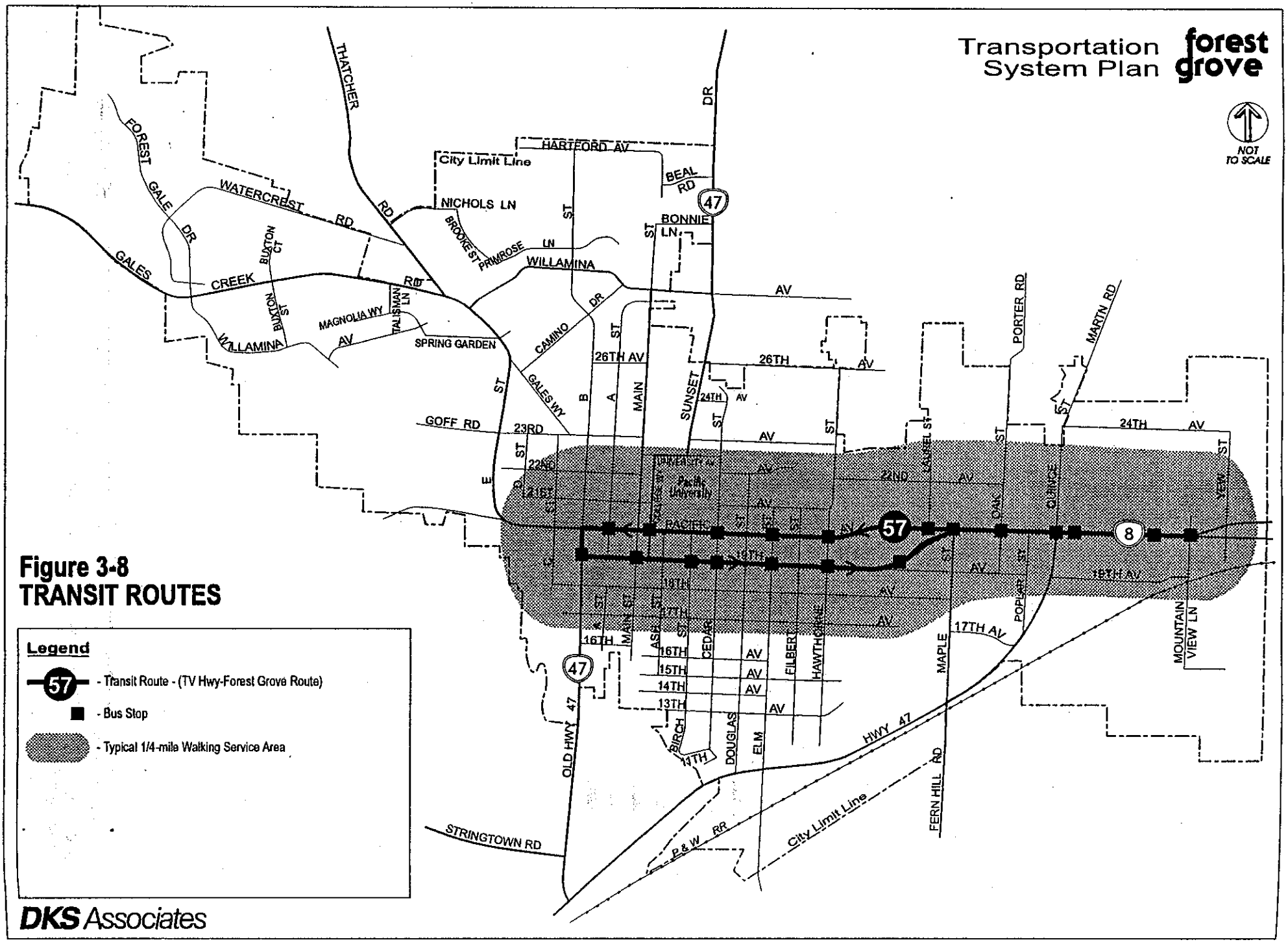
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Figure 3-8
TRANSIT ROUTES
Legend
57 - Transit Route - (TV Hwy-Forest Grove Route)
- Bus Stop
- Typical 1/4-mile Walking Service Area
DKS Associates
THATCHER RD
FOREST GALE DR
WATERCREST RD
GALES CREEK RD
BUXTON CT
BUXTON LN
TALISMAN LN
MAGNOLIA WY
WILLAMINA AV
SPRING GARDEN
CAMINO DR
GALES WY
GOFF RD
23RD
22ND
21ST
HARTFORD AV
City Limit Line
NICHOLS LN
BROOKE ST
PRIMROSE LN
WILLAMINA AV
BEAL RD
BONNIE LN
47
26TH AV
24TH AV
SUNSET
MAIN
A ST
B ST
C ST
D ST
E ST
F ST
G ST
26TH
24TH
22ND
21ST
20TH
19TH
18TH
17TH
16TH
15TH
14TH
13TH
PACIFIC
57
8
LAUREL ST
DAVIS ST
CLINCE
YEW
PORTER RD
MARTIN RD
17TH AV
18TH AV
POPLAR ST
MAPLE
MOUNTAIN VIEW LN
ASH ST
CEDAR
FILBERT
HAWTHORNE
DOUGLAS
ELM
BIRCH
OLD HWY 47
HWY 47
FERN HILL RD
STRINGTOWN RD
P & W RR
City Limit Line

Bicycle

Existing bike lanes and off-street multi-use paths are shown in Figure 3-9. Planned bikeways are not shown, but include the following locations. These and other facilities will be considered in the master plan to extend the bike facilities to existing and future neighborhoods.

- 19th Avenue/west of Maple Street to B Street
- B Street/Pacific Avenue to south City Limits
- College Way
- Pacific Avenue westbound/Mountain View Lane to Quince Street
- Pacific Avenue/Hawthorne Street to D Street
- Quince Street/Pacific Avenue to north City Limits
- Sunset Drive/University Avenue to north City Limits
- University Avenue

Except for Highway 47, bicycles are permitted on all roadways in Forest Grove. However, because there are very few shoulders in the City, bicycle use is low. Bicycle use in Forest Grove is generally used for recreational, school and commuting purposes.

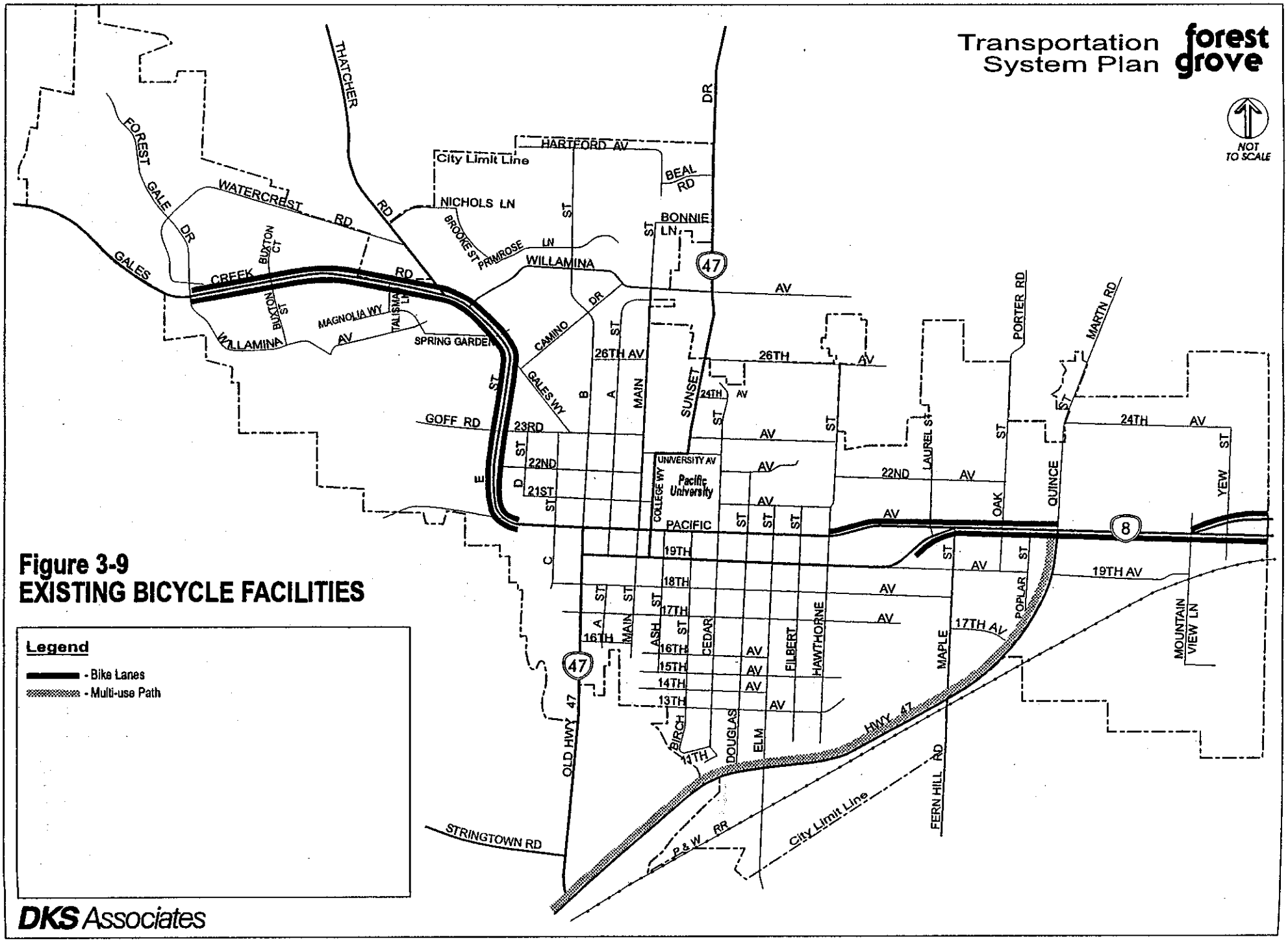

Figure 3-9
EXISTING BICYCLE FACILITIES

DKS Associates

Pedestrians

A majority of arterial and collector streets in Forest Grove do not have sidewalks on either side of the street. Figure 3-10 shows the existing pedestrian facilities in Forest Grove. Connectivity and pedestrian linkages are generally good on the arterial and collector street system in the downtown area. Although sidewalk availability on the arterial and collector street system is limited, some residential streets have sidewalks, especially in areas developed within the past ten to fifteen years. In addition to paved sidewalks, Forest Grove has multi-use paths. A multi-use path is located along Highway 47 and in most open spaces and parks.

Pedestrian counts were conducted during the morning (7:00 to 9:00 am.) and evening peak period (4:00 to 6:00 p.m.) at the seventeen selected intersections in Forest Grove. As shown on Figure 3-10, the pedestrian volumes were grouped into three categories:

- low (0 to 15 pedestrians per hour),
- medium (15 to 30 pedestrians per hour), and
- high (over 30).

Most of the counted locations have less than 15 pedestrians during the peak hour. This is considered to be a light level of usage. A moderately higher level of use was observed at two locations close to major schools: B Street/Willamina Avenue and Main Street/23rd Avenue. The highest level of use was on Pacific Avenue at Main Street and at College Way. The hourly pedestrian volume at Pacific/College exceeded 100 people per hour. This was highest pedestrian activity observed in the city.

Trucks

Currently, there are no designated principal truck routes in Forest Grove. The intent of the truck route system is to provide connections with truck routes serving areas within and outside of Forest Grove making efficient truck movement and the delivery of raw materials, goods, services and finished products possible. These routes are generally found in and serve areas where there are concentrations of commercial and/or industrial land uses.

Since the city does not have designated truck routes, the truck community relies on the designated state facilities as a default. The local elements of the state highway system includes TV Highway, the Southern Highway 47 Bypass, the downtown Pacific Avenue/19th Avenue couplet, and Gales Creek Road. The current north-south route involves Sunset Drive, University Way, College Way, Council Street and several blocks of Pacific Avenue and 19th Avenue. This north-south route bisects the heart of the downtown area. It will be replaced by the Northern Highway 47 Bypass once that facility is completed in 2002. Figure 3-11 shows truck routes within Forest Grove with percentages during the PM peak hour.

Rail

A Union (Southern) Pacific railroad route begins in Forest Grove (near 21st Avenue and Douglas Street) parallel to the Southern Highway 47 Bypass and then continues east along TV Highway. Trains run through Forest Grove at a rate of approximately XX per hour in each direction. Trains on this line are of varying types, including intermodal trains with containers, trailer beds or box-car type. None of the railroad crossings are grade separated. No improvements or changes in rail service are planned at this time. The single rail line in Forest Grove is shown in Figure 3-11.

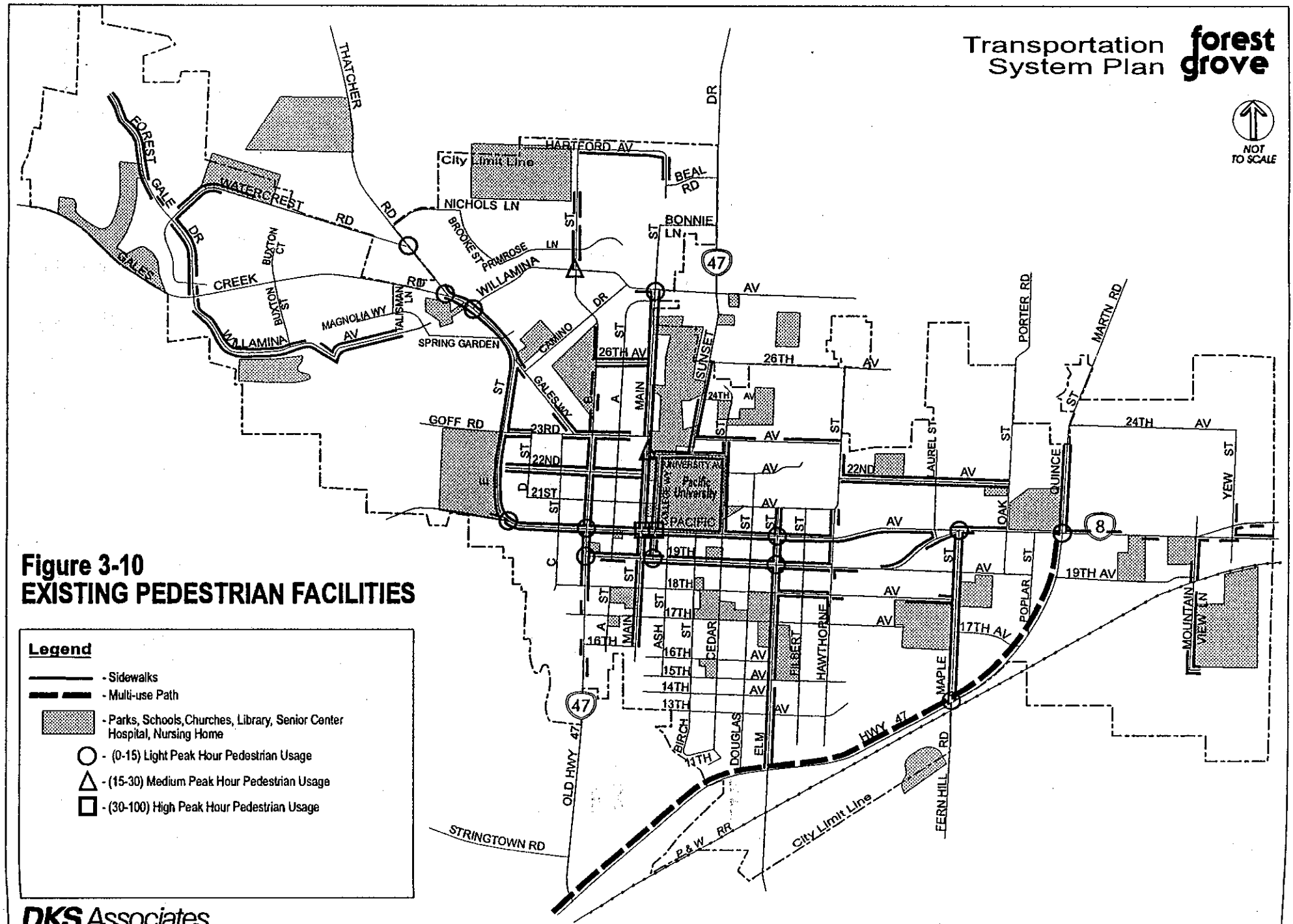

Figure 3-10
EXISTING PEDESTRIAN FACILITIES

Legend

- Sidewalks
- Multi-use Path
- Parks, Schools, Churches, Library, Senior Center Hospital, Nursing Home
- (0-15) Light Peak Hour Pedestrian Usage
- (15-30) Medium Peak Hour Pedestrian Usage
- (30-100) High Peak Hour Pedestrian Usage

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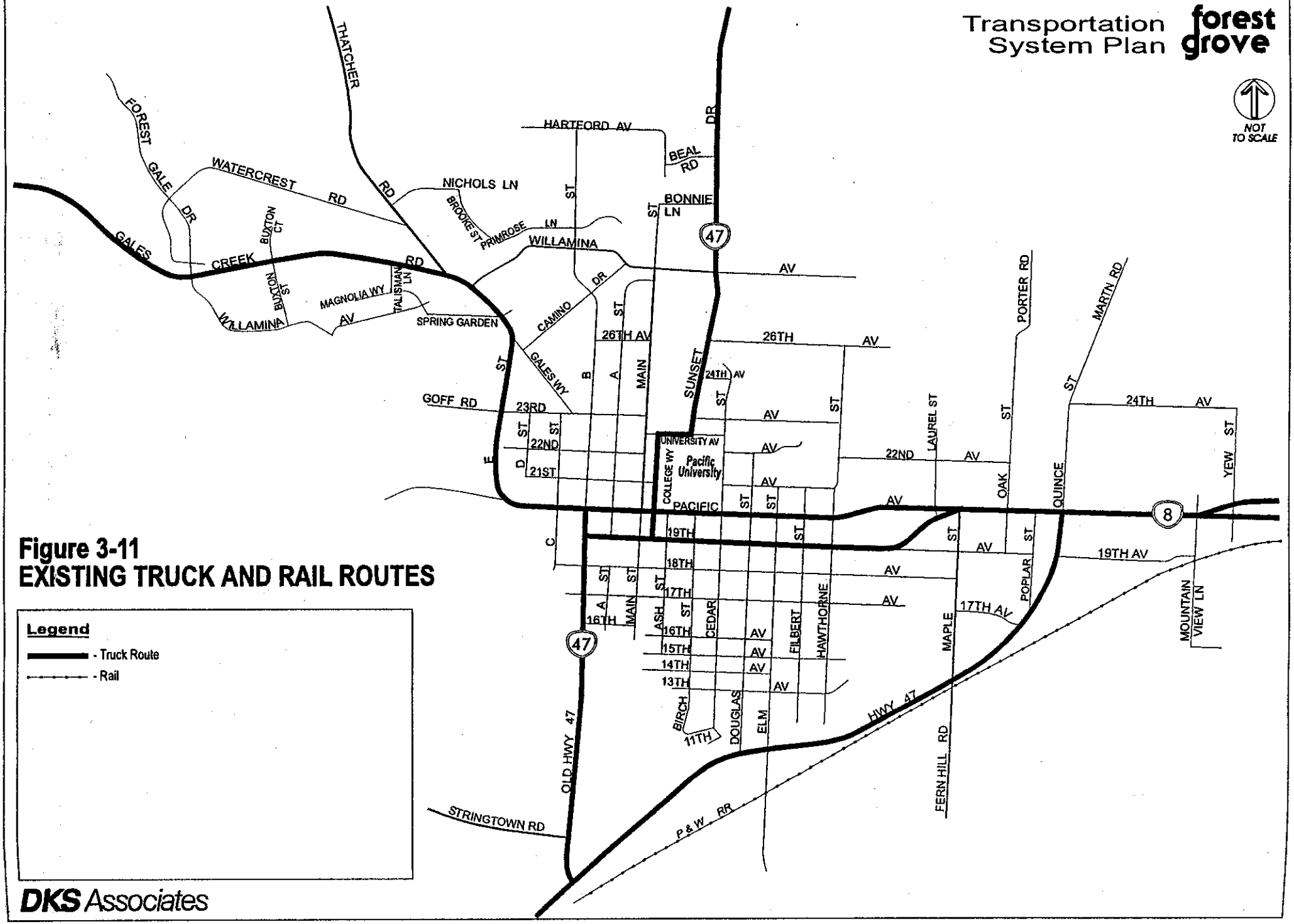


Figure 3-11
EXISTING TRUCK AND RAIL ROUTES

Legend

- Truck Route
- Rail

DKS Associates

Air

Forest Grove is served by the Portland International Airport, located in Northeast Portland on the Columbia River. The Portland International Airport is a major air transportation and freight facility, which serves Oregon and Southwest Washington. It provides a base for over twenty commercial airlines and air freight operations. The Port of Portland reported that 12.6 million passengers were served at the Portland International Airport in 1997.

Forest Grove is also served by the Hillsboro Airport, a general aviation facility located on the northern edge of Hillsboro. The airport is home to a number of private entities that provide aviation and aviation-related services, including scenic tours and other charter flights, helicopter and fixed-wing flight training, and aviation repair and maintenance.

Water

There are no navigable waters within Forest Grove.

Pipeline

The only major pipeline facilities running through the Forest Grove area is a high-pressure natural gas feeder line owned and operated by Northwest Natural Gas Company. The feeder line route enters Forest Grove along Porter Road/Oak Street and ends just north of Highway 8.

Planned Improvements

Several roadway improvements are already planned for the Forest Grove area by various agencies. Where possible, the agency responsible for the project and project dates are provided. Washington County MSTIP mentioned above are summarized below. These projects are funded by Washington County with some federal assistance. Metro's Regional Transportation Plan includes elements for state facilities that are federally mandated (STIP) and other local plan components (MTIP). The listing below summarizes the planned improvements as of the Regional Transportation Plan dated November 4, 1998 in the vicinity of Forest Grove.

Table 3-7: Planned Transportation Improvements

Description/Location	*Project/Limits*	*Funds*	*Funding Program*	*Schedule*
David Hill Road Connector	Thatcher Road to Sunset Drive	N/A	MTIP	N/A
Forest Grove Connectivity Improvements	▪ Yew to Holladay ▪ 23rd to 24th Avenue ▪ Main Street to Bonnie Lane ▪ Heather Street	N/A	MTIP	N/A
Forest Grove Northern Arterial	New 2-lane facility with sidewalks and bike lanes between Quince Street and Sunset Drive	$6.0 M	MTIP/MSTIP	2000-2005
Gales Creek Road Intersection Realignment	Gales Creek Road at Thatcher Road. Re-align intersection to increase capacity and safety.	N/A	N/A	N/A
Highway 8 Improvements	Complete boulevard design improvements	$8.0 M	MTIP	2006-2010
North Forest Grove Connector	North of Willamina Avenue in Forest Grove	$5.7 M	MTIP	N/A
Route 66 BFG-TV Highway	Beaverton Town Center to Forest Grove; more frequent bus service	N/A	MTIP	N/A
Sunset Drive	University Avenue to Beal Road. Widen to 3-lanes bike lanes, signals and sidewalks	$5.7 M	MSTIP	2006-2010
Town Center Pedestrian Improvements	TV Highway, Pacific, 19th, College Way, Sunset Drive, B Street and intersections.	$2.1 M	MSTIP	2000-2005
TV Highway (Pacific/19th) Bikeway	Hawthorne to "E" Street; Retrofit to include bike lanes	$100,000	MTIP	2000-2005
US 26 to Forest Grove Connectivity Improvements	Martin Road and Cornelius-Scheflin Road Intersections with Verboort Road	$12.3 M	MSTIP	2006-2010

Source: Metro

Chapter 4: Future Demand and Land Use

This chapter summarizes the methodology used to obtain future year forecasts for various modes in the City of Forest Grove.

The plan for street improvements within Forest Grove depends on determining existing needs and needs of future growth. As a first step in assessing future needs, Metro's urban area traffic forecast model was identified as a source for determining future traffic volumes in Forest Grove. This traffic forecast model translates land uses into roadway volume projections. These traffic volume projections form the basis for identifying potential roadway deficiencies and for evaluating alternative circulation improvements. This section describes the forecasting process, including key assumptions and the analysis of the land use scenario developed from the current Comprehensive Plan development designations and allowed densities. Future change of these variables could significantly change the future travel forecast.

Projected Land Uses

Land use is a key factor in how the transportation system operates. The amount of land that is developed, the type of land uses and how the land uses are mixed together have a direct relationship to expected demands on the transportation system. Understanding the amount and type of land use is critical to taking actions to maintain or enhance transportation system operation.

Projected land uses were developed for all areas within the urban growth boundary reflecting the comprehensive plan and Metro's land use assumptions for year 2020. Complete land use data sets were developed for the following conditions:

- Existing 1994 Conditions
- Year 2020

The base year model is updated every few years. For this study effort, the available base model provided by Metro was for 1994. Land uses were inventoried throughout Forest Grove (and the adjacent jurisdictions) by Metro. This land use database includes the number of dwelling units, number of retail employees and number of other employees. Table 4-1 summarizes the land uses for existing conditions and the future scenario in the Forest Grove area.[1] A detailed summary of the land uses for each Transportation Analysis Zone (for both

1 Based on Metro's 2020 land use forecasts.

the 1994 and 2020 model years) is listed in Table 4-2. These data are updated regionally providing more detailed information. As the land use data is updated in the future, TSP updates can reflect current conditions and new forecasts.

If land uses are significantly changed in proportion to each other (i.e. there is a significant increase in retail employment relative to households), there will be a shift in the overall operation of the transportation system. Retail land uses generate significantly higher numbers of trips than do households and other land uses. The location and design of retail land uses in a community can greatly affect transportation system operation. Additionally, if a community is homogeneous in land use character (i.e. all employment, all residential), the system must support export of trip making. Typically, there should be both residential type land uses as well as employment type land uses so that some residents may work locally, reducing the need for residents to commute long distances to work. Forest Grove has a mix of land uses, however, many residents must travel outside the City for employment opportunities.

Table 4-1: Forest Grove Area Land Use Summary

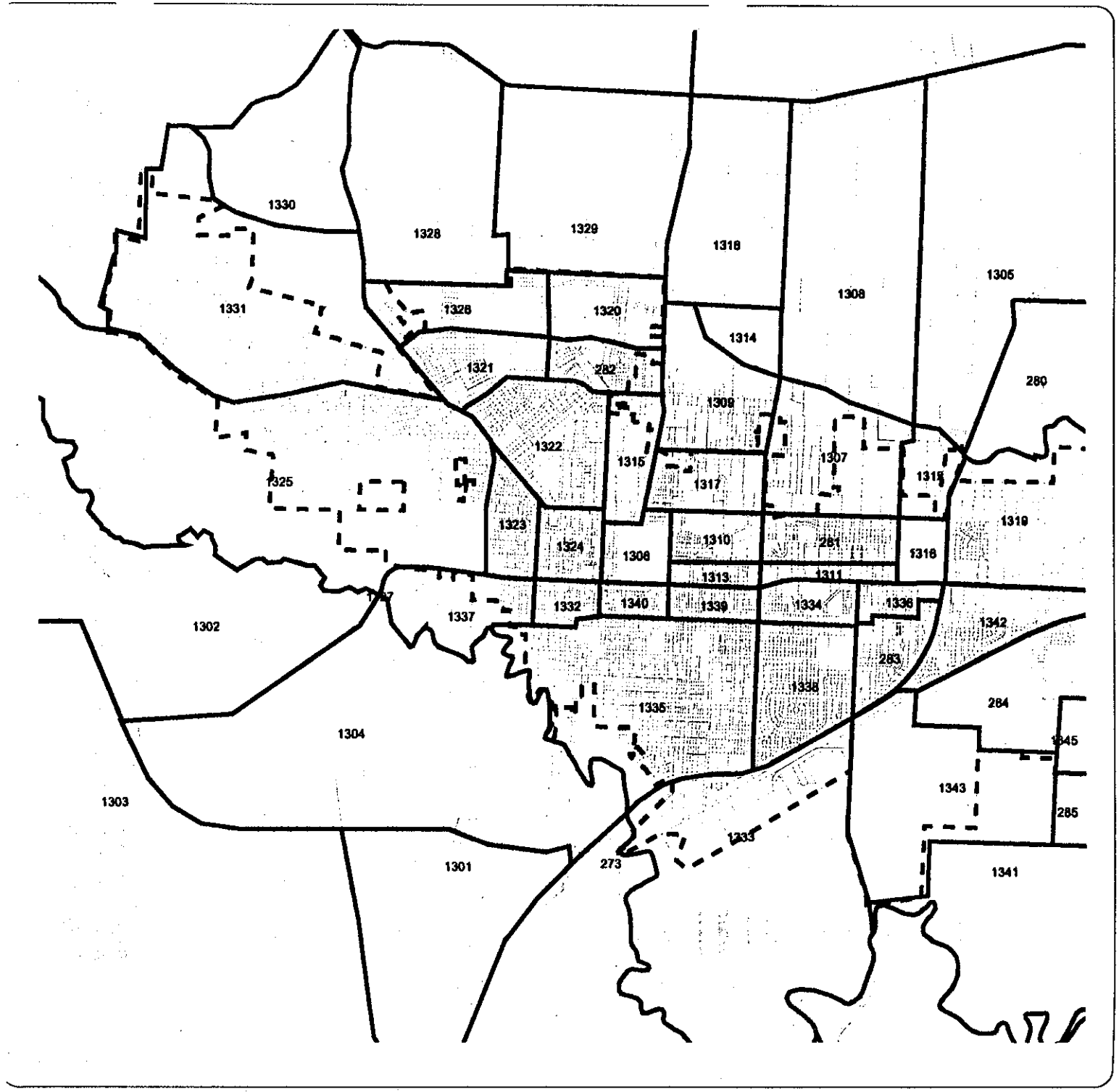
Land Use	*1994*	*2020*	*Growth*	*Percent Increase*
Households	9,978	15,023	5,045	+51%
Retail Employees	1,691	3,544	1,853	+110%
Other Employees	10,967	18,104	7,137	+65%

Source: Metro. Totals included areas outside of the city limits within the greater city planning area.

Table 4-1 indicates that a significant amount of growth is expected in Forest Grove area in the coming years. These land use quantities should be monitored to make sure that Forest Grove is working to achieve a balance of land use that is compatible with the available transportation system. This TSP balances transportation needs with the forecasted 2020 land uses.

Land uses were inventoried throughout Forest Grove by Metro. This land use data base includes the number of dwelling units, number of retail employees and number of other employees. Table 4-2 summarizes the land uses for existing conditions and the future scenario by transportation analysis zones (TAZ's).

For traffic forecasting, the land use data is stratified into geographical areas called traffic analysis zones (TAZ's) which represent the sources of vehicle trip generation. There are about 10-15 Metro TAZ's which represent Forest Grove and its vicinity. These 10-15 TAZ's were disaggregated, as part of this plan, into about 50-60 TAZ's to more specifically represent land use in and around Forest Grove. The original Metro and disaggregated model zone boundaries are shown in Figure 4-1. Metro uses EMME/2, a computer based program for transportation planning, to process the large amounts of data for the Portland Metropolitan area.



Forest Grove Transportation Analysis Zones

TAZ's

City Limits

Tax Lots

N

0 0.2 0.4 0.6 0.8 Miles

Figure 4-1

Table 4-2: Forest Grove Land Use Summary

	Households		Retail Employees		Other Employees	
TAZ	1994	2020	1994	2020	1994	2020
272	890	1088	236	277	1178	1234
273	8	9	0	0	0	1
274	159	161	35	39	773	777
276	138	141	3	5	70	106
278	90	95	0	0	12	18
279	31	34	0	0	17	18
280	773	1319	263	885	685	2046
281	625	654	3	22	22	122
282	26	105	0	2	3	17
283	205	243	12	28	51	101
284	35	175	43	227	204	973
285	1	6	0	0	0	2
1301	12	13	0	0	0	0
1302	7	8	0	0	0	0
1303	1294	1394	12	16	1012	1153
1304	20	21	3	3	253	261
1305	2	8	0	1	0	6
1306	43	59	59	67	408	450
1307	97	305	15	73	103	411
1308	2	9	0	0	0	2
1309	44	324	0	60	1	318
1310	63	105	43	61	293	391
1311	0	65	34	50	232	317
1312	9	93	2	59	17	318
1313	8	45	23	31	155	201
1314	0	12		8	0	43
1315	201	243	14	23	98	143
1316	0	13	0	8	0	40
1317	386	436	35	51	243	328
1318	161	177	23	28	155	182
1319	197	447	198	311	1364	1962
1320	18	119	0	3	3	20
1321	28	124	4	7	42	60
1322	489	566	15	22	153	198
1323	272	299	7	11	74	100
1324	252	316	44	53	435	501
1325	177	524	35	46	347	420
1326	84	190	1	4	13	34
1328	0	197	0	5	0	32
1329	0	3	0	0	0	0
1330	2	305	0	7	0	50
1331	333	908	6	22	59	169
1332	0	35	85	120	352	467
1333	0	23	48	167	200	585

TAZ	Households		Retail Employees		Other Employees	
	1994	2020	1994	2020	1994	2020
1334	2	61	57	75	237	294
1335	1126	1232	71	160	294	585
1336	16	48	30	43	124	166
1337	107	188	4	23	15	78
1338	171	270	20	44	83	162
1339	20	66	43	72	178	274
1340	4	49	69	108	286	413
1341	0	2	0	0	0	0
1342	258	352	17	67	91	323
1343	0	16	67	124	276	463
1344	371	440	3	7	105	205
1345	722	884	8	20	248	567
Total	9,978	15,023	1,691	3,544	10,967	18,104

Source: Metro

Metro Area Traffic Model

The development of future traffic system needs for Forest Grove depends on the ability to accurately forecast travel demand resulting from estimates of future population and employment for the City. The objective of the transportation planning process is to provide the information necessary for making decisions on when and where improvements should be made in the transportation system to meet travel demands.

Metro has developed an urban area travel demand model as part of the Regional Transportation Plan Update process to help identify street and roadway needs. Traffic forecasting can be divided into several distinct but integrated components that represent the logical sequence of travel behavior (Figure 4-2). These components and their general order in the traffic forecasting process follow:

- Trip Generation
- Trip Distribution
- Mode Choice
- Traffic Assignment

The initial roadway network used in the traffic model was the existing streets and roadways. Future land use scenarios were tested and roadway improvements were added in to mitigate traffic conditions, using programmed improvements as a starting basis. Forecasts of PM peak hour traffic flows were produced for every major roadway segment within the Forest Grove. Traffic volumes are projected on most arterials and collector streets. Some local streets are included in the model, but many are represented by centroid connectors in the model process.

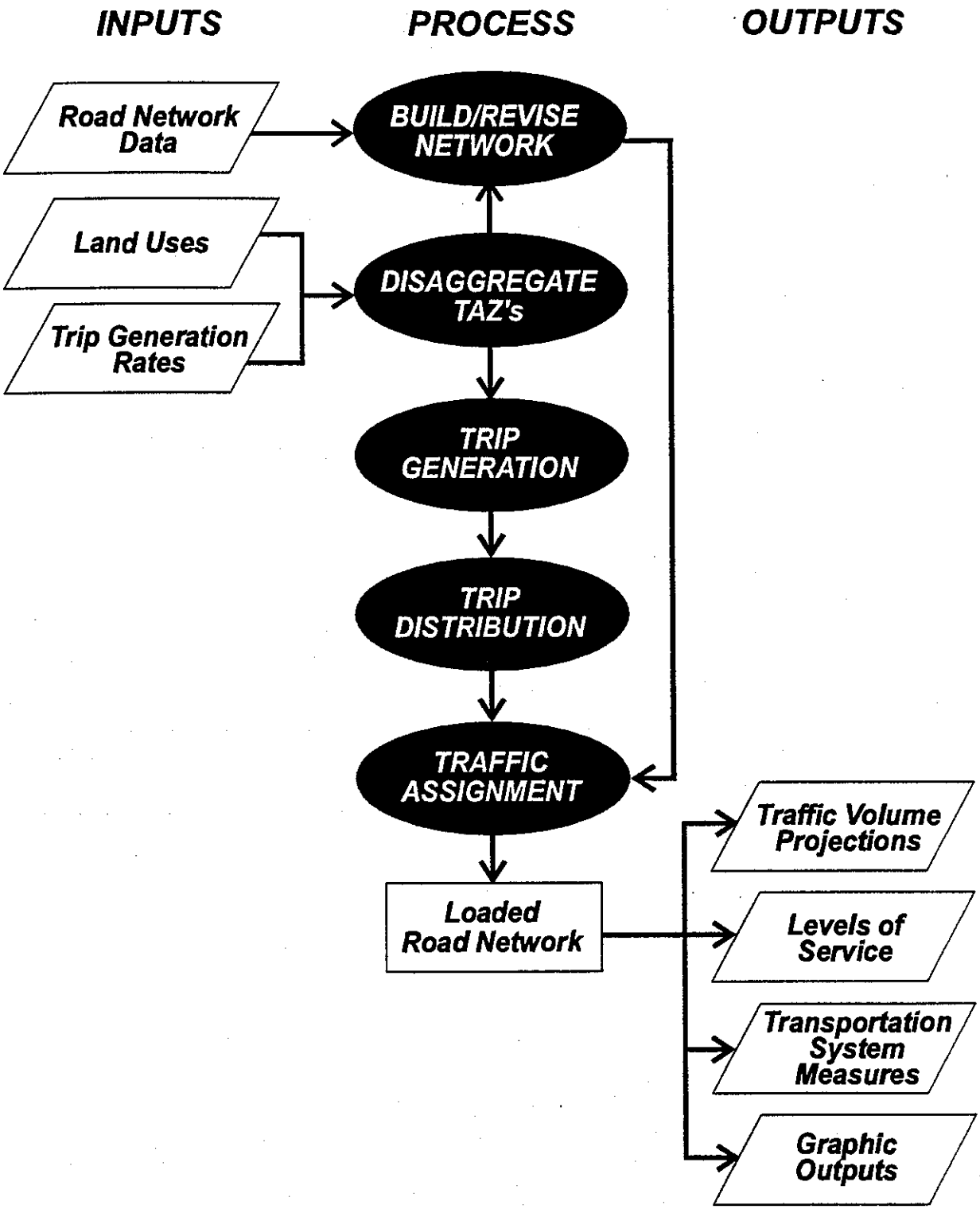


Figure 4-2
TRAFFIC FORECASTING MODEL PROCESS

Trip Generation. The trip generation process translates land use quantities (in numbers of dwelling units and retail and other employment) into vehicle trip ends (number of vehicles entering or leaving a TAZ) using trip generation rates established during the model verification process. The trip rates were based upon Institute of Transportation Engineers research[2] and documentation and adjusted to suit the Portland area in the calibration process. PM peak hour trip rates used in the Metro model are summarized in Table 4-3.

Table 4-3: Average PM Peak Hour Trip Rates Used in Metro Model

Unit	*Average Trip Rate/Unit*		
	In	Out	Total
Household	0.43	0.19	0.62
Retail Employee	0.78	0.69	1.47
Other Employee	0.07	0.29	0.36

Source: Metro

Table 4-4 illustrates the estimated growth in daily vehicle trips generated within the Forest Grove, between 1994 and 2020. It indicates that vehicle trip generation in Forest Grove would grow by approximately 57 percent (almost double) between 1994 and 2020 if the land develops according to Metro's assumptions. Assuming a 20 year time horizon to the 2020 scenario, this represents a growth rate of about two percent per year.

Table 4-4: Existing and Future Trip Generation -- PM Peak Hour Vehicle Trips

Trips	*1994*	*2020*	*Growth*	*Percent Increase*
Forest Grove Area	13,392	21,041	7,649	+57%

Source: Metro

Trip Distribution. This step estimates how many trips travel from one zone in the model to any other zone. The distribution is based on the number of trip ends generated in each zone pair, and on factors that relate the likelihood of travel between any two zones to the travel time between the zones.

In projecting long-range future traffic volumes, it is important to consider potential changes in regional travel patterns. Although the locations and amounts of traffic generation in Forest Grove are essentially a function of future land use in the city, the distribution of trips is influenced by growth in neighboring areas such as Hillsboro, Beaverton, Portland, etc. External trips (trips which have either an origin or destination in Forest Grove and the other trip end outside Forest Grove) and through trips (trips which pass through Forest Grove and have neither an origin nor a destination there) were projected using trip distribution patterns based upon census data and traffic counts performed at gateways into the Metro area UGB.

2 *Trip Generation Manual, 6th Edition*, Institute of Transportation Engineers, 1997.

Mode Choice. This is the step where it is determined how many trips will be by single-occupant vehicle, transit or carpool. The 1994 mode splits would be incorporated into the base model and adjustments to that mode split may be made for the future scenario, depending on any expected changes in transit or carpool use. These considerations are built into the forecasts used for 2020.

Traffic Assignment. In this process, trips from one zone to another are assigned to specific travel routes in the roadway network, and resulting trip volumes are accumulated on links of the network until all trips are assigned.

Different models are actually used for auto assignment versus transit assignment. Various techniques exist for auto assignment, such as all-or-nothing, stochastic, incremental capacity restraint and equilibrium capacity restraint. The EMME/2 package, among others, uses the equilibrium capacity restraint technique, which is considered to produce the most realistic network traffic loading of all the techniques. With this technique, the auto trips are assigned iteratively to the network in such a way that the final traffic loading will closely approximate the true network "equilibrium." Network equilibrium is defined as the condition where no traveler can achieve additional travel time savings by switching routes. Between iterations, network travel times are updated to reflect the congestion effects of the traffic assigned in the previous iteration. Congested travel times are estimated using what are called "volume-delay functions" in EMME/2. There are different forms of volume/delay functions, all of which attempt to simulate the capacity restraint effect of how travel times increase with increasing traffic volumes. The volume-delay functions take into account the specific characteristics of each roadway link, such as capacity, speed, and facility type.

Model Verification. The base 1994 modeled traffic volumes were compared against actual traffic counts across screenlines, on key arterials and at key intersections. Most arterial traffic volumes are closely replicated, even down to turn movements by the model based upon detailed calibration. Based on this performance, the model was used for future forecasting and assessment of circulation changes.

Model Application To Forest Grove

Intersection turn movements were extracted from the model at key intersections for both year 1994 and year 2020 scenarios. These intersection turn movements were not used directly, but the increment of the year 2020 turn movements over the year 1994 turn movements was applied (added) to existing (actual 1998) turn movement counts in Forest Grove. Actual turn movement volumes used for future year intersection analysis can be found in Chapter 8: Motor Vehicles.

Chapter 5: Pedestrians

This chapter summarizes existing and future pedestrian needs in the City of Forest Grove, outlines the criteria to be used in evaluating these needs, provides a number of strategies for implementing a pedestrian plan and recommends a pedestrian Action Plan for the City of Forest Grove. The needs, criteria and strategies were identified in working with the City's TSP Technical Advisory Committee. This committee provided input regarding the transportation system in Forest Grove, specifically exploring pedestrian needs. The methodology used to develop the pedestrian plan combined citizen and staff input, specific Transportation Planning Rule requirements[1] and continuity to the regional pedestrian network.[2]

Needs

A limited number of sidewalks are provided on the arterial and collector roadways (see Figure 3-10) in the City of Forest Grove, resulting in a fair existing pedestrian network. However, several residential subdivisions in Forest Grove are relatively new and a majority of them have sidewalks available. Continuity and connectivity are key issues for pedestrians in Forest Grove since, generally, if there is a sidewalk available, there will be sufficient capacity. In other words, it is much more important that a continuous sidewalk be available than that it be of a certain size or type.

The most important existing pedestrian needs in Forest Grove are providing sidewalks on arterials and collectors and connectivity to key activity centers in the City. This includes safe, well lighted arterial and collector streets which can act as barriers to pedestrian movement if safe facilities are not provided. In the future, pedestrian needs will be similar, but there will be additional activity centers that will need to be considered and interconnected.

Walkway needs in Forest Grove must consider the three most prevalent trip types:

- Residential based trips – home to school, home to home, home to retail, home to park, home to transit, home to entertainment, home to library
- Service based trips – multi-stop retail trips, work to restaurant, work to services, work/shop to transit
- Recreational based trips – home to park, exercise trips, casual walking trips

Residential trips need a set of interconnected sidewalks radiating out from homes to destinations within one-half to one mile. Beyond these distances, walking trips of this type become significantly less common (over 20 minutes). Service based trips require direct, conflict-free

1 *Transportation Planning Rule*, State of Oregon, DLCD, Sections 660-12-020(2)(d) and 660-12-045-3.

2 Version 4.0, *Regional Pedestrian System*, December 1, 1997.

connectivity between uses (for example, a shopping mall with its central spine walkway that connects multiple destinations). Service based trips need a clear definition of connectivity. This requires mixed use developments to locate front doors which relate directly to the public right-of-way and provide walking links between uses with one-half mile. Recreational walking trips have different needs. Off-street trails, well landscaped sidewalks and relationships to unique environmental features (creeks, trees, farmland) are important.

Because all of these needs are different, there is no one pedestrian solution. The most common need is to provide a safe and interconnected system that affords the opportunity to consider the walking mode of travel, especially for trips less than one mile in length.

Facilities

Sidewalks should be built to current design standards of the City of Forest Grove /Washington County and in compliance with the Americans with Disabilities Act (at least four feet of unobstructed sidewalk).[3] Wider sidewalks may be constructed in commercial districts or on arterial streets. Additional pedestrian facilities may include accessways, pedestrian districts and pedestrian plazas, as defined in the *Transportation Planning Rule*:[4]

- *Accessway*: A walkway that provides pedestrian and/or bicycle passage either between streets or from a street to a building or other destination such as a school, park or transit stop.
- *Pedestrian District*: A plan designation or zoning classification that establishes a safe and convenient pedestrian environment in an area planned for a mix of uses likely to support a relatively high level of pedestrian activity.
- *Pedestrian Plaza*: A small, semi-enclosed area usually adjoining a sidewalk or a transit stop which provides a place for pedestrians to sit, stand or rest.

These designations will be provided as the TSP is implemented. Any pedestrian districts, for example the area near Pacific University, may be identified in further studies which address pedestrian issues.

Sidewalks should be sized to meet the specific needs of the adjacent land uses and needs. Guidance to assess capacity needs for pedestrians can be found in the *Highway Capacity Manual and Pushkarev and Zupan*.[5] Typically, the base sidewalks sizing for local and neighborhood routes should be 5 feet.

As functional classification of roadways change, so should the design of pedestrian facilities. Collectors may need to consider minimum sidewalk widths of 6 to 8 feet and arterials should have sidewalk widths of 6 to 10 feet. Wider sidewalks may be necessary depending upon urban design needs and pedestrian flows (for example, adjacent to storefront retail or near transit stations). Curb-tight sidewalks are generally acceptable at the local and neighborhood route classification, however, with high vehicle volumes and on collector/arterial streets, landscape strips between the curb and the sidewalk should be required. Where curb-tight sidewalks are the

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3 *Americans with Disabilities Act*, Uniform Building Code.

4 *Transportation Planning Rule*, State of Oregon, Department of Land Conservation and Development, OAR-660-12-005(2, 14 and 15).

5 *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994; Chapter 13; and Pushkarev, Zupan, Urban Spaces for Pedestrians, 1975.

only option, additional sidewalk width should be provided to accommodate the other street side features (light poles, mail boxes, etc.).

Retro-Fit Alternative – Another alternative to retro-fitting with conventional sidewalks is constructing sidewalks inside an existing curb. This can be feasible where adequate paved width is available, and existing storm drainage allows. For example, a 40-foot wide pave roadway with curbs can be retro-fitted with five-foot sidewalks inside the curb line. This would leave a paved travel way of 30 feet, and that is typically adequate for the lesser collector facilities (e.g., B Street, Willamina Avenue).

Criteria

Forest Grove's Technical Advisory Committee created a set of goals and policies to guide transportation system development in Forest Grove (see Chapter 2). Several of these policies pertain specifically to pedestrian needs:

Table 5-1: Pedestrian Facility Goals and Policy Criteria

Goal	*Policy*	*Description*
Goal 1: Livability	Policy 2:	Encourage pedestrian accessibility by providing safe, secure and desirable pedestrian routes.
Goal 2: Balanced Transportation System	Policy 4:	Sidewalks must be constructed on all streets within Forest Grove (with construction or reconstruction projects), except where a specific alternative plan has been developed. All schools, parks, public facilities and retail areas shall have direct access to a sidewalk
	Policy 5:	Bicycle and pedestrian plans shall be developed which link to recreational trails.
	Policy 6:	Local streets shall be designed to encourage a reduction in trip length by providing connectivity and limiting out-of-direction travel. Provide connectivity to activity centers and destinations with a priority for pedestrian connections
Goal 3: Safety	Policy 3:	Safe and secure pedestrian and bicycle ways shall be designed between parks and other activity centers in Forest Grove.
	Policy 4:	Safe and secure routes to schools shall be designed for each school and any new residential project shall identify the safe path to school for children
Goal 5: Accessibility	Policy 1:	Design and construct transportation facilities to meet the requirements of the Americans with Disabilities Act.

These goals and policies are the criteria that all pedestrian improvements in Forest Grove should be compared against to determine if they conform to the intended vision of the City.

Strategies

Several strategies were evaluated by the Technical Advisory Committee for future pedestrian projects in Forest Grove. These strategies aimed at providing the City with priorities to direct its funds toward pedestrian projects that meet the goals and policies of the City:

Strategy 1 - "Fill in Gaps in the Network Where Some Sidewalks Exist"

This strategy provides sidewalks which fill in the gaps between existing sidewalks where a significant portion of a pedestrian corridor already exists. This strategy maximizes the use of existing pedestrian facilities to create complete sections of an overall pedestrian network.

Strategy 2 - "Pedestrian Corridors that Connect Neighborhoods"

This strategy puts priority on linking neighborhoods together with pedestrian facilities. This can include walkways at the end of cul-de-sacs and direct connections between neighborhoods (avoiding "walled" communities).

Strategy 3 - "Connect Key Pedestrian Corridors to Schools, Parks, Recreational Uses & Activity Centers"

This strategy provides sidewalks leading to activity centers in Forest Grove, such as schools and parks. This strategy provides added safety on routes to popular pedestrian destinations by separating pedestrian flow from auto travel lanes. These routes are also common places that children may walk, providing them safer routes. A key element of this strategy is to require all new development to define direct safe pedestrian paths to parks, activity centers, schools and transit (in the future) within one mile of the development site. Direct will be defined as 1.25 times the straight line connection to these points from the development. Any gaps (off-site) will be defined (location and length).

Strategy 4 - "Reconstruct All Existing Substandard Sidewalks to City of Forest Grove Standards"

This strategy focuses on upgrading any substandard sidewalks to current city standards. Current standards are for five foot sidewalks to meet ADA[6] requirements. Several sidewalks exist that do not meet the minimum five foot requirement. Fronting property owners are responsible for sidewalk maintenance where pavement has fallen into disrepair.

Strategy 5 – "Pedestrian Corridors that Connect to Major Recreational Facilities"

This strategy provides a connection between the sidewalk network and major recreational facilities, such as the 40-mile loop.

Strategy 6 – "Transit Facilities"

This strategy provides sidewalks leading to major transit facilities, such as bus stops which service a high volume of riders. This strategy increases pedestrian safety and encourages transit use.

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6 *Americans with Disabilities Act*, Uniform Building Code.

Table 5-2 provides an assessment of how each of the strategies meets the requirements of each of the goals and policies.

Recommended Pedestrian Facility Plan

The strategies that had been evaluated by the Technical Advisory Committee were ranked by each member of the committee according to his or her vision of priorities for the City of Forest Grove. The ranking of these strategies is listed in Table 5-2 from most important to least important. Four strategies were considered to be a high priority for pedestrians in Forest Grove. These strategies were filling in network gaps, connections to transit facilities, connections between neighborhoods and connections to schools, parks, and activity centers.

A list of likely actions to achieve fulfillment of these priorities was developed into a Pedestrian Master Plan. The Pedestrian Master Plan (Figure 5-1) is an overall plan and summarizes the "wish list" of pedestrian-related projects in Forest Grove. From this Master Plan, a more specific, shorter term, Action Plan was developed. The Action Plan consists of projects that the City should give priority to in funding. As development occurs, streets are rebuilt and other opportunities (such as grant programs) arise, projects on the Master Plan should be pursued as well.

Table 5-2: Pedestrian Facility Strategies Comparison

Strategy	*Policies*						
	1-2	*2-4*	*2-5*	*2-6*	*3-3*	*3-4*	*5-1*
1. Fill in gaps in network where some sidewalks exist	★★	★★	★★	★★	★★	★★	★
2. Connect pedestrian corridors to major transit facilities	★	★	○	★★	★	○	★
3. Pedestrian corridors that connect neighborhoods	★★	★★	★	★★★	★	★	★
4. Connect key pedestrian corridors to schools, parks & activity centers	★★★	★★★	★★★	★★★	★★★	★★★	★
5. Connect to major recreational uses	★	★★	★★★	★★	★★★	○	★
6. Reconstruct all sidewalks to city standards	★	★	★	★	★	★	★★★

○	Does not meet criteria	★★	Mostly meets criteria
★	Partially meets criteria	★★★	Fully meets criteria

It should be noted that it is preferable to provide pedestrian facilities on one side of the street if it means a longer section of the system could be covered (i.e. sidewalk on one side of the street for two miles is preferable to sidewalk on both sides of the street for one mile). Development shall still be responsible for any frontage improvements, even if a pedestrian facility already exists opposite the proposed development. Sidewalks on both sides of all streets is the ultimate desire.

Potential Project List

Table 5-3 outlines potential pedestrian projects in Forest Grove. The City, through its Capital Improvement Program (CIP), joint funding with other agencies (Washington County, Metro) and development approval would implement these projects. The following considerations should be made for each sidewalk installation:

- Every attempt should be made to meet City standards
- Sidewalks should be a minimum of five feet wide
- Landscape strips should be considered and are encouraged (see standard street cross-sections in Motor Vehicles chapter)

Table 5-3: Potential Pedestrian Projects

*Rank**	*Location*	*From*	*To*
Action Plan Projects			
H-1	B Street	26th Avenue	Willamina Avenue
H-2	College Way	Pacific Avenue	21st Avenue
H-3	University Avenue	Sunset Drive	Main Street
H-4	18th Avenue	Hawthorne Street	Maple Street
H-5	Bonnie Lane Path	Gales Creek Road	Brooke Street
H-6	Willamina Avenue	Gales Creek Road	Main Street
H-7	Hawthorne Street	South End	Hwy. 47 Bypass
H-8	Cedar Street	South End	Hwy. 47 Bypass
H-9	19th Avenue	Hawthorne Street	Ballad Town Shops
H-10	23rd Avenue	Cedar Street	Hawthorne Street
H-11	Lincoln Park Trails	University Avenue	N/o 26th Avenue
Master Plan Projects			
M-1	Sunset Drive	Hwy. 47 Bypass	24th Avenue
M-2	Fern Hill Road	Hwy. 47 Bypass	South city limit
L-1	Council Creek Pathways	Martin Road	Beal Road
L-2	Gales Creek Pathways	Willamina Avenue	Hwy. 47 Bypass

Note: H=High, M=Medium, L=Low Priority

Complementing Land Development Actions

It is important that, as new development occurs, connections or accessways are provided to link the development to the existing pedestrian facilities in as direct manner as possible. As a guideline, the sidewalk distance from the building entrance to the public right-of-way should not exceed 1.25 times the straight line distance. If a development fronts a proposed sidewalk (as shown in the Pedestrian Master Plan), the developer shall be responsible for providing the walkway facility as part of any frontage improvement required for mitigation. It is also very important that residential developments consider the routes that children will use to walk to school and provide safe and accessible sidewalks to accommodate these routes, particularly within one mile of a school site. Additionally, all commercial projects generating over 1,000 trip ends per day should provide a pedestrian connection plan showing how pedestrian access to the site links to adjacent uses, the public right-of-way and the site front door. Conflict free paths and traffic calming elements should be identified, as appropriate.

Address Gaps in Pedestrian System

Many of the areas developed in Forest Grove 5 to 100 years ago did not provide sidewalks. These areas create gaps in the pedestrian walking system that become more important as land development continues. Current land developments build sidewalks on project frontages, but have little means or incentive to extend sidewalks beyond their property. Property owners without sidewalks are unlikely to independently build sidewalks that do not connect to anything. In fact, some property owners are resistant to sidewalk improvements due to cost (they do not want to pay) or changes to their frontage (they may have landscaping in the public right-of-way). As an incentive to fill some of these gaps concurrent with development activities, the City could consider an annual walkway fund that would supplement capital improvement-type projects. A fund of about $40,000 to $50,000 per year could build over a quarter mile of sidewalk. If matching funds were provided, over double this amount may be possible. The fund could be used several ways:

- Matching other governmental transportation funds to build connecting sidewalks identified in the master plan.
- Matching funds with land use development projects to extend a developer's sidewalks off-site to connect to non-contiguous sidewalks.
- Supplemental funds to roadway projects which build new arterial/collector sidewalks to create better linkages into neighborhoods.

Parks and Trails Development

The City Parks and Recreation Department and Metro Greenspaces programs are responsible for the majority of off-street trail opportunities. These two agencies must coordinate their pedestrian plans to provide an integrated off-street walking system in Forest Grove. Recent Metro Greenspaces initiatives and City park projects provide an opportunity to implement the off-street trails in Forest Grove as an integrated element of the pedestrian action plan.

Safety

Pedestrian conflicts with motor vehicles are a major issue in pedestrian safety. These conflicts can be reduced by providing direct links to buildings from public rights-of-way, considering neighborhood traffic management (see Chapter 8: Motor Vehicles), providing safe roadway crossing points and analyzing/reducing the level of pedestrian/vehicle conflicts in every land use application.

In setting priorities for the pedestrian action plan, school access was given a high priority to improve safety. However, beyond simply building more sidewalks, school safety involves education and planning. Many cities have followed guidelines provided by Federal Highway Administration and Institute of Transportation Engineers. Implementing plans of this nature has demonstrated accident reduction benefits. However, this type of work requires staffing and coordination by the School District as well as the City to be effective.

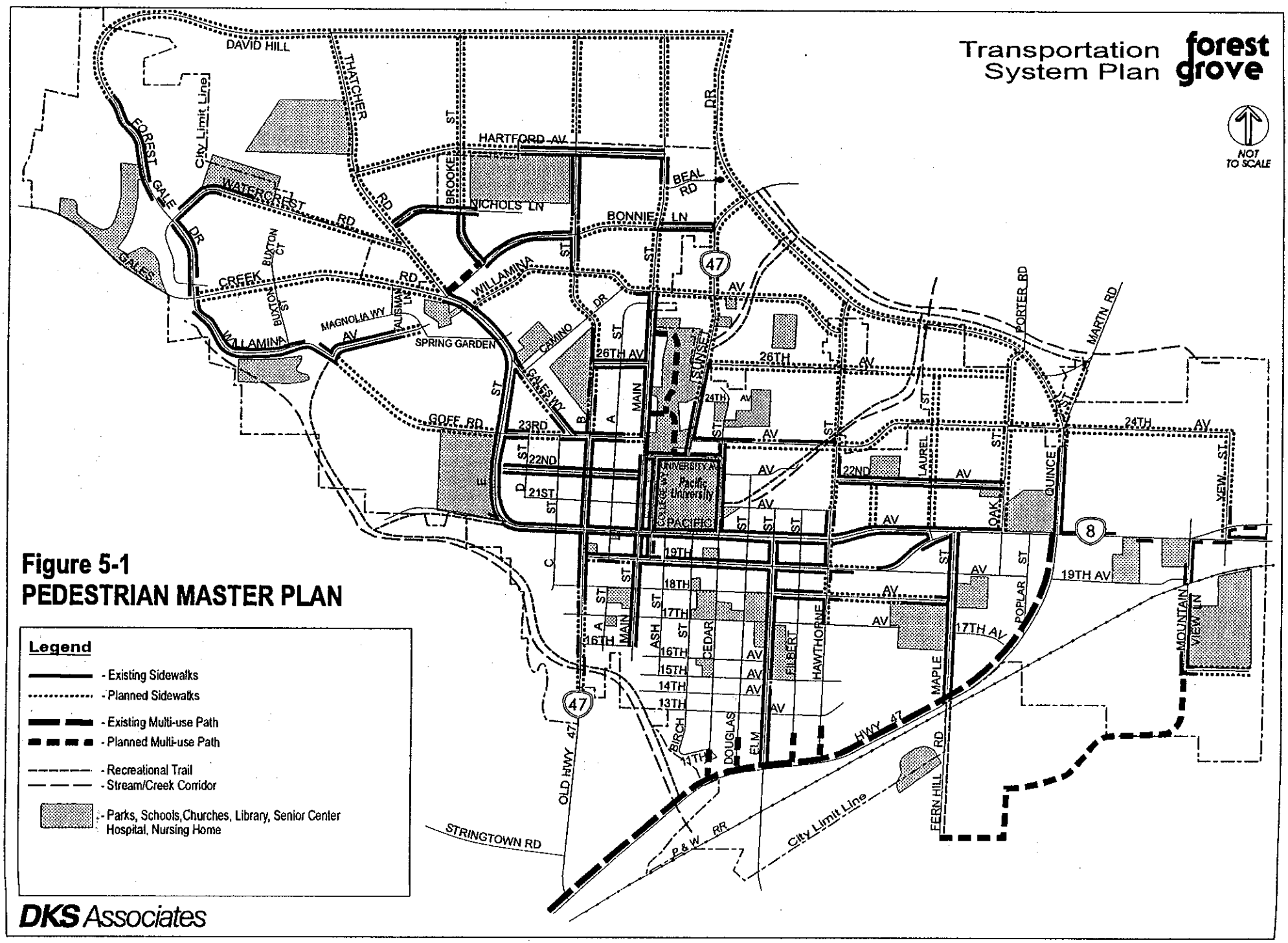

Figure 5-1
PEDESTRIAN MASTER PLAN

Legend

- Existing Sidewalks
- Planned Sidewalks
- Existing Multi-use Path
- Planned Multi-use Path
- Recreational Trail
- Stream/Creek Corridor
- Parks, Schools, Churches, Library, Senior Center Hospital, Nursing Home

DKS Associates

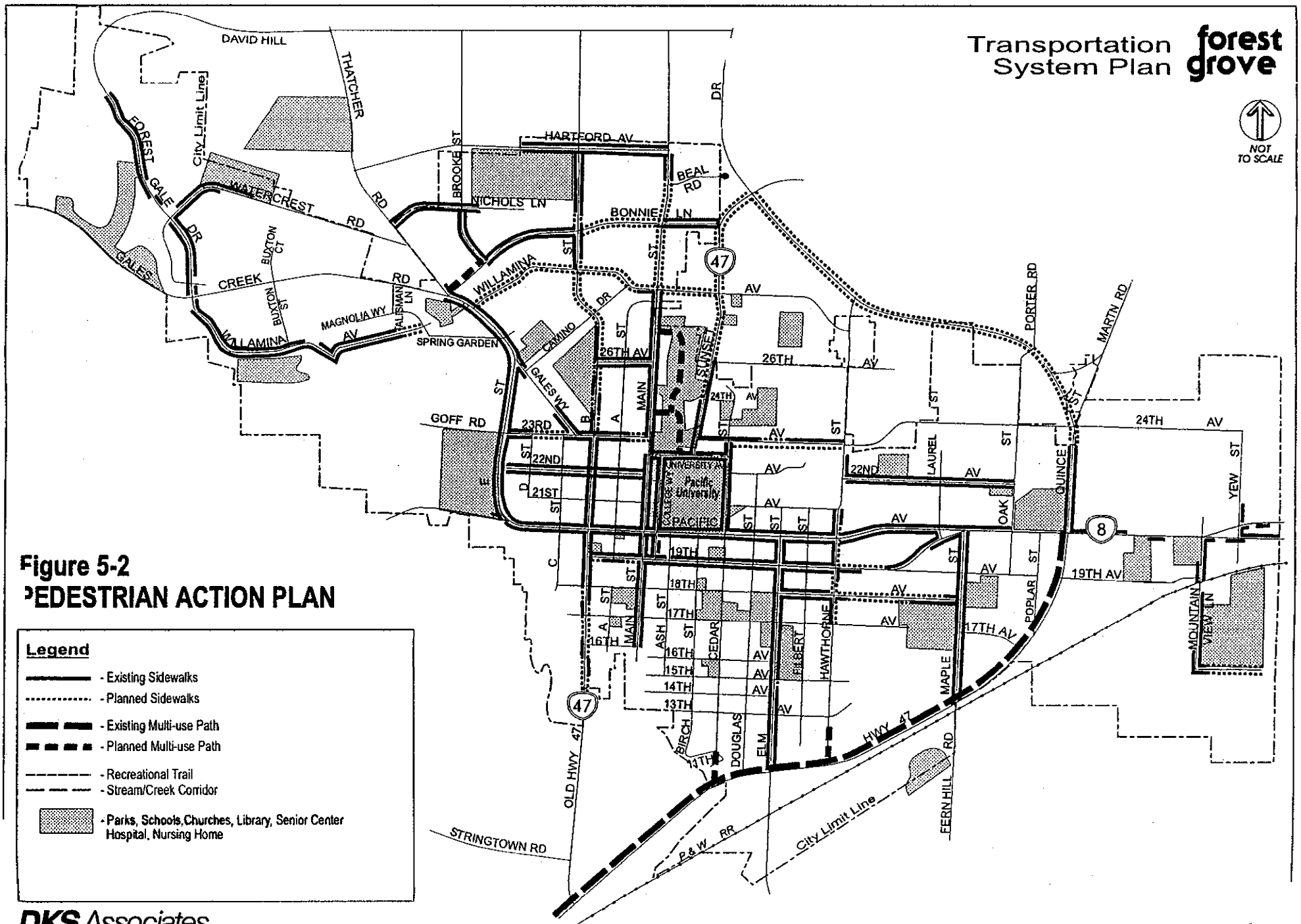

Figure 5-2
PEDESTRIAN ACTION PLAN

Legend

- Existing Sidewalks
- Planned Sidewalks
- Existing Multi-use Path
- Planned Multi-use Path
- Recreational Trail
- Stream/Creek Corridor
- Parks, Schools, Churches, Library, Senior Center Hospital, Nursing Home

DKS Associates

Chapter 6: Bicycles

This chapter summarizes existing and future facility needs for bicycles in the City of Forest Grove. The following sections outline the criteria to be used to evaluate needs, provide a number of strategies for implementing a bikeway plan and recommend a bikeway plan for the City of Forest Grove. The needs, criteria and strategies were identified in working with the City's Technical Advisory Committee. This committee provided input regarding the transportation system in Forest Grove, specifically exploring bicycle needs. The methodology used to develop the bicycle plan combined citizen and staff input, specific Transportation Planning Rule requirements[1] and continuity to the regional bicycle system.[2]

Metro's 1999 *Preliminary Draft Regional Transportation Plan (RTP)* has identified a Proposed Regional Bicycle Network. The Forest Grove streets classified in the RTP are summarized in the table below.

Table 1: Metro Bicycle System Designation

Facility	*Metro Regional Bicycle System Designation*
Gales Creek Road	Regional Corridor Bikeway
B Street (Nehalem Hwy)	Regional Corridor Bikeway
19th Avenue/Pacific Avenue	Regional Access Bikeway
Hwy. 47 Bypass	Regional Corridor Bikeway
Sunset Drive	Regional Corridor Bikeway
University Avenue	Regional Corridor Bikeway
College Way	Regional Corridor Bikeway

Source: Preliminary Draft RTP, Figure 1.13, June 17, 1999

Needs

Continuous bikeways are currently only provided on Gales Creek Road, E Street and along Highway 47 in the City of Forest Grove. In addition, there are a few segments where bikeways do exist where new development and roadway improvements have occurred. Continuity and connectivity are key issues for bicyclists and the lack of facilities cause significant problems for bicyclists in Forest Grove. Without connectivity of the bicycle system, this mode of travel is

1 *Transportation Planning Rule*, State of Oregon, DLCD, Section 660-12-020(2)(d), 660-12-035(3)(e), 660-12-095(3)(b & c).

2 *Regional Bicycle System Map, Draft 3.0*, Metro, July 2, 1997.

severely limited (similar to a road system full of cul-de-sacs). The TPR[3] calls for all arterial and collector streets to have bicycle facilities. To meet the TPR requirements and fill in existing gaps in the existing bicycle system, an action plan that focuses on a framework system should be developed to prioritize bicycle investment.

Bicycle trips are different from pedestrian and motor vehicle trips. Common bicycle trips are longer than walking trips and generally shorter than motor vehicle trips. Bicycle trips can generally fall into three groups: commuters, activity-based and recreational. Commuter trips are typically home/work/home (sometimes linking to transit) and are made on direct, major connecting roadways and/or local streets. Bicycle lanes provide good accommodations for these trips. Activity based trips can be home-to-school, home-to-park, home-to-neighborhood commercial or home-to-home. Many of these trips are made on local streets with some connections to the major functional classification streets. The needs are for lower volume/speed traffic streets, safety and connectivity. Recreational trips share many of the needs of both the commuter and activity-based trips, but create greater needs for off-street routes, connections to rural routes and safety. Bicycle facility needs fall into two primary categories: route facilities and parking facilities. Bicycle lanes are the most common route facilities in Hillsboro. Racks, lockers and shelters are typical bicycle parking facilities.

Facilities

Bicycle facilities can generally be categorized as bike lanes, bicycle accommodation, or off-street bike paths/multi-use trails. Bike lanes are areas within the street right-of-way designated specifically for bicycle use. Federal research has indicated that bike lanes are the most cost effective and safe facilities for bicyclists when considering all factors of design. Bicycle accommodations are where bicyclists and autos share the same travel lanes, including a wider outside lane and/or bicycle boulevard treatment (priority to through bikes on local streets). Multi-use paths are generally off-street routes (typically recreationally focused) that can be used by several transportation modes, including bicycles, pedestrians and other non-motorized modes (i.e. skateboards, roller blades, etc.). The term bikeway is used in this plan to represent any of the bicycle accommodations described above. The bicycle plan designates where bike lanes and multi-use paths are anticipated and any other bicycle ways are expected to be bike accommodations.

Bicycle lanes adjacent to the curb are preferred to bicycle lanes adjacent to parked cars. Six foot bicycle lanes are recommended. Design features in the roadway can improve bicycle safety[4]. For example, using curb storm drain inlets rather than catch basins significantly improves bicycle facilities. On reconstruction projects, bicycle lanes of five feet may need to be considered. Bicycle accommodations can be provided by widening the curb travel lane (for example, from 12 feet to 14 or 15 feet). This extra width makes bicycle travel more accommodating and provides a greater measure of safety. Signing and marking of bicycle lanes should follow the *Manual on Uniform Traffic Control Devices*, as adopted for Oregon.

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[3] Oregon Administrative Rultes, Chapter 660, Division 12, Section 045(3).

[4] Oregon Bicycle and Pedestrian Plan, ODOT, June, 1995; this provides an in-depth discussion on bicycle network development.

Criteria

Forest Grove's Technical Advisory Committee created a set of goals and policies to guide transportation system development in Forest Grove (see Chapter 2). Several of these policies pertain specifically to bicycle needs as summarized in Table 6-2 below.

Table 6-2: Bicycle Facility Goals and Policy Criteria

Goal	*Policy*	*Description*
Goal 2: Balanced Transportation System	Policy 3:	Bicycle lanes should be constructed on all arterials and collectors within Forest Grove (with construction or reconstruction projects). All schools, parks, public facilities and retail areas shall have direct access to a bikeway.
	Policy 5:	Bicycle and pedestrian plans shall be developed which link to recreational trails.
Goal 3: Safety	Policy 3:	Safe and secure pedestrian and bicycle ways shall be designed between parks and other activity centers in Forest Grove.

These goals and policies are the criteria that all bikeway improvements in Forest Grove should be measured against to determine if they conform to the intended direction of the City.

Policy 2-3 sets a specific requirement that bicycle lanes be constructed on all arterials and collectors within Forest Grove and that all schools, parks, public facilities and retail areas have direct access to a bicycle lane or route. Table 6-3 summarizes the bicycle corridors created by overlaying the bicycle network over the arterial and collector system in Forest Grove.

Since bicyclists can generally travel further than pedestrians, connections that lead to regional destinations such as Hillsboro areas are important. Forest Grove's bicycle network should connect to Washington County's and Cornelius's bicycle networks and be consistent with the Regional Bicycle System. A key locations where connections should be made to these other jurisdictions' networks is Highway 8.

Table 6-3: Corridors in Proposed Bikeway Network

North-South Corridors	*East-West Corridors*
Sunset Drive	Pacific Avenue
College Way	19th Avenue
B Street (Nehalem Highway)	TV Highway
	Gales Creek Road

Strategies

Several strategies were considered for construction of future bikeway facilities in Forest Grove. These strategies were studied to provide the City with priorities since it is likely that the available funding will be insufficient to address all of the projects identified in the Bikeway Master Plan.

Strategy 1 - "Fill in Gaps in the Network where Some Bikeways Exist"

This strategy provides bikeways which fill in the gaps between existing bikeways where a significant portion of a bikeway corridor already exists. This strategy maximizes the use of existing bicycle facilities to create complete sections of an overall bikeway network.

Strategy 2 - "Bicycle Corridors that Commuters Might Use"

This strategy focuses on providing bicycle facilities where commuters are likely to go such as local (within Forest Grove) or regional (i.e. Cornelius, Hillsboro) employment centers or leading to transit which provides access to regional employment centers.

Strategy 3 – "Bicycle Corridors that Access Commercial Areas"

This strategy puts priority on bicycle lanes for arterials/collectors which provide access to commercial areas within the City.

Strategy 4 - "Connect Key Bicycle Corridors to Schools, Parks, Recreational Facilities and Activity Centers"

This strategy provides bikeway links to schools, parks, recreational facilities and activity centers from the arterial/collector bikeway network. This alternative provides added safety to likely bicyclist destinations as well as destinations where children are likely to travel.

Strategy 5 - "Bicycle Corridors that Connect Neighborhoods"

This alternative puts priority on bicycle lanes for routes which link neighborhoods together. Some of these could include paths crossing parks, schools or utility rights-of-way.

Strategy 6 – "Construct All Bikeways to City of Forest Grove/Washington County Standards"

This strategy focuses on upgrading any substandard existing bikeways to current city standards. Current standards are for six foot wide bike lanes with appropriate striping and signs for bicycle safety.

Strategy 7 – "Bicycle Corridors that Connect to Major Recreational Facilities"

This strategy provides a connection between the bikeway network and major recreational facilities.

Table 6-4 summarizes the strategies in terms of meeting the transportation goals and objectives.

Table 6-4: Bikeway Facility Strategies Comparisons

	Strategy	Policies		
		2-3	2-5	3-3
1.	Connect key bicycle corridors to schools, parks, recreational facilities & activity centers	★★★	★★★	★★★
2.	Connect bicycle corridors to major recreational facilities	★★	★★★	★★★
3.	Bicycle corridors that connect neighborhoods	★★	★	★★
4.	Fill in gaps in the network where some bikeways exist	★★	★	★★
5.	Construct existing bikeways to Forest Grove and Washington County standards	★	★	★
6.	Connect bicycle corridors to commercial areas	★★★	★	★
7.	Bicycle corridors that commuters might use	★★★	★	★★

○	Does not meet criteria
★	Partially meets criteria
★★	Mostly meets criteria
★★★	Fully meets criteria

Recommended Bikeway Facility Plan

The strategies that had been evaluated by the Technical Advisory Committee were ranked by the committee. Each task force member was assigned a certain number of points that he or shoe could allocate to each of the strategies according to his or her vision of priorities for the City of Forest Grove. The ranking of these strategies follows, from most important to least important:

- Connect key bicycle corridors to schools, parks, recreational facilities and activity centers (public facilities, etc.)
- Connect bicycle corridors to major recreational facilities
- Bicycle corridors that connect neighborhoods
- Fill in gaps in the network where some bikeways exist
- Construct existing bikeways to Forest Grove/Washington County standards
- Connect bicycle corridors to commercial areas
- Bicycle corridors for commuters

A list of likely actions to achieve fulfillment of these priorities was developed into a Bicycle Master Plan. The Bicycle Master Plan (Figure 6-1) is an overall plan and summarizes the "wish list" of bicycle-related projects in Forest Grove, providing a long-term map for planning bicycle facilities. From this Master Plan, a more specific, shorter term, Action Plan was developed. The Action Plan (Figure 6-2) consists of projects that the City should actively try to fund. These projects form a basic bicycle grid system for Forest Grove. As development occurs, streets are rebuilt and other opportunities (such as grant programs) arise, projects on the Master Plan should be pursued as well.

Potential Project List

Table 6-5 outlines potential bicycle projects in Forest Grove. The City, through its Capital Improvement Program (CIP), joint funding with other agencies (Washington County, Metro) and development approval would implement these projects. Figure 6-2 summarizes the Bicycle Action Plan.

Multi-use paths identified on the bicycle plans should be aligned to cross roadways at intersections for safe crossing rather than crossing roadways at mid-blocks without traffic control.

Table 6-5: Potential Bicycle Projects

*Rank**	*Location*	*From*	*To*
Action Plan Projects			
H-1	19th Avenue	B Street	Ballad Town Shops
H-2	Pacific Avenue	E Street	Hawthorne Street
H-3	Sunset Drive	University Avenue	Hwy. 47 Bypass
H-4	College Way	Pacific Avenue	University Avenue
H-5	Hwy. 47 North Bypass	TV Highway	North city limit
Master Plan Projects			
M-1	Thatcher Road	Gales Creek Road	North city limit
M-2	B Street (Nehalem Hwy.)	Pacific Avenue	South city limit
M-3	TV Highway	Mtn. View Lane	Quince Street
L-1	Pacific Avenue(Ritchey Road)	E Street	West city limit

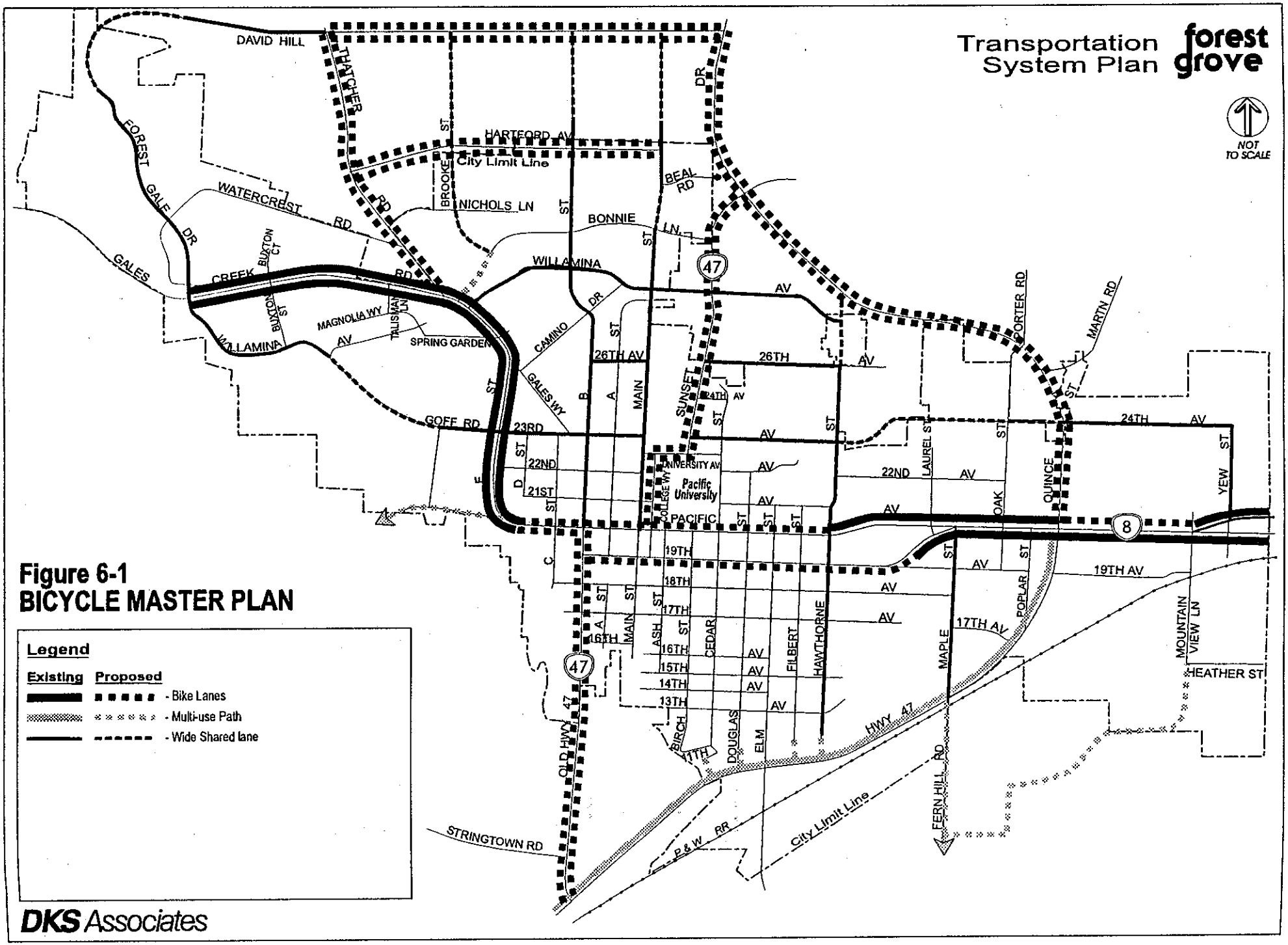
Note: H=High, M=Medium, L=Low Priority

Complementing Land Development Actions

The Transportation Planning Rule requires that bicycle parking facilities be provided as part of new residential developments of four units or more, new retail, office and institutional developments, and all transit transfer stations and park and ride lots.[5]

It is important that, as new development occurs, connections or accessways are provided to link the development to the existing bicycle and pedestrian facilities in as direct manner as is reasonable. If a development fronts a proposed bikeway or sidewalk (as shown in the Bicycle or Pedestrian Master Plans), the developer shall be responsible for providing the bikeway or walkway facility as part of any half-street improvement required for project mitigation.

5 *Transportation Planning Rule*, State of Oregon, Department of Land Conservation and Development, Section 660-12-045(3)(a).


Transportation System Plan
forest grove
NOT TO SCALE
DAVID HILL
THATCHER RD
FOREST GALE DR
WATERCREST RD
GALES CREEK
BUXTON CT
BUXTON ST
MAGNOLIA WY
TALISMAN LN
WILLAMINA AV
SPRING GARDEN
HARTFORD AV
City Limit Line
BROOKE ST
NICHOLS LN
BONNIE LN
BEAL RD
CAMINO DR
GALES WY
GOFF RD
23RD AV
22ND AV
21ST AV
26TH AV
24TH AV
PACIFIC AV
UNIVERSITY AV
College Way
Pacific University
MAIN ST
A ST
B ST
C ST
D ST
E ST
SUNSET ST
LAUREL ST
OAK ST
QUINCE ST
YEW ST
PORTER RD
MARTIN RD
19TH AV
18TH AV
17TH AV
16TH AV
15TH AV
14TH AV
13TH AV
11TH AV
ASH ST
CEDAR ST
FILBERT ST
HAWTHORNE ST
MAPLE ST
POPLAR ST
BIRCH ST
DOUGLAS ST
ELM ST
MOUNTAIN VIEW LN
HEATHER ST
FERN HILL RD
OLD HWY 47
HWY 47
STRINGTOWN RD
P & W RR
City Limit Line
47
8
Figure 6-1
BICYCLE MASTER PLAN
Legend
Existing
Proposed
- Bike Lanes
- Multi-use Path
- Wide Shared lane
DKS Associates

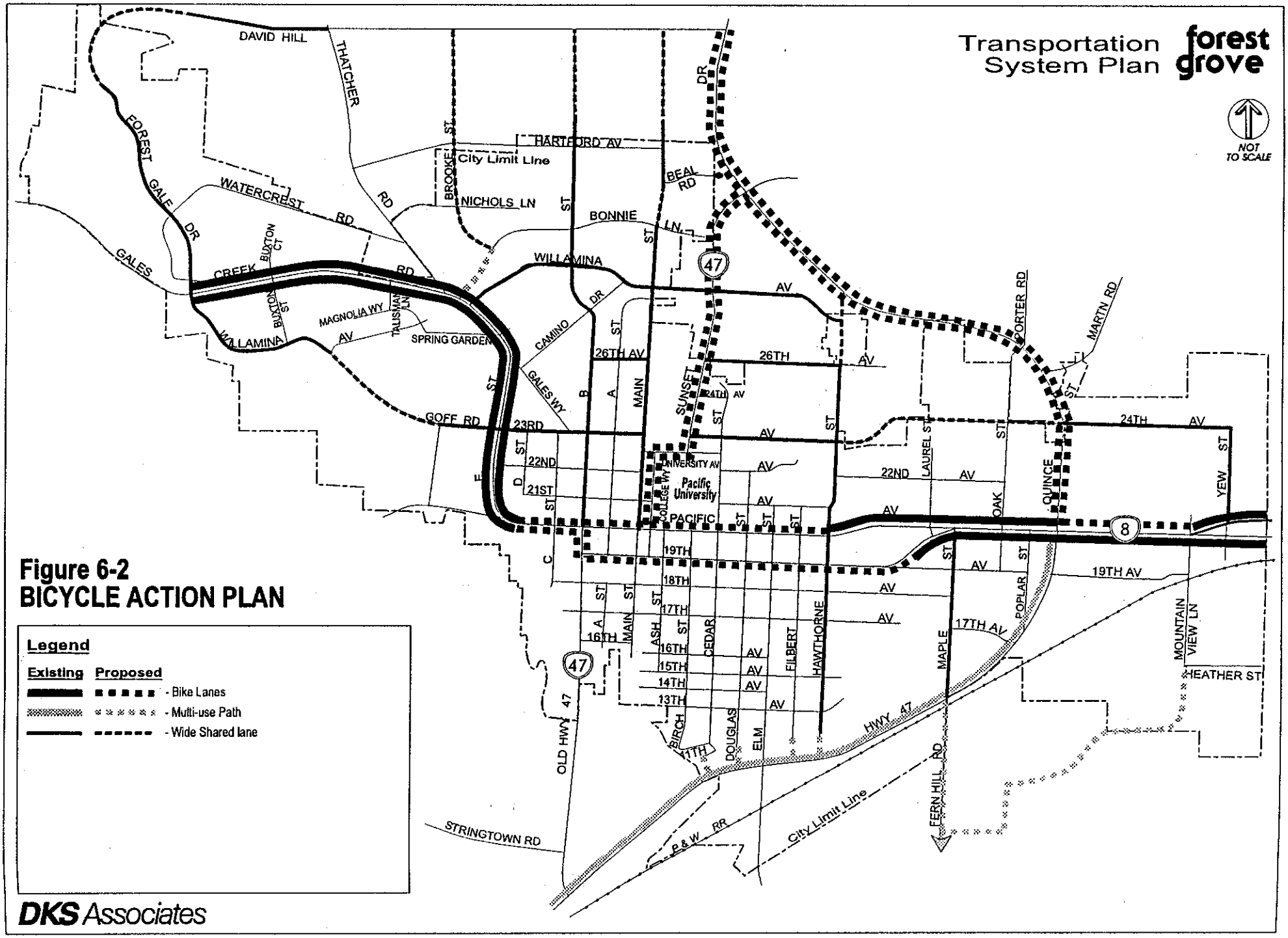


Figure 6-2
BICYCLE ACTION PLAN

Legend

Existing	Proposed	
▬▬	▪▪▪▪	- Bike Lanes
▒▒▒	⁘⁘⁘⁘	- Multi-use Path
———	------	- Wide Shared lane

DKS Associates

Chapter 7: Transit

This chapter summarizes existing and future transit needs in the City of Forest Grove. The following sections outline the criteria to be used to evaluate needs, provides a number of strategies for implementing a transit plan and recommends a transit plan for the City of Forest Grove. The needs, criteria and strategies were identified in working with the City's Technical Advisory Committee. This committee provided input regarding the transportation system in Forest Grove, specifically exploring transit needs. The methodology used to develop the transit plan combined citizen and staff input.

Needs

Transit service is provided to Forest Grove by the Tri-County Metropolitan Transportation District of Oregon (Tri-Met). There is one fixed route Tri-Met bus route which directly serves Forest Grove: 57 TV Highway-Forest Grove bus route. Figure 3-8 shows the bus route and bus stops within Forest Grove. Bus Route 57 provides service between the Beaverton Transit Center and Forest Grove via Canyon Road and Tualatin Valley Highway. The route operates with approximately 30-minute headways in the peak commute periods. On an average weekday, the route experiences approximately 750 rider boardings.

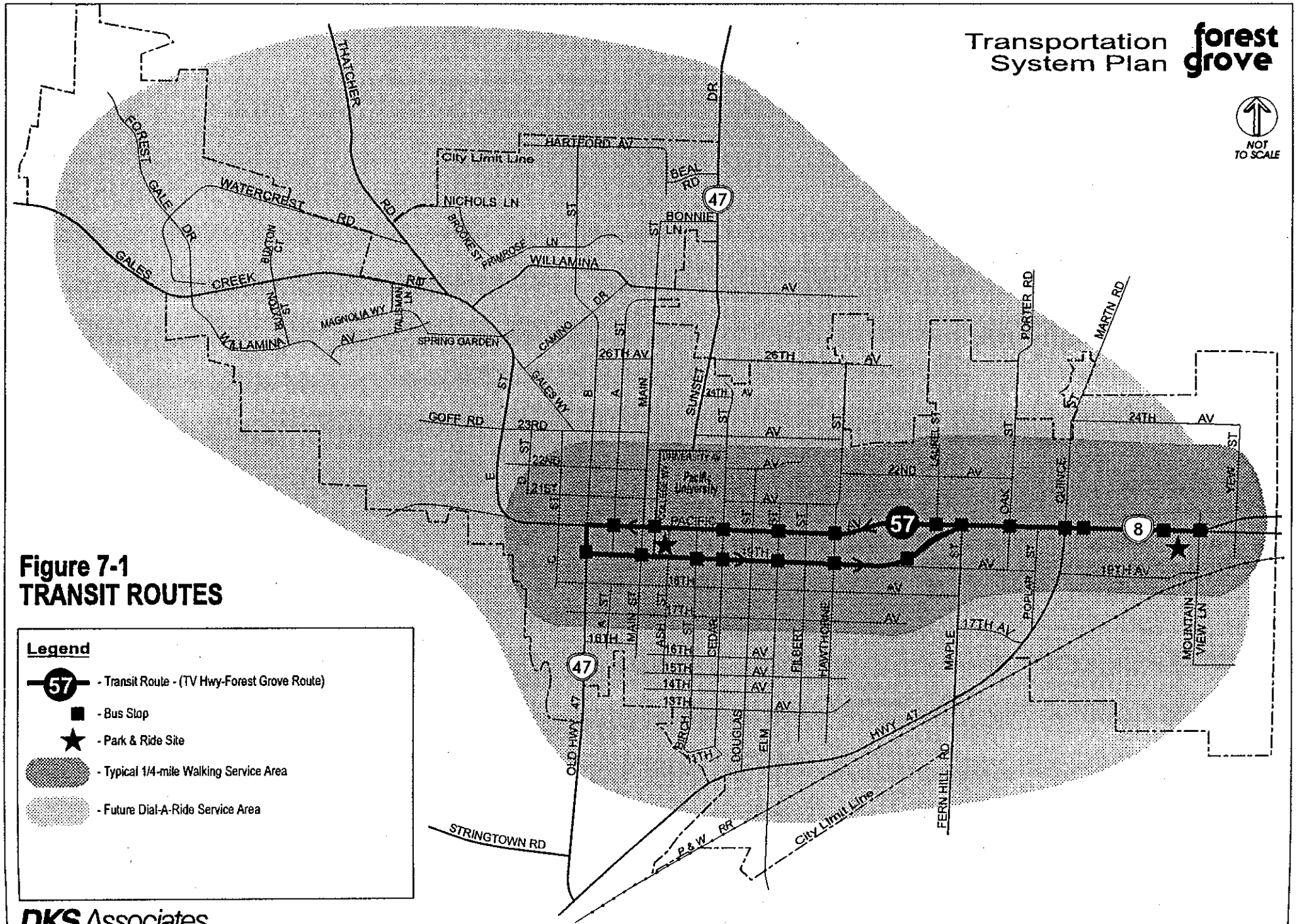
Metro's Draft Regional Transportation Plan (RTP) the TV Highway as part of the *primary bus network*[1]. Primary routes provide the backbone of the transit system and are intended to provide high quality service operating at frequencies of 15 minutes all day.

One of Forest Grove's greatest transit needs in the future will be improving transit service to the northwest sector of the city.

Criteria

Forest Grove's Technical Advisory Committee created a set of goals and policies to guide transportation system development in Forest Grove (see Chapter 2). These goals and policies represent the criteria that all transit improvements in Forest Grove should be compared against to determine if they conform to the intended vision of the City. A few of these policies pertain specifically to transit needs as summarized in Table 7-1.

1 *Public Transportation System Map*, Metro, Draft 2.1, March 18, 1997.


Transportation System Plan
forest grove
NOT TO SCALE
Figure 7-1
TRANSIT ROUTES
Legend
57 - Transit Route - (TV Hwy-Forest Grove Route)
- Bus Stop
- Park & Ride Site
- Typical 1/4-mile Walking Service Area
- Future Dial-A-Ride Service Area
DKS Associates
THATCHER RD
FOREST GALE DR
WATERCREST RD
GALES CREEK
BURTON CT
BURTON ST
WILLAMINA AV
MAGNOLIA WY
TALMAN LN
SPRING GARDEN
CAMINO DR
CALES WY
HARTFORD AV
City Limit Line
NICHOLS LN
BRODIAEA PRIMROSE LN
BEAL RD
BONNIE LN
WILLAMINA AV
GOFF RD
23RD
22ND
21ST
26TH AV
24TH AV
22ND AV
21ST AV
20TH AV
19TH AV
18TH AV
17TH AV
16TH
15TH
14TH
13TH
11TH
PACIFIC
MAIN ST
A ST
B ST
C ST
D ST
E ST
SUNSET
LAUREL ST
PORTER RD
MARTIN RD
QUINCE
OAK
POPLAR
MAPLE
CEDAR
ASH
BIRCH
DOUGLAS
ELM
FILBERT
HAWTHORNE
MOUNTAIN VIEW LN
YEW
PacificUniversity
OLD HWY 47
HWY 47
HWY 47
HWY 8
FERN HILL RD
STRINGTOWN RD
P & W RR
City Limit Line

Chapter 8: Motor Vehicles

This chapter summarizes needs for the motor vehicle system for both existing and future conditions in the City of Forest Grove. This chapter also outlines the criteria to be used in evaluating needs and recommends plans for motor vehicles (automobiles, trucks, buses and other vehicles). The needs and criteria were identified in working with the City's TSP Citizen's Advisory Committee. This group explored automobile and truck needs in the City of Forest Grove and provided input about how they would like to see the transportation system in their city develop. The Motor Vehicle modal plan is intended to be consistent with other jurisdictional plans including Metro's *Draft Regional Transportation Plan (RTP)*, Washington County's *Transportation Plan*, and ODOT's *Oregon Transportation Plan* (OTP).

The motor vehicle element of the TSP involves several elements as shown in Figure 8-1. This chapter is separated into the following sections:

- Criteria
- Functional Classification
- Circulation and Capacity Needs
- Alternatives
- Safety
- Maintenance
- Neighborhood Traffic Management
- Parking
- Access Management
- Transportation System Management/Intelligent Transportation Systems
- Truck Routes

Criteria

Forest Grove's TSP Technical Advisory Committee created a set of goals and policies to guide transportation system development in Forest Grove (see Chapter 2). Many of these goals and policies pertain specifically to motor vehicles. These goals and policies represent the criteria that all motor vehicle improvements or changes in Forest Grove should be measured against to determine if they conform to the intended direction of the City.

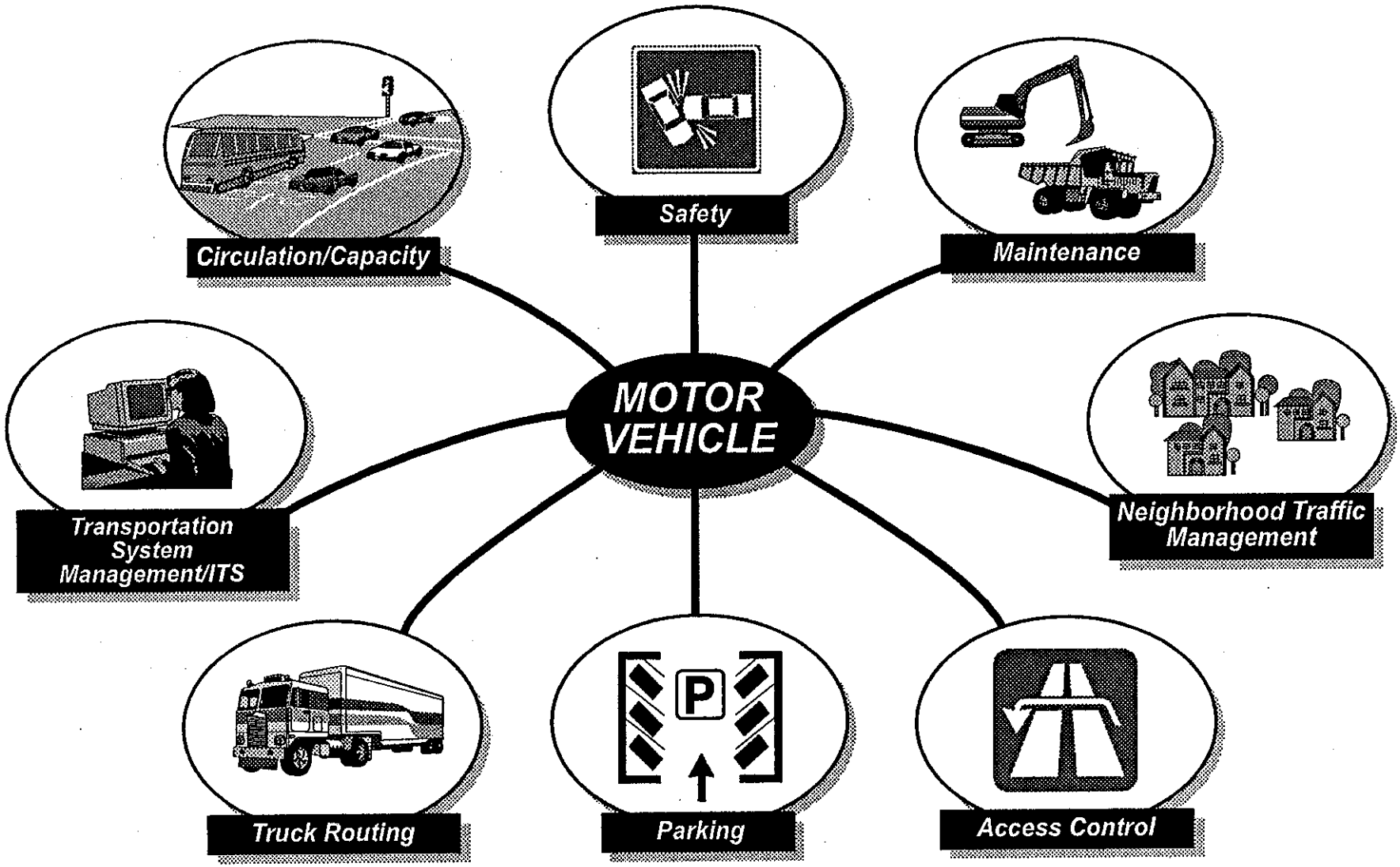


Figure 8-1
VEHICULAR ELEMENTS OF THE STREET PLAN

Goal 1: Livability

Policy 1. Maintain the livability of Forest Grove through proper location and design of transportation facilities.

Policy 3. Protect neighborhoods from excessive through traffic and travel speeds while providing reasonable access to and from residential areas. Build local and neighborhood streets to minimize speeding.

Policy 4. Relate the design of street capacity and improvements to their intended use.

Goal 2: Balanced Transportation System

Policy 1. Develop and implement public street standards that recognize the multi-purpose nature of the street right-of-way for utility, pedestrian, bicycle, transit, truck and auto use.

Policy 6. Local streets shall be designed to encourage a reduction in trip length by providing connectivity and limiting out-of-direction travel. Provide connectivity to activity centers and destinations with a priority for bicycle and pedestrian connections

Policy 7. Forest Grove will participate in vehicle trip reduction strategies developed regionally.

Goal 3: Safety

Policy 1. Design of streets should relate to their intended use.

Policy 2. Street maintenance shall be a priority to improve safety in Forest Grove.

Policy 5. Access management standards shall be developed in conjunction with the functional classification system for Forest Grove to improve safety in Forest Grove.

Policy 6. Establish a City monitoring system that regularly evaluates, prioritizes and mitigates high accident locations within the City.

Policy 7. Improve traffic safety through a comprehensive program of engineering, education and enforcement.

Goal 4: Performance Measures

Policy 1. A minimum intersection level of service standard shall be set for the City of Forest Grove. All public facilities shall be designed to meet this standard.

Policy 3. Work with Washington County, Metro, and ODOT to develop, operate and maintain intelligent transportation systems, including coordination of traffic signals.

Goal 5: Accessibility

Policy 2. Develop neighborhood and local connections to provide adequate circulation in and out of the neighborhoods.

Policy 3. Work with Washington County to develop an efficient arterial grid system that provides access within the City and serves through City traffic.

Goal 6: Goods Movement

Policy 1. Design arterial routes, highway access and adjacent land uses in ways that facilitate the efficient movement of goods and services.

Functional Classification

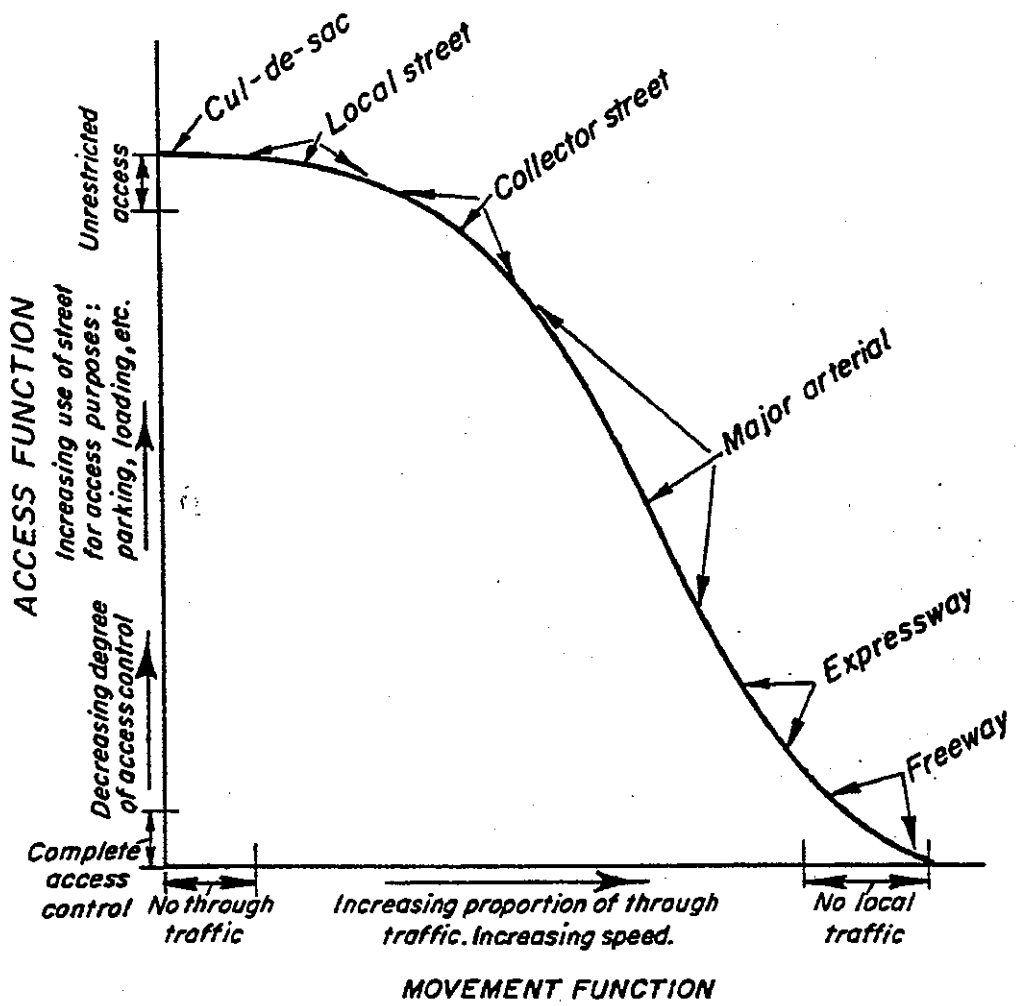
Roadways have two functions, to provide mobility and to provide access. From a design perspective, these functions can be incompatible since high or continuous speeds are desirable for mobility, while low speeds are more desirable for land access. Arterial facilities emphasize a high level of mobility for through movement; local facilities emphasize the land access function; and collectors offer a balance of both functions (Figure 8-2).

Functional classification has commonly been mistaken as a determinate for traffic volume, road size, urban design, land use and various other features which collectively are the elements of a roadway, but not its function. For example, the traffic on a roadway can be more directly related to land uses and because a roadway carries a lot or a little traffic does not necessarily determine its function. The traffic volume, design (including access standards) and size of the roadway are outcomes of function, but do not define function.

Function can be best defined by connectivity. Without connectivity, neither mobility nor access can be served. Roadways that provide the greatest reach of connectivity are the highest level facilities. Arterials can be defined by regional level connectivity. These routes go beyond the city limits in providing connectivity and can be defined into two groups: principal arterials (typically state routes) and arterials. The movement of persons, goods and services depends on an efficient arterial system. Collectors can be defined by citywide or district wide connectivity. These routes span large areas of the city but typically do not extend significantly into adjacent jurisdictions. They are important to city circulation. The past textbooks on functional classification then define all other routes as local streets, providing the highest level of access to adjoining land uses. These routes do not connect at any significant regional, city wide or district level.

Recent work in the area of neighborhoods and their specific street needs provides a fourth level of functional classification - neighborhood route. In many past plans, agencies defined a minor collector or a neighborhood collector; however, use of the term collector is not appropriate. Collectors provide citywide or large district connectivity and circulation. There is a level between collector and local streets that is unique due to its level of connectivity. Local streets can be cul-de-sacs or short streets that do not connect to anything.[1] neighborhood routes are commonly used by residents to circulate into or out of their neighborhood. They have connections within the neighborhood and between neighborhoods. These routes have neighborhood connectivity, but do not serve as citywide streets. They have been the most sensitive routes to through, speeding traffic due to their residential frontages. Because they do provide some level of connectivity, they can commonly be used as cut-through routes in lieu of congested or less direct arterial or collector streets which are not performing adequately. Cut-through traffic has the highest propensity to speed, creating negative impacts on these neighborhood routes. By designating these routes, a more systematic citywide program of neighborhood traffic management can be undertaken to protect these sensitive routes.

[1] Or in the case of neo-traditional grid systems, extensive redundancy in facilities results in local status to streets that have greater than local connectivity.



Source: University of California, 'Fundamentals of Traffic Engineering' Wolfgang S. Homburger and James H. Kell

Figure 8-2
STREET FUNCTION RELATIONSHIP

In the past, traffic volume and roadway size were linked to functional classification. More recently, urban design and land use have also been tied to functional classification. Discussions of neo-traditional street grids that eliminate the need for functional classification adds another commentary. This tends to become confusing, complicating an essential transportation planning exercise. The planning effort to identify connectivity of routes in Forest Grove is essential to preserve and protect future mobility and access, by all modes of travel. In Forest Grove, it is not possible to have a citywide neo-traditional layout. Past land use decisions, topography and environmental features preclude this[2]. Without defining the varying levels of connectivity now in the TSP, the future impact of the adopted Comprehensive Plan land uses will result in a degraded ability to move goods and people (existing and new) in Forest Grove. The outcome would be intolerable delays and much greater costs to address solutions later rather than sooner. By planning an effective functional classification of Forest Grove streets[3], the City can manage public facilities pragmatically and cost effectively.

These classifications do not mean that because a route is an arterial it is large and has lots of traffic. Nor do the definitions dictate that a local street should only be small with little traffic. Identification of connectivity does not dictate land use or demand for facilities. The demand for streets is directly related to the land use. The highest level connected streets have the greatest potential for higher traffic volumes, but do not necessarily have to have high volumes as an outcome, depending upon land uses in the area. Typically, a significant reason for high traffic volumes on surface streets at any point can be related to the level of land use intensity within a mile or two. Many arterials with the highest level of connectivity have only 33 to 67 percent "through traffic". Without the connectivity provided by arterials and collectors, the impact of traffic intruding into neighborhoods and local streets goes up substantially.

If land use is a primary determinate of traffic volumes on streets, then how is it established? In Oregon, land use planning laws require the designation of land uses in the Comprehensive Plan. Forest Grove's Comprehensive Plan land uses have been designated for over two decades. These land use designations are very important not only to the City for planning purposes, but to the people that own land in Forest Grove. The adopted land uses in Forest Grove have been used in this study, working with the Metro regional forecasts for growth in the region for the next 20 years. A regional effort, coordinated by Metro and local agencies, has been undertaken to allocate the determined overall land use in the most beneficial manner for transportation. Without this allocation, greater transportation impacts would occur (wider and more roads than identified in this plan). As discussed in Chapter 10, if the outcome of this TSP is either too many streets or solutions that are viewed to be too expensive, it is possible to reconsider the core assumptions regarding Forest Grove's livability - its adopted land uses or its service standards related to congestion. The charge of this TSP (as mandated by State law) is to develop a set of multi-modal transportation improvements to support the Comprehensive Plan land uses. Key to this planning task is the functional classification of streets.

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[2] While subdivisions or areas of neo-traditional development exist and are possible (even desirable), on the whole, the concept cannot be generically applied to the city in lieu of functional classification.

[3] Including definition of which routes connect through Forest Grove, within Forest Grove and which routes serve neighborhoods and the local level in the city.

Functional Classification Definitions

The proposed functional classification of streets in Forest Grove is represented by Figure 8-3. Any street not designated as either an arterial, collector or neighborhood route is considered a local street.

Principal Arterials are typically freeways and state highways that provide the highest level of connectivity. These routes connect over the longest distance (sometimes miles long) and are less frequent than other arterials or collectors. These highways generally span several jurisdictions and many times have statewide importance (as defined in the ODOT Level of Importance categorization).[4]

Arterial streets serve to interconnect and support the principal arterial highway system. These streets link major commercial, residential, industrial and institutional areas. Arterial streets are typically spaced about one mile apart to assure accessibility and reduce the incidence of traffic using collectors or local streets in lieu of a well placed arterial street. Many of these routes connect to cities surrounding Forest Grove.

Collector streets provide both access and circulation within residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system.

Neighborhood Routes are usually long relative to local streets and provide connectivity to collectors or arterials. Because neighborhood routes have greater connectivity, they generally have more traffic than local streets and are used by residents in the area to get into and out of the neighborhood, but do not serve citywide/large area circulation. They are typically about a quarter to a half mile in total length. Traffic from cul-de-sacs and other local streets may drain onto neighborhood routes to gain access to collectors or arterials. Because traffic needs are greater than a local street, certain measures should be considered to retain the neighborhood character and livability of these routes. Neighborhood traffic management measures are often appropriate (including devices such as speed humps, traffic circles and other devices - refer to later section in this chapter). However, it should **not** be construed that neighborhood routes automatically get speed humps or any other measures. While these routes have special needs, neighborhood traffic management is only one means of retaining neighborhood character and vitality.

Local Streets have the sole function of providing access to immediate adjacent land. Service to "through traffic movement" on local streets is deliberately discouraged by design.

Functional Classification Changes

The proposed functional classification differs from the existing approved functional classification. Neighborhood routes were not defined in the existing functional classification. The proposed functional classification was developed following detailed review of Forest Grove's, Washington County's and Metro's current proposals for functional classification. Table 8-1 summarizes the major differences between the proposed functional classification and the existing designations for streets in Forest Grove. This table also outlines the streets which were previously designated collectors that are now identified as neighborhood routes.

[4] Oregon Highway Plan, ODOT, 1991, Appendix A.

The criteria used to assess connectivity have two components: the extent of connectivity (as defined above) and the frequency of the facility type. Maps can be used to determine regional, city/district and neighborhood connections. The frequency or need for facilities of certain classifications is not routine or easy to package into a single criterion. While planning textbooks call for arterial spacing of a mile, collector spacing of a quarter to a half mile, and neighborhood connections at an eighth to a sixteenth of a mile, this does not form the only basis for defining functional classification. Changes in land use, environmental issues or barriers, topographic constraints, and demand for facilities can change the frequency for routes of certain functional classifications. While spacing standards can be a guide, they must consider other features and potential long term uses in the area (some areas would not experience significant changes in demand, where others will). Linkages to regional centers and town centers are another consideration for addressing frequency of routes of a certain functional classification. Connectivity to these areas is important, whereas linkages that do not connect any of these centers could be classified as lower levels in the functional classification.

Table 8-1: Proposed Changes to Existing Roadway Classification

	Roadway Classification According to Jurisdiction			*Proposed*
Roadway	*Forest Grove*	*Wash County*	*Metro*	*New TSP*
Beal Road	Collector	Collector	Not Classified	Local
College Way	Arterial	Principal Route	Not Classified	Local
Council Street	Arterial	Principal Route	Not Classified	Local
David Hill Road	Outside city	Not Classified	Not Classified	Arterial
Laurel Street	Local	Not Classified	Not Classified	Collector
Sunset Drive	Arterial	Principal Route	Not Classified	Collector
University Avenue	Arterial	Principal Route	Not Classified	Collector

Table 8-2: Changes from Collector or Local designation to Neighborhood Route

Street Name	*Current Designation*
13th Avenue (East of Cedar Street)	Local
18th Avenue	Collector
Buxton Street	Local
Cedar Street (South of 19th Avenue)	Local
Heather Street	Collector
Magnolia Way (between Talisman Lane & Willamina Ave.)	Local
Mt. View Lane	Collector
Spring Garden Way	Local
Talisman Lane	Local
Willamina Avenue (East of Goff Road)	Collector

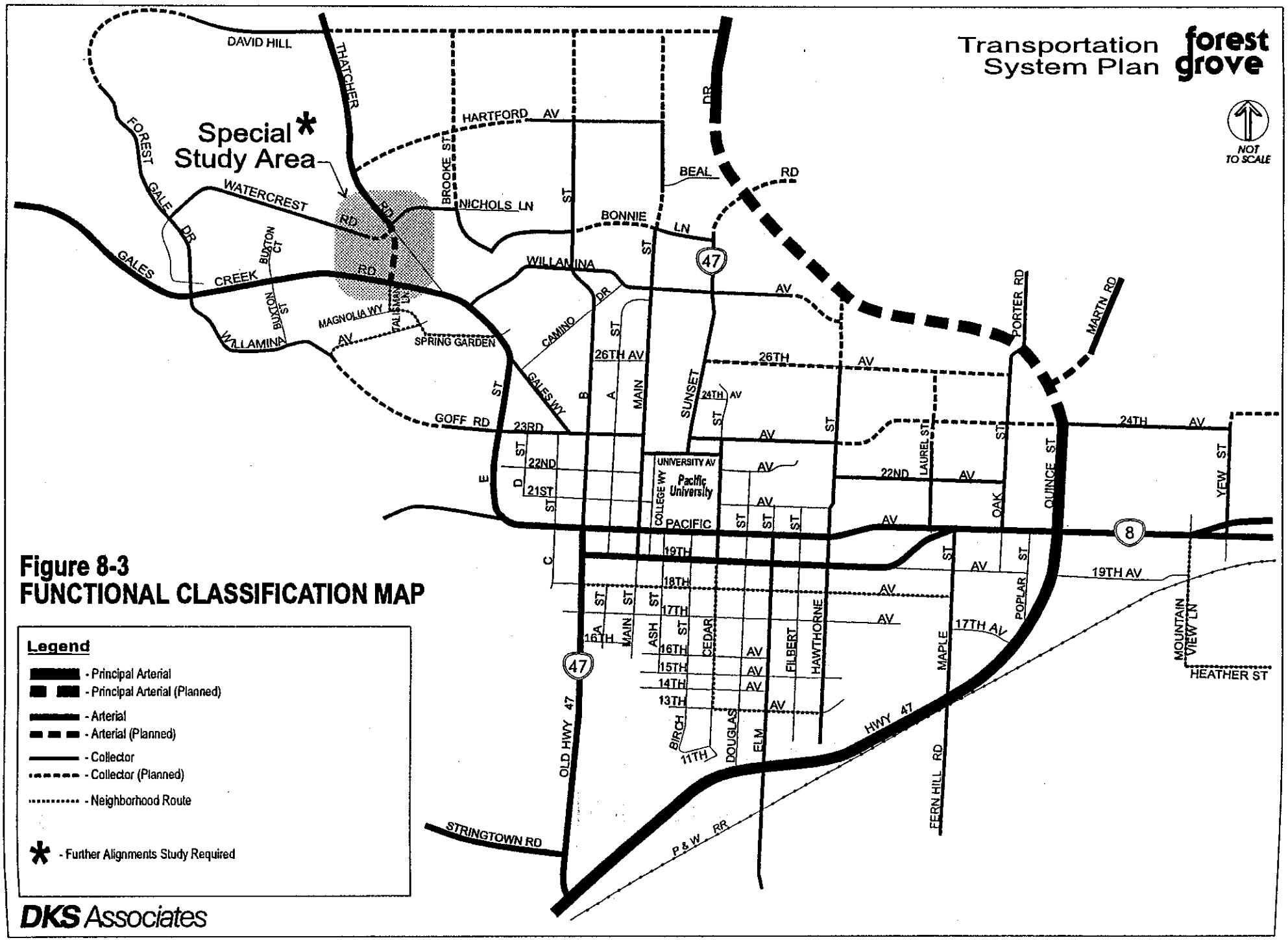


Figure 8-3
FUNCTIONAL CLASSIFICATION MAP

DKS Associates

Characteristics of Streets for each Functional Classification

The design characteristics of streets in Forest Grove were developed to meet the function and demand for each facility type. Because the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, the objective was to define a system that allows standardization of key characteristics to provide consistency, but also to provide criteria for application that provides some flexibility, while meeting standards. Figures 8-4 to 8-9 depict sample street cross-sections and design criteria for arterials, collectors, neighborhood routes and local streets. The major arterial street section indicates a range of sidewalk width. The actual width constructed would reflect right-of-way constraints and land use policies. Improvements to major arterials with a "boulevard" designation would include wider sidewalks than a major arterial with a "street" designation.

The analysis of capacity and circulation needs for Forest Grove outlines several roadway cross sections. The most common are 2, 3 and 5 lanes wide. Where center left turn lanes are identified (3 and 5 lane sections), the actual design of the street may include sections without center turn lanes (2 or 4 lane sections) or with median treatments, where feasible. The actual treatment will be determined within the design and public process for implementation of each project. The plan outlines requirements which will be used in establishing right-of-way needs for the development review process.

Wherever arterial or collectors cross each other, planning for additional right-of-way to accommodate turn lanes should be considered within 500 feet of the intersection. Figure 8-10 summarizes the Forest Grove streets which are anticipated within the TSP planning horizon to require right-of-way for more than two lanes. Planning level right-of-way needs can be determined utilizing Figure 8-10, Table 8-3 and the lane geometry outlined later in this chapter. Specific right-of-way needs will need to be monitored continuously through the development review process to reflect current needs and conditions (that is to say that more specific detail may become evident in development review which requires improvements other than these outlined in this 20 year general planning assessment of street needs).

These cross sections are provided for guiding discussions that will update the City of Forest Grove *Standard Specifications for Public Works Construction*. There is an on-going discussion at the regional level regarding street cross sections. Metro has specified Regional Street Design designations in their draft of the RTP[5]. These designations change over the length of the road. The City of Forest Grove will need to coordinate with regional agencies to assure consistency in cross section planning as the County Transportation Plan and the Metro Regional Transportation Plan move forward. The designations are summarized below in Table 8-3.

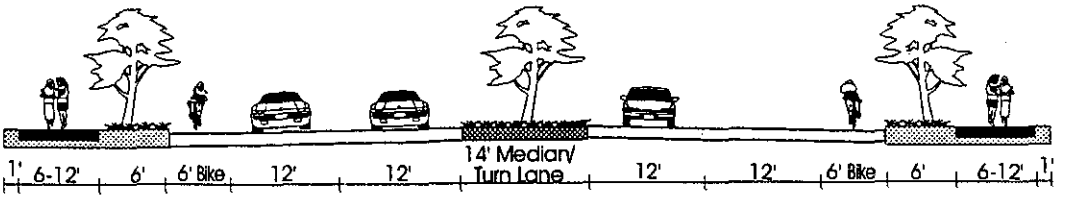
[5] Refer to Regional Street Design, RTP and 2040 planning for maps and descriptions, Metro, Draft 3.0, July 2, 1997. Adopted in Regional Framework Plan, Metro, Ordinance 96-647C, November 1996.

Table 8-3: Metro Regional Street Design Designations

Roadway	*Designation*
ORE 47	Highway
ORE 8 (TV Highway, east of ORE 47)	Regional Street
Pacific Avenue (ORE 47 to Cedar)	Community Street
19th Avenue (Cedar to ORE 47)	Community Street
Pacific Avenue (Cedar to B St.)	Community Boulevard
19th Avenue (B St. to Cedar)	Community Boulevard
"E" Street/Gales Creek Road	Community Street

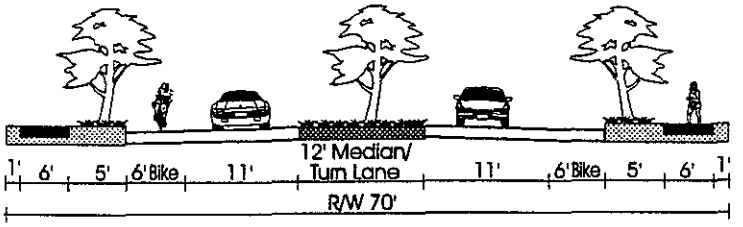
NOTE: Refer to Metro's RTP Policy Chapter for background on guidelines for streets, 1997.

Five-Lane/Major Arterial (TV Highway)



5 Lane 100'-112' R/W

Three Lane Arterial (David Hill Rd)



3 Lane 70' R/W

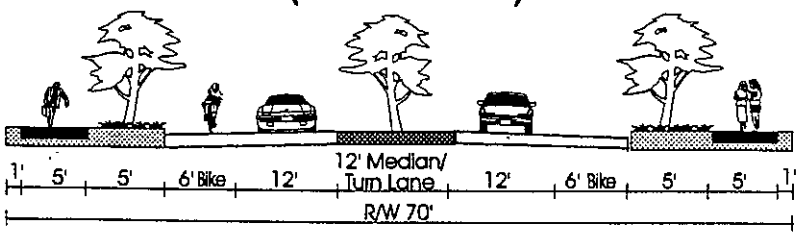
Criteria	5 Lane Arterial	3 Lane Arterial
Vehicle Lane Widths:	11-14 ft.	11-12 ft.
On Street Parking:	None	None
Bicycle Lanes:	5-6 ft.	5-6 ft.
Sidewalks:	6-12 ft.	5-8 ft.
Landscape Strips:	0-8 ft.	0-8 ft.
Medians/Turn Lane Widths:	12-14 ft.	12-14 ft.
Neighborhood Traffic Management:	Not Appropriate	Not Appropriate

Figure 8-4
ARTERIAL
SAMPLE STREET CROSS SECTIONS

Legend

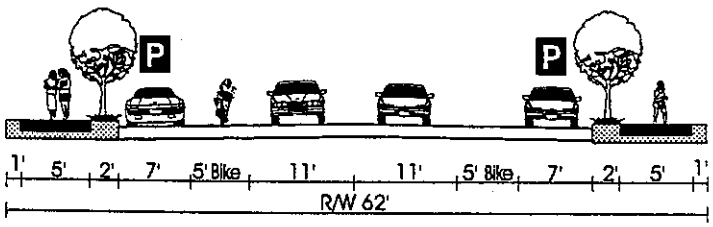
P - On-street Parking Lane

Three-Lane Collector (Sunset Drive)



3 Lane 60'-70' R/W

Neighborhood Route With Parking & Bike Lane



2 Lane 62' R/W

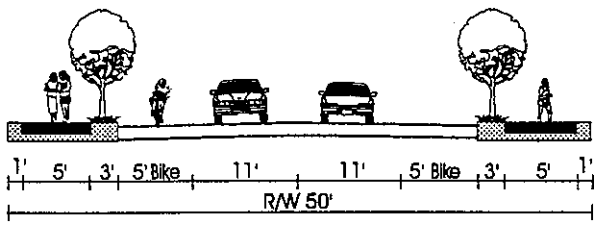
Criteria	Collector	Neighborhood Route
Vehicle Lane Widths:	10-12 ft.	11-12 ft.
On Street Parking:	5-8 ft.	7-8 ft.
Bicycle Lanes:	5-6 ft.	5 ft.
Sidewalks:	5-7 ft.	5-6 ft.
Landscape Strips:	0-8 ft.	0-5 ft.
Medians/Turn Lane Widths:	10-14 ft.	None
Neighborhood Traffic Management:	Under Special Conditions	Under Special Conditions

Figure 8-5
COLLECTOR
SAMPLE STREET CROSS SECTIONS

Legend

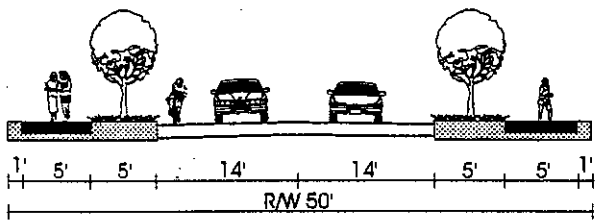
P - On-street Parking Lane

Neighborhood Route Without Parking



2 Lane 50' R/W

Neighborhood Collector Without Parking and Shared Bikeway



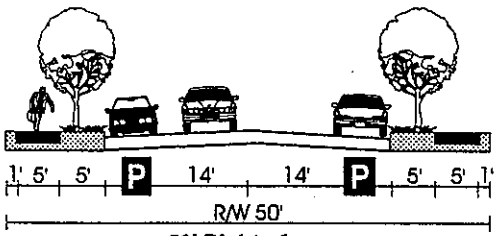
2 Lane 50' R/W

Figure 8-6
NEIGHBORHOOD ROUTE
SAMPLE STREET CROSS SECTIONS

Legend

P - *On-street Parking Lane*

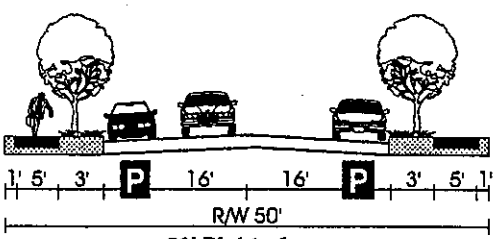
28' Standard Residential



50' Right-of-way

<1,000 vpd

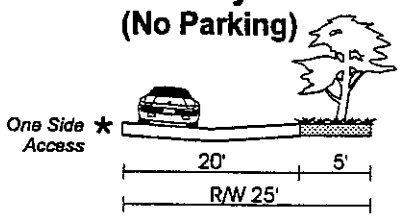
32' Standard Residential



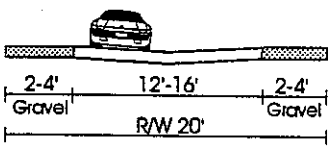
50' Right-of-way

<1,000 vpd

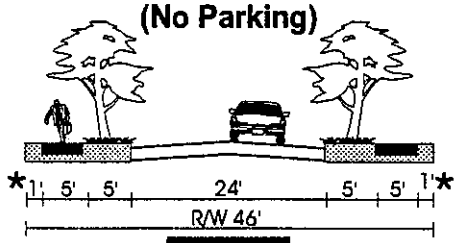
Alley (No Parking)



Alley (No Parking)



Cul-de-sac (No Parking)



<250 vpd

* - *Adjacent to private landscape*

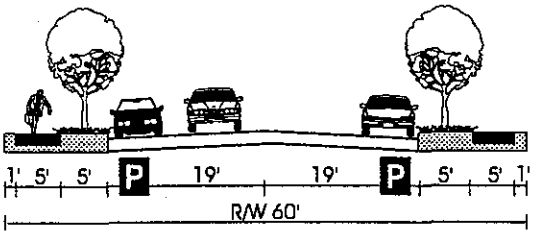
Figure 8-7
PROPOSED RESIDENTIAL LOCAL SAMPLE STREET CROSS SECTIONS

Legend

P - *On-street Parking Lane*

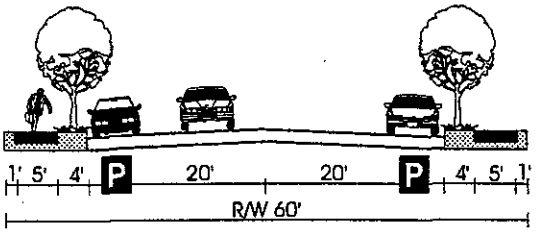
Note: If sidewalks are provided adjacent to curb without landscape strip the minimum sidewalk width shall be 6 feet for locals.

38' Standard Commercial



60' Right-of-way

40' Standard Industrial



60' Right-of-way

Figure 8-8
PROPOSED COMMERCIAL/INDUSTRIAL LOCAL SAMPLE STREET CROSS SECTIONS (60 Foot Right-of-way)

Legend

P - *On-street Parking Lane*

Note: If sidewalks are provided adjacent to curb without landscape strip, the minimum sidewalk width shall be 6 feet for locals.

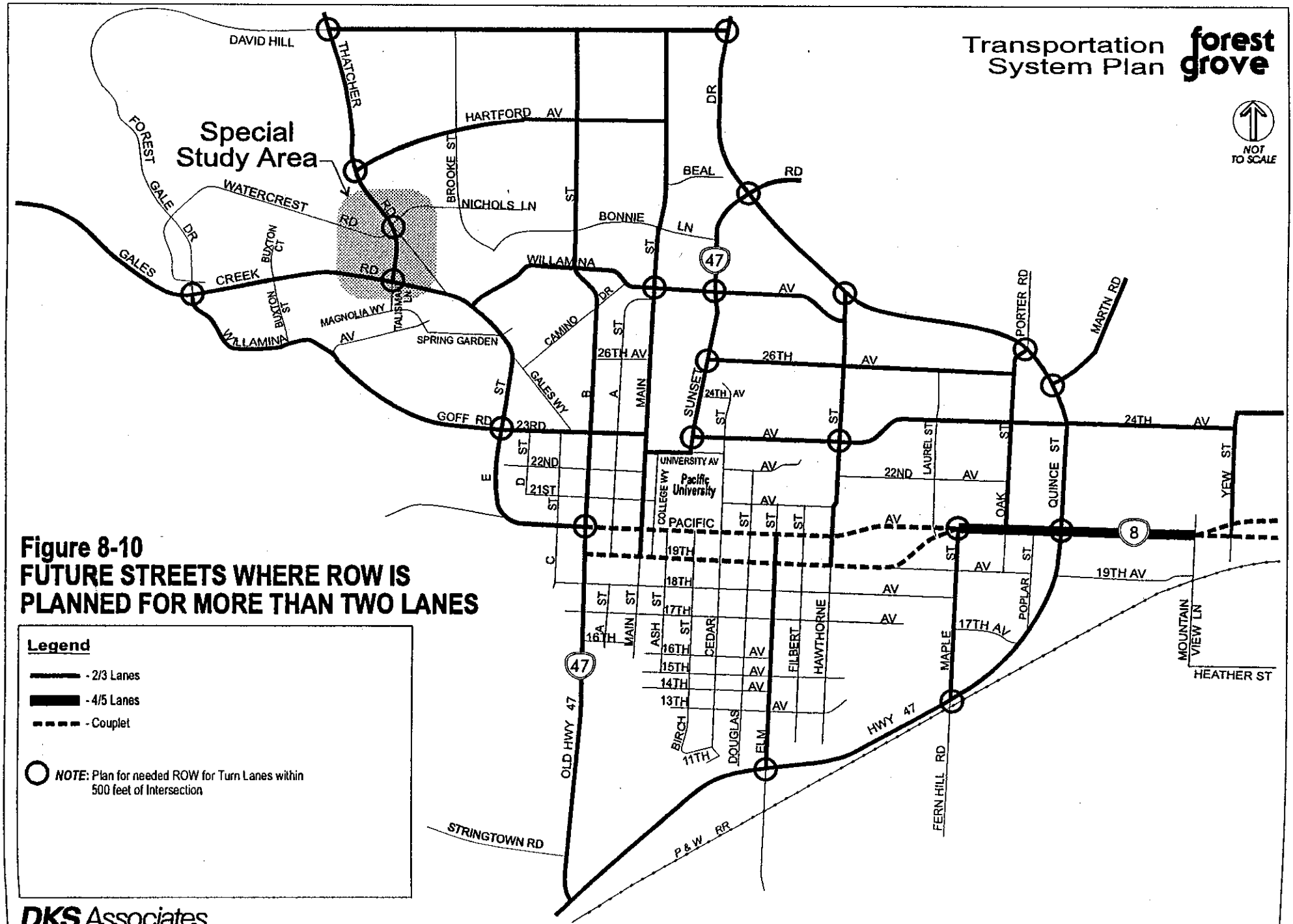


Figure 8-10
FUTURE STREETS WHERE ROW IS PLANNED FOR MORE THAN TWO LANES

Legend

- 2/3 Lanes
- 4/5 Lanes
- Couplet

○ ***NOTE***: Plan for needed ROW for Turn Lanes within 500 feet of Intersection

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Connectivity/Local Street Plan

Much of the local street network in Forest Grove is already existing and, in many cases, fairly well connected. In other words, multiple access opportunities exist for entering or exiting neighborhoods. A good example of this is the area in Forest Grove south of the couplet, where a "grid" street system is in place. However, there are a number of locations in Forest Grove where, due to the lack of connection points, the majority of neighborhood traffic is funneled onto one single street. This type of street network results in out-of-direction travel for motorists and an imbalance of traffic volumes that impacts residential frontage. By providing connectivity between neighborhoods, out-of-direction travel and vehicle miles traveled (VMT) can be reduced, accessibility between various modes can be enhanced and traffic levels can be balanced out between various streets. Several goals and policies established by this TSP are intended to accomplish these objectives.

In Forest Grove, some of these local connections can contribute with other street improvements to mitigate capacity deficiencies by better dispersing traffic. Several roadway connections will be needed within neighborhood areas to reduce out of direction travel for vehicles, pedestrians and bicyclists. This is most important in the areas north of the couplet both to the east, where there is a significant amount of undeveloped industrial land, and to the west, where there is a significant amount of residential development possible. South of the couplet, most of the land is built out in a grid network. Figures 8-11 and 8-12 show the proposed Local Street Connectivity Plan for Forest Grove the northern half of the city. In some cases, the connector alignments are not specific and are aimed at reducing potential neighborhood traffic impacts by better balancing traffic flows on neighborhood routes. The arrows shown in the figures represent potential connections and the general direction for the placement of the connection. In each case, the specific alignments and design will be better determined upon development review. In other cases, the arrow reflects a pending in-fill development project's proposed street alignment.

The criteria used for providing connections is as follows[6]:

- Every 300 to 500 foot grid for pedestrians and bicycles
- Every 500-1,000 foot grid for automobiles

To protect existing neighborhoods from potential traffic impacts of extending stub end streets, connector roadways should incorporate neighborhood traffic management into their design and construction. Neighborhood traffic management is described later in this chapter.

The arrows shown on the local connectivity figures indicate priority connections only. Topography, railroads and environmental conditions limit the level of connectivity in Forest Grove. Other stub end streets in the City's road network may become cul-de-sacs, extended cul-de-sacs or provide local connections. Connections from these stub end streets could be deemed appropriate and beneficial to the public, as future development occurs. The goal would continue to be improved city connectivity for all modes of transportation.

[6] Metro Functional Plan Title 6 calls for pedestrian/bicycle connectivity every 330 feet and motor vehicle connectivity every 530 feet.

NOT TO SCALE

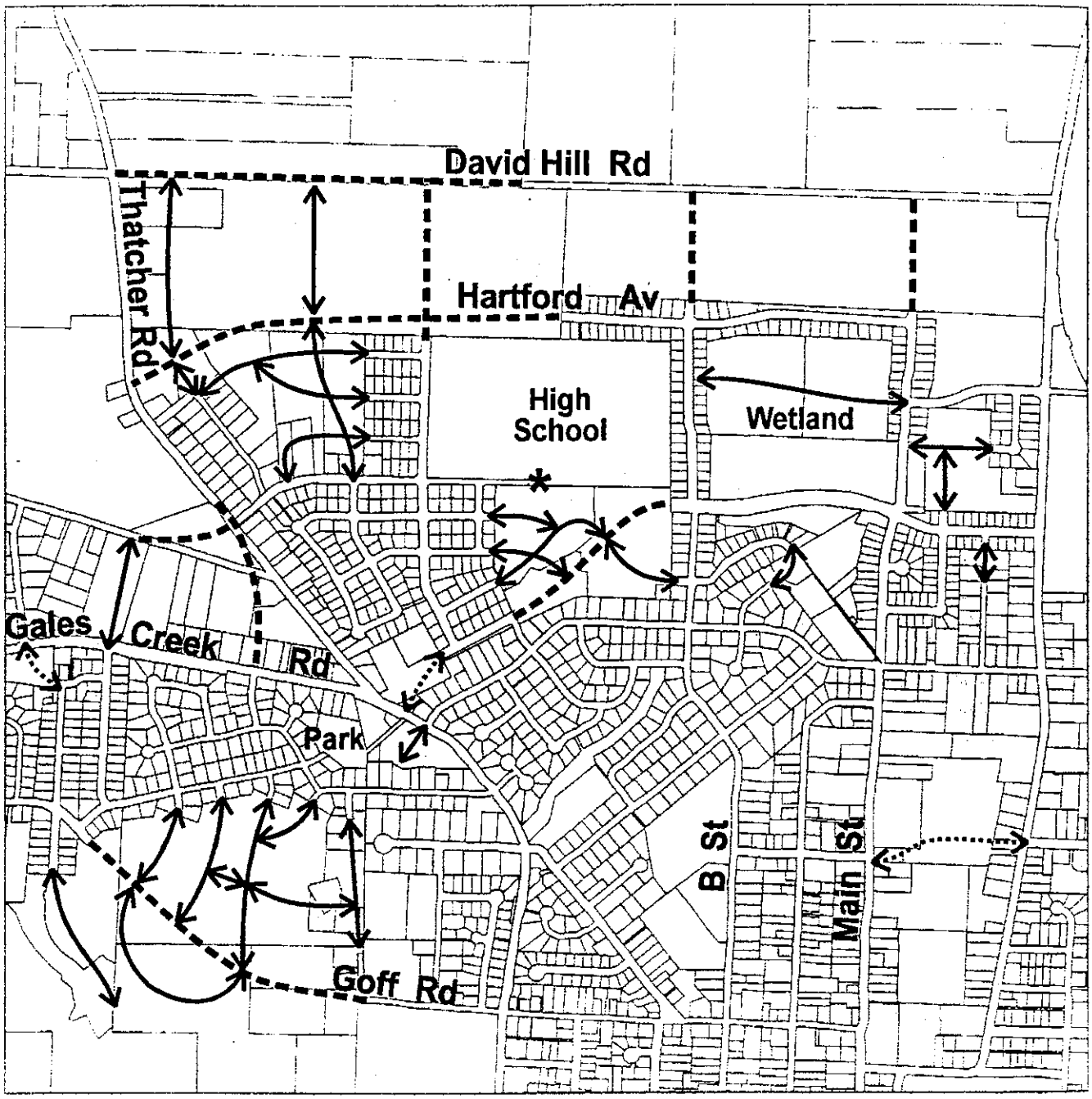

Figure 8-11
LOCAL STREET CONNECTIVITY
(NW Sector)

Legend

- Planned Roadway
- Local Street Connection
- Local Pedestrian Connection
- * Street Terminates at High School

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NOT TO SCALE

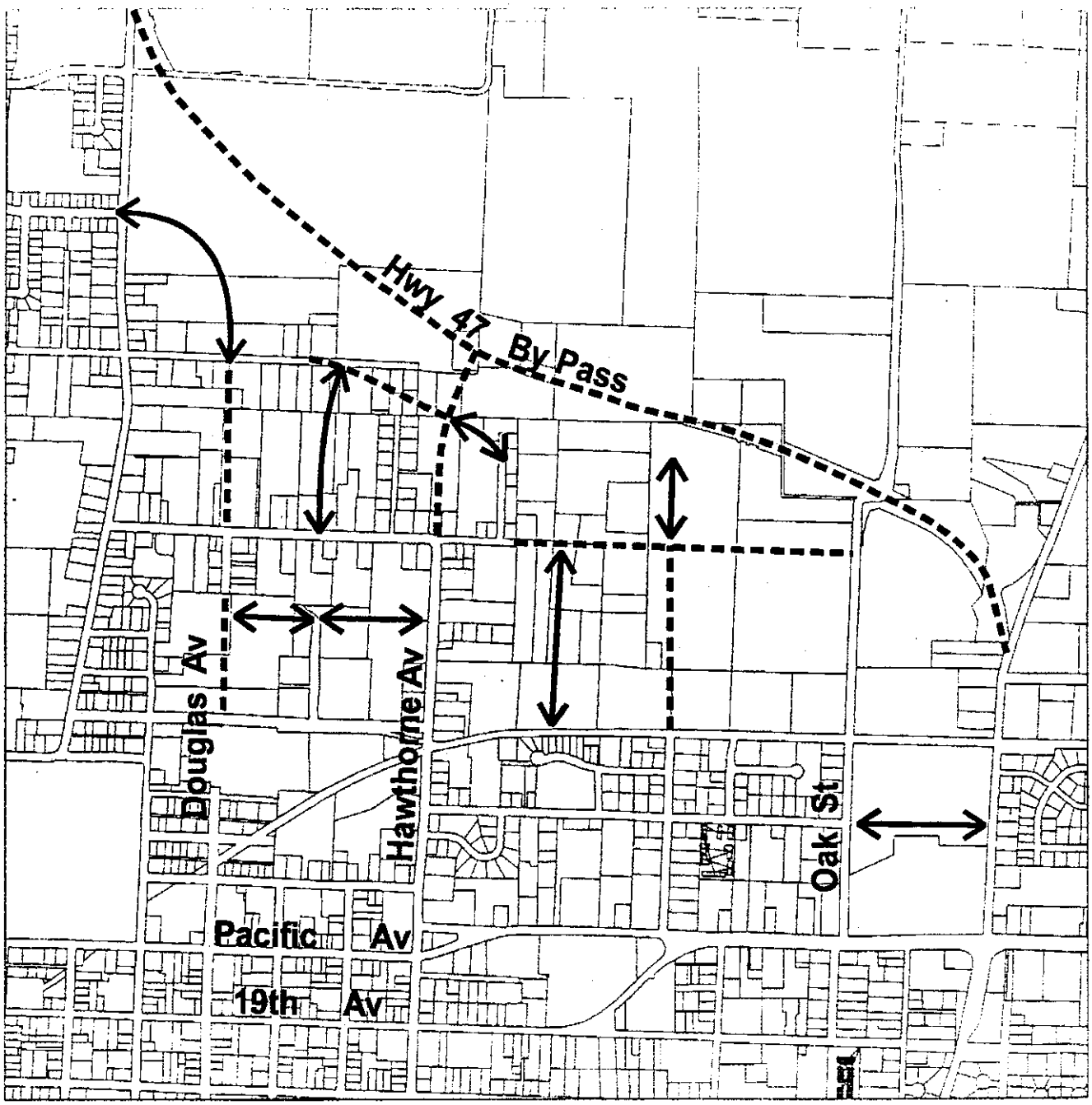

Figure 8-12
LOCAL STREET CONNECTIVITY
(NE Sector)

Legend

- Planned Roadway
- Local Street Connection

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Circulation And Capacity Needs

The motor vehicle capacity and circulation needs in Forest Grove were determined for existing and future conditions. The process used for analysis is outlined below, followed by the findings and recommendations of the analysis. The extent and nature of the street improvements for Forest Grove are generally consistent with current transportation plans. This section outlines the type of street improvements that would be necessary as part of a long range master plan. Phasing of implementation will be necessary since all the improvements cannot be done at once. This will require prioritization of projects and periodic updating to reflect current needs. Most importantly, it should be understood that the improvements outlined in the following section are a guide to managing growth in Forest Grove, defining the types of right-of-way and street needs that will be required as development occurs.

Model Forecasts

Existing conditions were identified in Chapter 3. Future capacity needs were developed using a detailed travel demand forecast tool, based on the Metro regional travel demand model. This detailed model more accurately reflects access and land use in Forest Grove than the regional travel demand model. Evening peak hour traffic volumes were forecast for the future (year 2020) scenario for the Forest Grove area. This 2020 forecast included the highest level of transit service given regional funding constraints. It assumes that Transportation Demand Management (TDM) will occur. The initial 2020 test was performed on a street network which included existing roads, plus those improvements which are currently funded and would likely be implemented before the 2020 scenario is reached. In, or near, Forest Grove, these improvements include the following:

- Highway 47 Northern Bypass (extend Highway 47 between Quince Street and Sunset Drive – Washington County and Metro RTP)
- Northerly extension of Hawthorne Avenue to the new bypass
- Forest Gale Drive (extended to David Hill Road to serve the northwest sector of the city – Local)
- Goff Road (extended westerly from terminus west of "E" Street to Willamina Avenue)

The Northern Highway 47 Bypass provided substantial relief for travel through the city and to destinations in the northern half. Future volumes on the downtown couplet were found to be similar to today's levels even in 2020.

Future Needs

Future transportation conditions were evaluated in a similar manner to existing conditions. Improvements to intersections, roadways between intersections and brand new or extended facilities were considered and a package of recommended improvements was determined.

Forecasts of 2020 traffic volumes were developed using the forecast model. These data were reviewed and refined to produce detailed year 2020 PM peak hour traffic forecasts at

intersections. When assigned to the roadway network, this level of traffic growth is expected to create the need for improvements at several locations. Table 8-4 summarizes the intersection levels of service under year 2020 base future conditions and, where required, under a mitigated scenario. Traffic signal warrant analyses were performed for all unsignalized intersections operating at LOS E or worse under future base (2020) conditions. Traffic signal warrants were based on the *Manual on Uniform Traffic Control Device*'s (MUTCD) Warrant 11 (Peak Hour Volume).[7]

Table8-4: 2020 PM Peak Hour Intersection Conditions

Street Names	*2020 Base*			*2020 Mitigated*		
Signal Controlled Intersections	*Delay*	*LOS*	*V/C*	*Delay*	*LOS*	*V/C*
Pacific Avenue/B Street	12.1	B	0.74	--		
Pacific Avenue/Main Street	11.4	B	0.82	--		
Pacific Avenue/College-Council	4.4	A	0.57	--		
Pacific Avenue/Elm Street	5.1	B	0.44	--		
TV Highway/Maple Street	11.4	B	0.82	--		
TV Highway/Quince Street	>60.0	F	>1.0	34.0	D	0.99
STOP Sign Controlled Intersection	*Major/Minor LOS*			*Overall LOS*		
19th Avenue/Council Street	A/A			--		
23rd Avenue/Main Street	A/A			--		
B Street/Willamina Avenue (4-Way STOP)	A/A			--		
Elm Street/Highway 47	B/F			B		
Gales Creek Road/Forest Gale Drive	A/B			--		
Gales Creek Road/Thatcher Road	A/B			--		
Gales Creek Road/Willamina Avenue	A/B			--		
Highway 47 Bypass/Maple Street	A/F			B		
Pacific Avenue/E Street	A/C			--		
Sunset Drive/Willamina Avenue	A/C			--		
Thatcher Road/Watercrest Road	A/B			--		

Note: Delay = Average delay (seconds) for all vehicles through the intersection
LOS = Level of Service
V/C = Volume-to-capacity ratio
Major/Minor LOS = Level of Service for the major street approach and the minor street.
-- = No mitigation required. Acceptable operations with existing/planned improvements.

Table 8-5: Traffic Signal Warrants – MUTCD Peak Hour Volume Warrant

Intersection	*Warrant Met?*
Highway 47 Bypass/Elm Street	Yes
Highway 47 Bypass/Maple Street	Yes
Sunset Drive/Willamina Avenue	No

[7] *Manual on Uniform Traffic Control Devices for Streets and Highways*, Federal Highway Administration, 1988 Edition.

Traffic Signal Guidelines

All traffic control devices should meet MUTCD standards prior to their installation. On arterial streets, signals should generally be spaced at least 1,000 feet apart for efficient operation. A detailed traffic engineering evaluation shall be conducted before the installation of any traffic signal. ODOT signal design and signal phasing guidelines should be followed for all traffic signal installations.

Road Improvements

The improvements that would mitigate 2020 conditions are described in Tables 8-6 and 8-7. Prioritization should occur in coordination with the CIP process. All improvements on arterials and collectors shall include sidewalks, bike lanes and transit facilities. These improvement lists should be used as a starting point for inclusion in regional funding programs for streets.

Assessment of Need

Based upon the evaluation of intersection level of service, three of the study intersections operate at or worse than level of service D in the 2020 evening peak hour with planned improvements. This compares with one intersection operating at this level today. The future growth caused by nearly 5,000 additional trips in the evening peak hour in 2020 as compared to today would be served substantially by the new Northern Highway 47 Bypass facility and improved connections north to US 26. The future travel demand forecasts showed that the bypass effectively served growth in the north and northwest portions of the city such that the current traffic volumes on the downtown couplet remain close to existing levels. The primary assessment of need for the future street improvements are based on implementing planned collector facilities that will serve new growth areas and improve local connectivity.

- **Highway 47 Approaching TV Highway.** The Northern Bypass will have a relatively high level of use during peak hours as a primary connection between the north and east portals of the city. The intended function of this facility was to relieve future congestion on the downtown couplet and provide preferred route for north-south truck traffic. The forecasted volumes on the Northern Bypass between Porter Road and TV Highway will require additional channelization at major intersections.
- **TV Highway**. The heaviest traffic volumes in the future will continue to be served by TV Highway at the east portal to the city. ODOT does not have plans to widen the capacity of this facility within the horizon planning year timeframe. Additional parallel facilities to service local land development and provide alternative connectivity for local origins and destinations will become increasingly important. This facility is a designated regional street and future improvements should include a raised center median to divide traffic flow and provide opportunity for street landscaping (see Figure 8-4).
- **East-West Connector between Highway 47 and Thatcher Road.** The planned growth in the northwest sector of the city will require a high quality collector or arterial facility between these two roadways. Past plans for this type of east-west connection have been modified such that the current plan via Bonnie Lane or Beal Road are no longer feasible. The first action that affected this connection was siting the high school on the previously planned Nichols Lane connection between Sunset Drive and Thatcher Road. The high

school parking lot is located within a portion of the previous right-of-way and effectively severed this route. The next action was the disconnection of Beal Road at Sunset Drive that will occur as an element of the Highway 47 Northern Bypass construction project. The initial bypass concept plan included a direct connection via Beal Road onto Sunset Drive, and, with this subsequent design change, the route is more circuitous and impacts additional fronting residences. In addition, Beal Road should downgraded from a collector to a local street.

The forecasted daily volume on this east-west connector will be 5,000 to 8,000 vehicles, a level typically served with a collector facility. The current route for this connection (see Figure 3-1) would be via Hartford Road to B Street to Bonnie Lane, and there are a large number of fronting single family residences built and planned on this route that would not be suitable for such a traffic volume level. If the Hartford Road extension to Thatcher Road were not completed, the forecasted volumes would likely impact Willamina Avenue, the only remaining east-west connection in this sector of the city. This collector facility has very similar impact concerns as does the other route noted above. A new east-west connector route is indicated to serve this purpose beyond the facilities currently shown in the city's current transportation plan. It is recommended that an alternative route be developed with appropriate fronting land uses.

- **College Way and Council Street.** The future capacity analysis confirmed that the existing circulation provided via College Way and Council Street across Pacific Avenue is not needed to serve future traffic volumes. As noted in Chapter 3, this location had the highest observed pedestrian volumes in the city. The cross streets are also offset approximately 15 feet at the centerline, making for nonstandard vehicle movements north and south. It is recommended that the College Way connection to Pacific Way be closed to motor vehicle traffic, and that the Council Street traffic flow revert to two-way movement. A visual simulation of this proposed change is shown in the appendix.
- **Lack of intersection turning capacity.** Several intersections are forecasted to have lower Levels of Service that would be best serve by turn lane channelization rather than through capacity. Several intersection turn movement improvements have been identified and are shown in Figure 8-13.

Recommended Improvement Plan

To address these deficiencies, a series of alternatives and strategies were considered. The range of strategies includes:

- **Do nothing:** This results in impacts to motor vehicle and transit circulation in Forest Grove with delays which would not be tolerable.
- **Assume that alternative modes can serve excess demand.** The TSP analysis assumed that alternative modes would be developed to their optimal levels. The order of magnitude of trips to be served in 2020 goes well beyond the capacity of the alternative mode systems by themselves, even at their optimal levels.
- **Pragmatically add capacity to all modes, developing a balanced system. Outline the long term configuration of streets to allow development to best accommodate needs.** This is the strategy that was pursued. It involves significant system

improvements, but is the only alternative that balances performance between modes, consistent with regional policy.

The mitigation measures for the street system are outlined in a series of graphics and tables. Figure 8-13 outlines the street and intersection improvements that are summarized in Table 8-6 and Table 8-7.

Table 8-6: Future Street Improvements

No.	Location	Description	Funding Status*
1	23rd/24th Avenue	Construct collector level roadway between Hawthorne Avenue and Quince Street	Planned
2	College Way	Close between 21st Avenue and Pacific Avenue to through vehicle traffic.	Not Planned
3	Council Street	Convert to two-way traffic flow. Modify traffic signal with Pacific Avenue.	Not Planned
4	David Hill Road	Extend easterly from Thatcher Road to Sunset Drive (Highway 47) as a two-lane arterial facility with left-turn lanes at major intersections.	Not Planned
5	Forest Gale Drive	Extend northeasterly to connect to David Hill Road	Planned
6	Goff Road	Extend westerly as a collector facility to connect to Willamina Avenue near Ballad Way	Planned
7	Hartford Avenue	Extend westerly as a collector facility to connect to Thatcher Road	Planned
8	Hawthorne Street	Extend northerly to intersect Northern Highway 47 Bypass. Re-align Willamina Avenue to provide adequate intersection spacing.	Planned
9	Heather Street	Extend easterly from existing terminus to connect to Heather Street in the City of Cornelius	Planned
10	Main Street	Extend through wetland area north of Willamina Avenue to connect past Bonnie Lane	Planned
11	Main Street	Extend north of Hartford Road to future David Hill Road	Not Planned
12	Yew to Holladay Connector	Construct east-west industrial collector from Yew Street easterly to connect to Holladay in the City of Cornelius.	Planned
13	Thatcher Road	Re-align Thatcher Road at its intersection with Gales Creek Road to eliminate substandard angles and improve intersection spacing.	Not Planned
14	26th Avenue	Extend from terminus east of Sunset Drive to Oak Street	Planned
15	B Street	North extension from Hartford Avenue to David Hill Road	Not Planned
16	Laurel Street	Upgrade to collector standards and extend northerly to 26th Avenue	Not Planned

Note: *All Projects include sidewalks, bicycle lanes and transit accommodations as required.

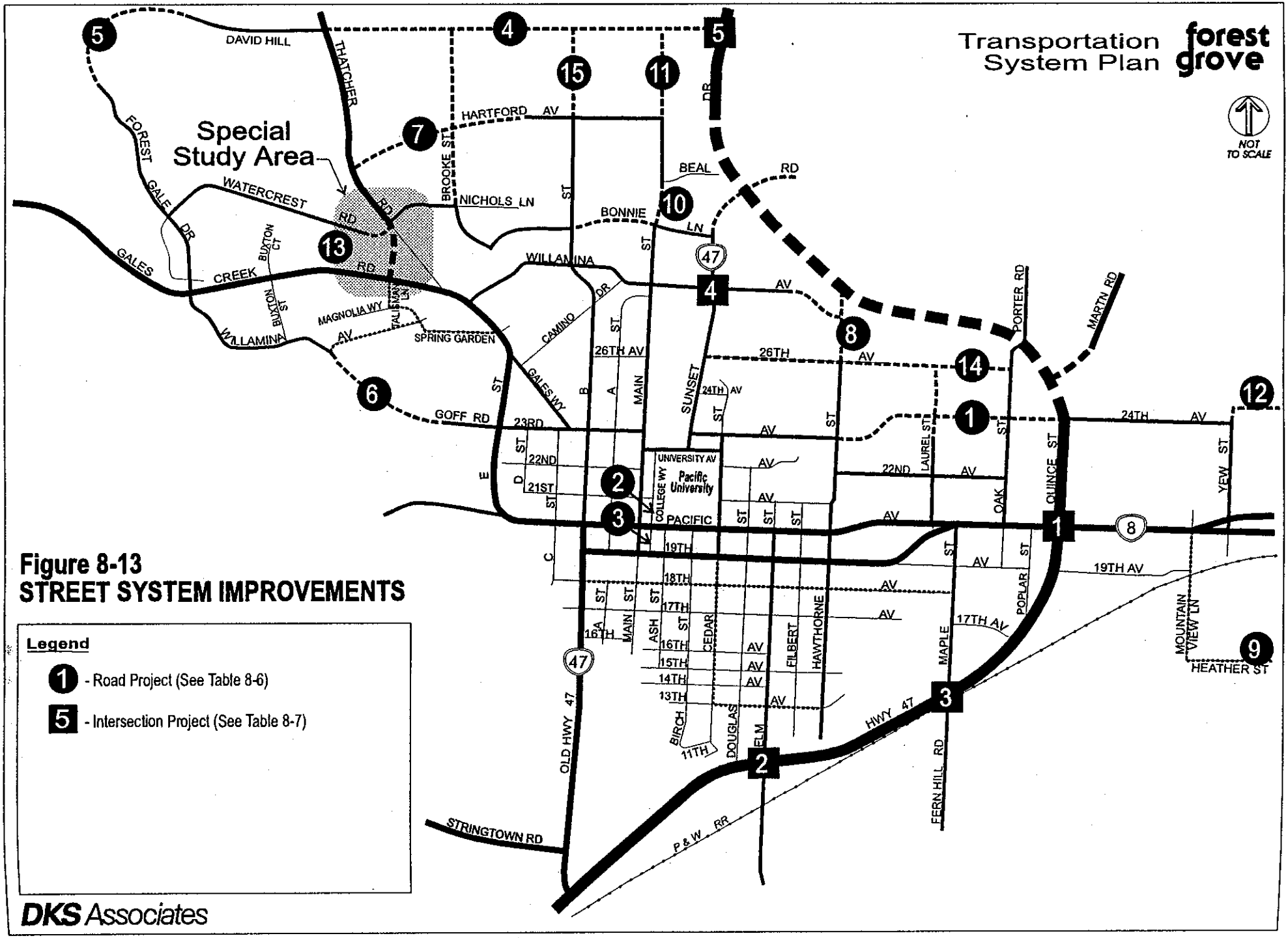

Figure 8-13
STREET SYSTEM IMPROVEMENTS

Legend

1 - Road Project (See Table 8-6)

5 - Intersection Project (See Table 8-7)

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Table 8-7: City of Forest Grove 2020 Intersection Improvements

No.	*Intersection*	*Description**
1	TV Highway/Quince Street	Southbound dual left-turn lane, and separate thru lane
		Westbound right-turn lane
		Westbound second left-turn lane
		Northbound separate left-turn lane
		Modify traffic signal for north-south concurrent movements
2	Highway 47/Elm Street	Install Traffic Signal Controls
3	Highway 47/Maple Street	Install Traffic Signal Controls
4	Sunset Drive/Willamina Avenue	Northbound left-turn lane
		Southbound left-turn lane
		Alternatively, consider roundabout for traffic controls
5	Highway 47/David Hill Road	Northbound left-turn lane
		Southbound left-turn lane
		Eastbound left-turn lane
		Install traffic signal controls
6	Traffic Signal Emergency Preemption	Install preemption equipment at all traffic signal controlled intersections (13 existing locations).

Intersection Turning Capacity: A series of intersection improvements were identified which primarily add turning movement capacity (Table 8-7 and Figure 8-13). These roadway improvements typically consist of left and right turn lanes and/or traffic signals. Five of the study intersections require significant improvements. An alternative to traffic signal controls should be considered at Sunset/Willamina. This location would be a good candidate for a conventional roundabout design. The initial cost of the roundabout is similar to traffic signal controls, but the on-going maintenance costs are substantially less.

Traffic Signals

To guide future implementation of traffic signals to locations which have the maximum public benefit by serving arterial/collector/neighborhood routes, a framework master plan of traffic signal locations was developed (Figure 8-14). The intent of this plan is to outline potential locations where future traffic signals would be placed to avoid conflicts with other development site oriented signal placement. To maintain the best opportunity for efficient traffic signal coordination on arterials, spacing of up to 1,000 feet should be considered. No traffic signal should be installed unless it meets **Manual of Uniform Traffic Control Devices** warrants. Three key traffic signal issues should be addressed within the transportation policy of Forest Grove:

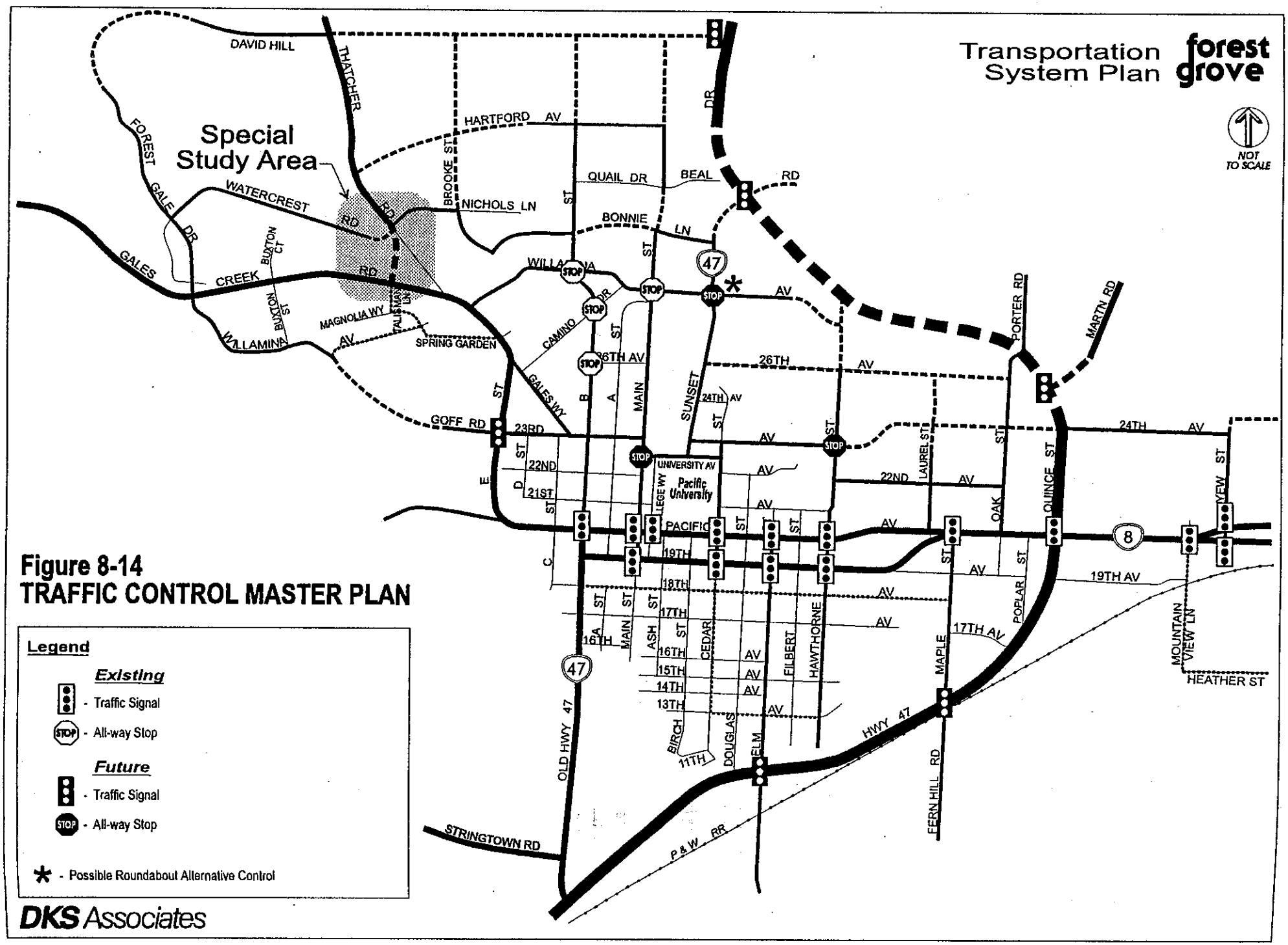
- Establishing a traffic signal spacing standard of 1,000 feet and a traffic signal master plan to guide future traffic signal placements. When this standard is not met, additional evaluation should be prepared to assure signal progression can be efficiently maintained.

Traffic signals disrupt traffic flow. Their placement is important for neighborhood access, pedestrian access and traffic control. To not utilize the limited placements of traffic signals to serve private land holdings will limit the potential for use that will generally benefit the public, neighborhoods and pedestrian access. Limiting placement of traffic signals to locations that are public streets would minimize or eliminate the potential for traffic signals solely serving private access.

Signals to Revert to the City – Once the Highway 47 Northern Bypass is completed, three traffic signals on Pacific Avenue will revert to the city's control and maintenance. These are located at College Way-Council Street, Main Street and B Street intersections. The other signals along the Pacific/19th couplet will continue to be maintained by ODOT forces.

Emergency Vehicle Preemption – The existing traffic signals do not have the capability to be preempted by emergency vehicles. This is a significant asset to reducing emergency response time. This technology is readily available and includes receivers at each intersection, transmitters in emergency vehicles, and control units attached to the existing signal controllers. The existing controllers may require upgrades to enable this feature. The general cost for adding these units is $10,000 per intersection. This type of installation is recommended for every traffic signal in the city.

Traffic Signal Coordination – The existing traffic signals along the couplet generally are configured to provide progressive traffic flow through town. The design speed is 30 miles per hour. These are fixed-time settings that are not responsive to fluctuations in traffic demands, but they can be effective on one-way grid patterns. The traffic signal at Pacific Avenue and B Street operates as a fixed-time controller. During peak periods when volume fluctuates, the controller is not responsive to changes in demand. To upgrade this signal will require traffic detectors loops and new signal timing plans. The upgrade cost may range from $15,000 to $30,000 depending on the state of the existing equipment.


Transportation System Plan
forest grove
NOT TO SCALE
Special Study Area
DAVID HILL
THATCHER
FOREST GALE DR
WATERCREST RD
GALES CREEK RD
BUXTON CT
BUXTON ST
WILLAMINA AV
MAGNOLIA WY
TALBOT LN
SPRING GARDEN
BROOKE ST
HARTFORD AV
NICHOLS LN
QUAIL DR
BEAL RD
BONNIE LN
WILLAMINA
CAMINO DR
GALES WY
GOFF RD
23RD AV
26TH AV
24TH AV
SUNSET
MAIN ST
A ST
B ST
C ST
D ST
E ST
22ND ST
21ST ST
UNIVERSITY AV
LEGE WY
Pacific University
PACIFIC AV
19TH AV
18TH AV
17TH AV
16TH AV
15TH AV
14TH AV
13TH AV
11TH
ASH ST
CEDAR ST
DOUGLAS
BIRCH
ELM
FILBERT
HAWTHORNE
MAPLE
LAUREL ST
OAK ST
POPLAR ST
QUINCE ST
YEW ST
PORTER RD
MARTN RD
MOUNTAIN VIEW LN
HEATHER ST
FERN HILL RD
HWY 47
OLD HWY 47
STRINGTOWN RD
P & W RR
47
8
STOP
*
Figure 8-14
TRAFFIC CONTROL MASTER PLAN
Legend
Existing
- Traffic Signal
- All-way Stop
Future
- Traffic Signal
- All-way Stop
* - Possible Roundabout Alternative Control
DKS Associates

Alternatives

Downtown Couplet Two-Way Flow Alternative

The central east-west arterial facility is formed by the one-way couplet of Pacific Avenue and 19th Avenue. The couplet spans downtown between B Street on the west side to Laurel Street on the east side. Through the town center planning process, an alternative emerged that would convert this one-way couplet to two-way operation. The implications of the two-way flow conversion were evaluated for their impacts on traffic flows at major intersections and for the ability to accommodate alternative modes. A summary of the key issues is presented in Table 8-8 below.

Table 8-8: Relative Impacts of Modifying the One-Way Couplet

Issues	*One-Way Flow*	*Two-Way Flow*	*Advantage*
Peak Hour Intersection Operations	LOS C or better on all intersections controlled by signals	Main/Pacific LOS B with left-turns, LOS D with shared left-thru lanes. All other intersections operate similarly with or without separate left-turn lanes.	One-Way
Traffic Signal Coordination Issues	45 to 55 second cycles. Pedestrian friendly. Minimal vehicle queues. Progression speed 30 mph.	Longer cycles (up to 80 sec.) required to handle more conflicting movements. Longer delays for vehicles and pedestrians.	One-Way
On-Street Parking Impacts	Allows parallel parking on both sides of street.	Center turn-lane at major cross streets requires parking removal. If separate turn-lane not provided, turning traffic would block through traffic, degrade LOS.	One-Way
Bike Facilities	Shared roadway with vehicles. Sufficient paved width for dedicated bike lane and minimum standard parking and travel lanes.	Insufficient width for conventional two-way bike lanes without on-street parking removal.	One-Way
Fronting Business Traffic Volumes	Balanced volumes on both Pacific Avenue and 19th Avenue	Balanced volumes on both Pacific Avenue and 19th Avenue	No difference

Overall, the traffic operations were generally degraded under two-way traffic flows. As noted above, the traffic signals would have longer cycles with correspondingly longer delays for vehicles and pedestrians. However, the worst case condition for the two-way flow was at Main/Pacific where the LOS B operation would degrade to LOS D. In many cases, a LOS D is acceptable in a downtown urban setting for horizon year planning purposes.

Accommodating Bike Lanes – Perhaps the most significant issue was the ability to provide on-street bike lanes. The general paved width on Pacific Avenue is 40 feet between curbs and on 19th Avenue it is 44 feet wide. Referring to Figure 8-15, three cross-sections on Pacific Avenue are shown with one-way flow and no bike lanes, with two-way flow and bike lanes, and one-way flow with a bike lane. The minimum acceptable dimension for two-way flow and bike lanes is 48 feet between curbs, or eight feet greater than most segments of Pacific Avenue. Conventional design of bike lanes dictate two-way circulation between the travel lane and the parking lane. The choice in this case would be to either remove parking on one side of the street or to force one-half of the bike route onto 19th Avenue. However, splitting the bike route in such a manner is contrary to the conventional design practices for bike lanes that dictate two-way circulation between the vehicle travel lane and the parking lane. The last cross-section for one-way traffic flow shows that will some reduction in the existing parking and travel lanes, a single bike lane can be provide in the same direction as vehicle traffic. The narrower lanes would not be required on 19th Avenue since it generally has another four feet between curbs.

Visual Simulation – A visual illustration attached in the appendix shows that possible operation of Pacific Avenue at Main Street with one-way and two-way traffic flow. The two-way flow would have bike lanes on both sides of the street and parking on one side only.

Overall, the above analysis indicates that one-way flow is the best solution for traffic circulation, level of service and ability to serve the planned bike lane on the couplet. It is recommended that this configuration be retained in the circulation plan.

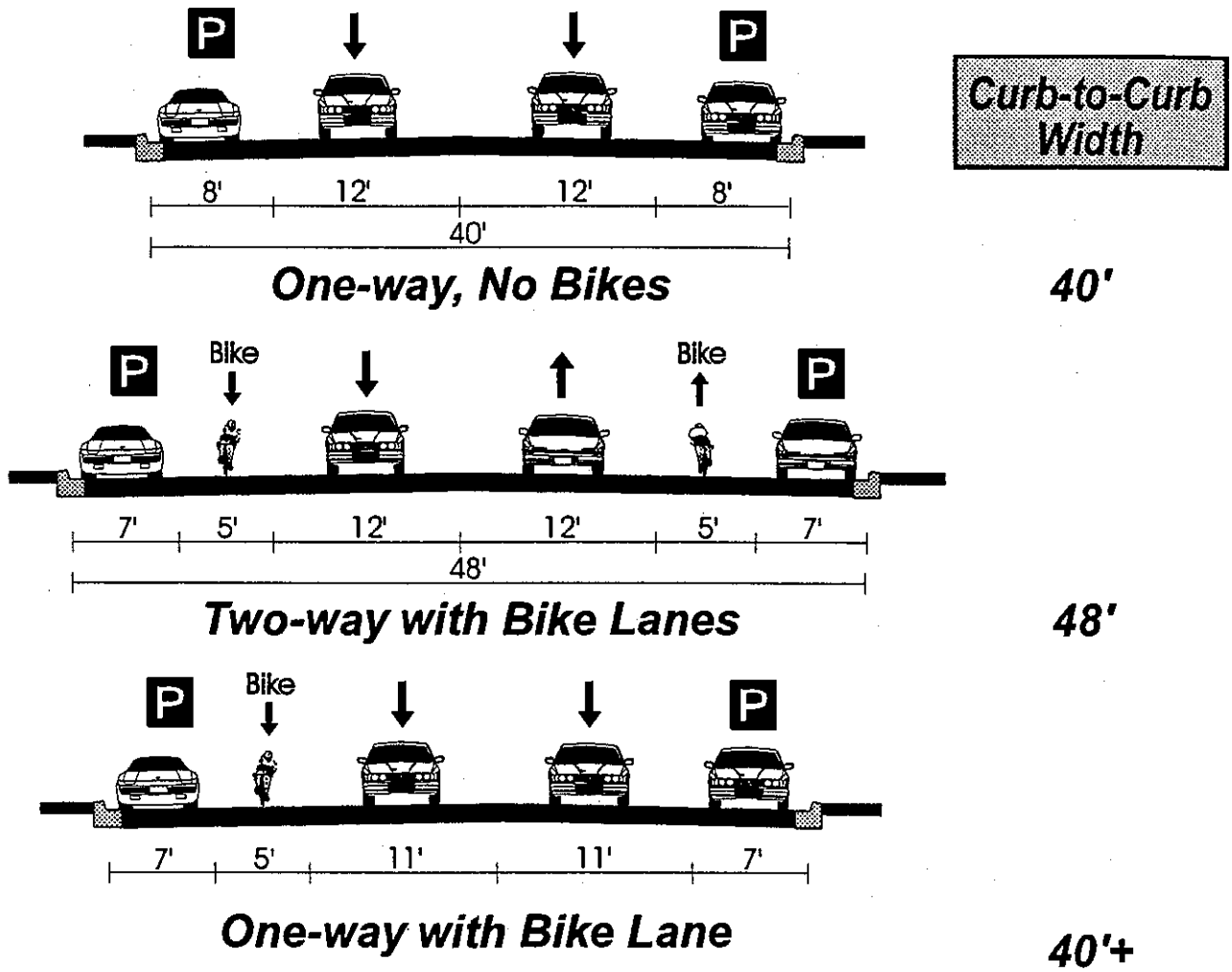


Figure 8-15
PACIFIC AVENUE CROSS-SECTIONS

Legend

P = *Parking Lane*

DKS Associates

Connectivity Between Main Street and Sunset Drive

Another special circulation issue that surfaced during the town center plan development was the need for better street connectivity between Main Street and Sunset Drive. Even after the Northern Highway 47 Bypass is completed, Sunset Drive will continue to be the primary northern gateway into the central city area. The objective of better connectivity to Main Street is to provide more traffic along fronting businesses in the downtown core.

Referring to Figure 8-16, the two streets are joined at University Avenue, then again at Willamina Avenue, approximately one-half mile to the north. Five alternative connections are shown within this segment including three new street connections. Traffic forecasts for this connection show moderate traffic levels, 2,000 to 3,000 vehicles daily. This volume of traffic would be served adequately with a collector facility. Typical collector streets require 60 to 70 feet of right-of-way. The length of the new roadways varies from 800 to 1,000 feet. The rough cost of a new street connection would be $300,000 to $400,000, excluding right-of-way. The relative benefits and impacts of each route alternative are discussed below.

1. University Avenue – This existing roadway has sufficient width to provide the facilities required for a collector street connection (i.e., bike lanes). It is the current route into the downtown area. It has a relatively high volume of crossing pedestrian traffic between the college campus and the adjoining housing facilities and parking areas. If this route is selected, roadway design elements could be added at the intersection with College Way to direct traffic through to Main Street. In addition, the existing pedestrian crossings could be enhanced with curb extensions and speed humps to reduce traffic speeds. An important related issue is that the College Way connection to Pacific Avenue is recommended to be terminated for vehicle traffic. This modification will significantly reduce the demand for turning traffic at the University/College intersection, and make this route more attractive.
2. 23rd Place – This alignment would connect to Sunset Drive at 23rd Place then traverse through the student housing area and adjoining parking with a connection to Main Street north of 23rd Avenue. Referring to Figure 8-16, this appears to be very disruptive to local pedestrian access to the existing facilities and could require removal of structures or existing parking. Also, the spacing between the new intersection formed on Main Street and the Main/23rd Avenue intersection is substandard for a collector facility.
3. 24th Avenue – This alignment would connect to Sunset Drive near 24th Avenue, traverse between Lincoln Park and the student housing facilities, then connect to Main Street midway between 23rd and 26th Avenues. This route is less disruptive than Route #2, but it potentially requires removal of one to two structures. The route would cross existing and planned multi-use paths serving the park area.
4. South of Willamina Avenue – This alignment would connect to Sunset Drive a few hundred feet south of Willamina Avenue, traverse through undeveloped open field currently designated for high density residential use, then connect to Main Street near the Lincoln Park parking lot access. Impacts to existing uses will be relatively minor. The new intersection with Sunset Drive is too close to Willamina Avenue for a collector facility. Also, a connection this far north on Main Street would increase "through" traffic along the residential portion.
5. Willamina Avenue – The final alignment uses the existing roadway on Willamina Avenue between Sunset Drive and Main Street. This connections has three possible

concerns including impacts on fronting residential uses, the narrow existing width of Willamina Avenue and lack of bike or pedestrian facilities along this segment, and the added "through" traffic along the residential portion of Main Street (north of 23rd Avenue).

Based on the above discussion and the relatively high cost of constructing a new street connection, the best choice appears to be #1 – University Avenue. As noted above, this route would adequately serve the expected travel demands, and could be readily modified to improved pedestrian crossings and direct inbound traffic to Main Street. This connection is recommended.

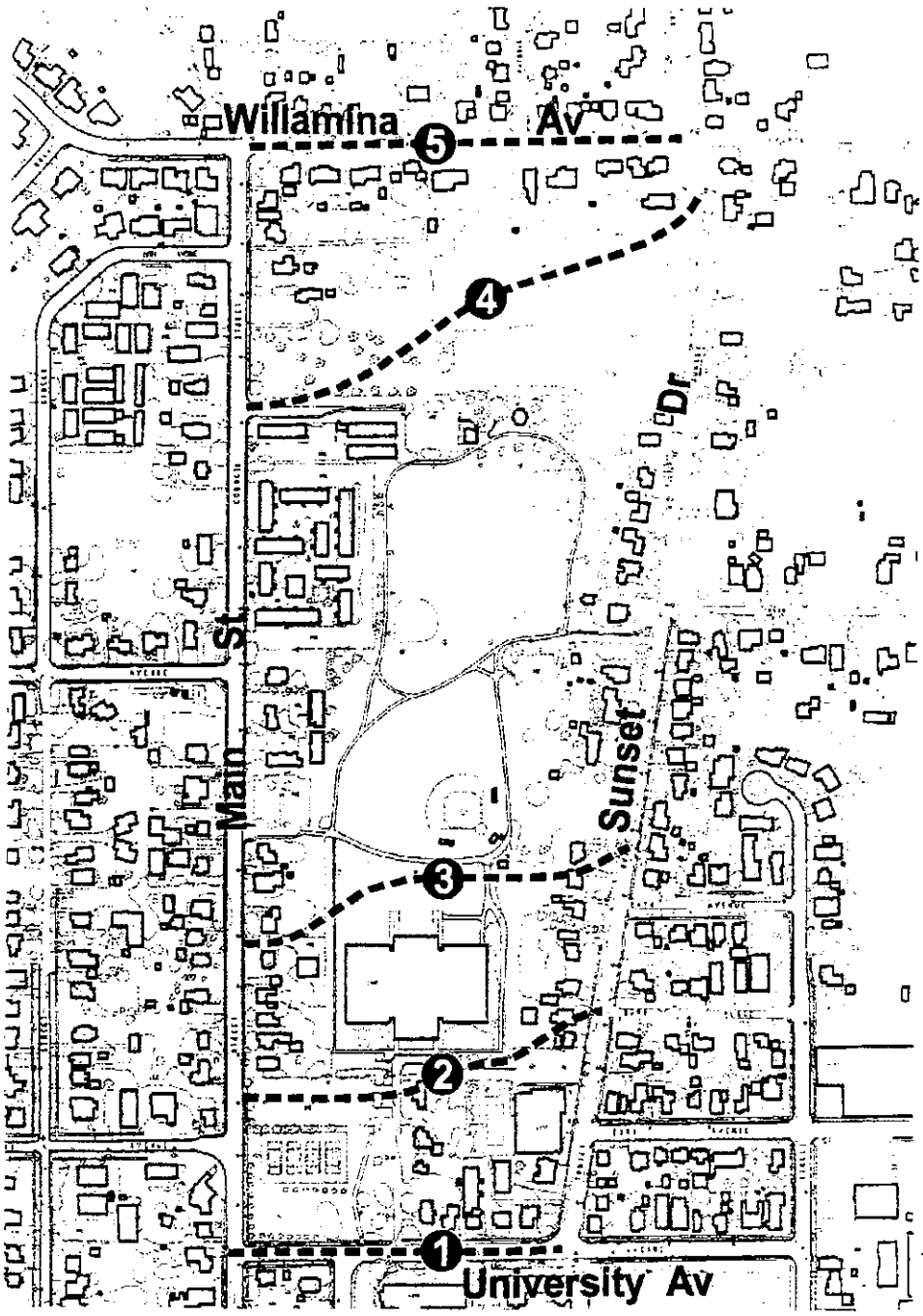


Figure 8-16
MAIN STREET TO SUNSET DRIVE CONNECTIONS

Legend

1 - Alternative Connection Routes

Note: Built Environment as of 1991

Safety

Needs

Accident data was obtained for the City of Forest Grove from ODOT. Chapter 3 provides detailed data regarding motor vehicle accidents in Forest Grove. Several strategies are suggested for improving safety in the City of Forest Grove. These strategies aimed at providing the City with priorities that meet the goals and policies of the City.

- Work with other agencies such as Washington County and ODOT to help prioritize and fund safety programs - coordinated approach
- Develop a citywide safety priority system which identifies high accident locations, ranks the locations and identifies safety mitigation measures
- Address safety issues on an as needed basis

Suggested Improvements

Most of these high accident locations are included in future street improvements listed in Tables 8-5 and 8-6. In the short term, specific action plans should be prepared to address whether beneficial improvements at these locations can be made without affecting future plans.

A future issue with regard to safety involves the decision to go to three lanes from two lanes or five lanes from four lanes. National research has clearly demonstrated the benefits of providing a turning lane when daily traffic volumes exceed 15,000 vehicles per day[8]. While widening the street can commonly be viewed as pedestrian unfriendly, the potential impact of not having a turning lane is that accident rates will increase substantially (11 to 35 percent) on two lane roads compared to three lane roads.

One safety action that can have an immediate impact is to condition all land use development projects that require access on city streets to maintain adequate sight distance. This should address all fixed or temporary objects (plants, poles, buildings, signs, etc.) that potentially obstruct sight distance. Any property owner, business, agency or utility that places or maintains fixed or temporary objects in the sight distance of vehicles, bicycles or pedestrians should be required to demonstrate that adequate sight distance is provided (per American Association of State Highway and Transportation Officials).[9]

Maintenance

Preservation, maintenance and operation are essential to protect the City investment in transportation facilities. The majority of current gas tax revenues are used to maintain the transportation system. With an increasing road inventory and the need for greater maintenance of older facilities, protecting and expanding funds for maintenance is critical.

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[8] Multilane Design Alternatives for Improving Suburban Highways, TRB NCHRP Report No. 282, March 1986.

[9] "A Policy on Geometric Design of Highways and Streets", Green Book American Association of State Highway and Transportation Officials, 1994.

A Pavement Management Program is a systematic method of organizing and analyzing information about pavement conditions to develop the most cost effective maintenance treatments and strategies. As a management tool, it aids the decision-making process by determining the magnitude of the problem, the optimum way to spend funds for the greatest return on the dollar, and the consequences of not spending money wisely. Forest Grove maintains an annual program of pavement management and monitors conditions in setting priorities for overlays, slurry seals and joint sealing. With over 64 miles of roadway to maintain, road maintenance is one of the largest transportation expenditures, requiring about roughly $260,000 per year.

A pavement management program can be a major factor in improving performance in an environment of limited revenues. A pavement management program is not and should not be considered the answer to every maintenance question. It is a tool that enables the public works professional to determine the most cost-effective maintenance program. The concept behind a pavement management system is to identify the optimal rehabilitation time and to pinpoint the type of repair which makes the most sense. With a pavement management program, professional judgment is enhanced, not replaced.

A visual inspection of Forest Grove's surface street system was conducted. This inspection, basically a "report card" of the street system rates each roadway in Forest Grove. Actual roadway ratings prepared by the City of Forest Grove are provided in the appendix. Table 8-9 summarizes the roadway maintenance funding history for the last four fiscal years

A critical concept is that pavements deteriorate 40 percent in quality in the first 75 percent of their life. However, there is a rapid acceleration of this deterioration later, so that in the next 12 percent of life, there is another 40 percent drop in quality. A pavement management system can identify when pavements will begin to deteriorate before rapid deterioration starts to focus preventative maintenance efforts cost effectively. These solutions are generally one-fifth to one-tenth the cost required after a pavement is 80 percent deteriorated. Figure 8-17 illustrates the pavement life cycle. For this reason, support of gradual increases to the gas tax to support maintenance is critical.

Table 8-9: City of Forest Grove Street Maintenance Budget Summary

Requirements	*FY 96-97*	*FY 97-98*	*FY 98-99*	*FY 99-00*
	Actual	Actual	Budgeted	Budgeted
Operating Supplies	$ 2,120	$ 4,500	$ 4,500	$ 4,500
Street Maintenance Services	61,650	265,000	265,000	240,000
Office Equipment	3,100	2,000	1,000	1,000
Traffic Calming	0	0	0	0
Total	$ 66,870	$ 271,500	$ 270,500	$ 245,500
Transfer to General Fund *	197,300	191,600	181,000	188,200

Note: Budget data provided by Cal Bowersox, Public Works Superintendent

* Gas tax revenues transferred to non-revenue generating uses

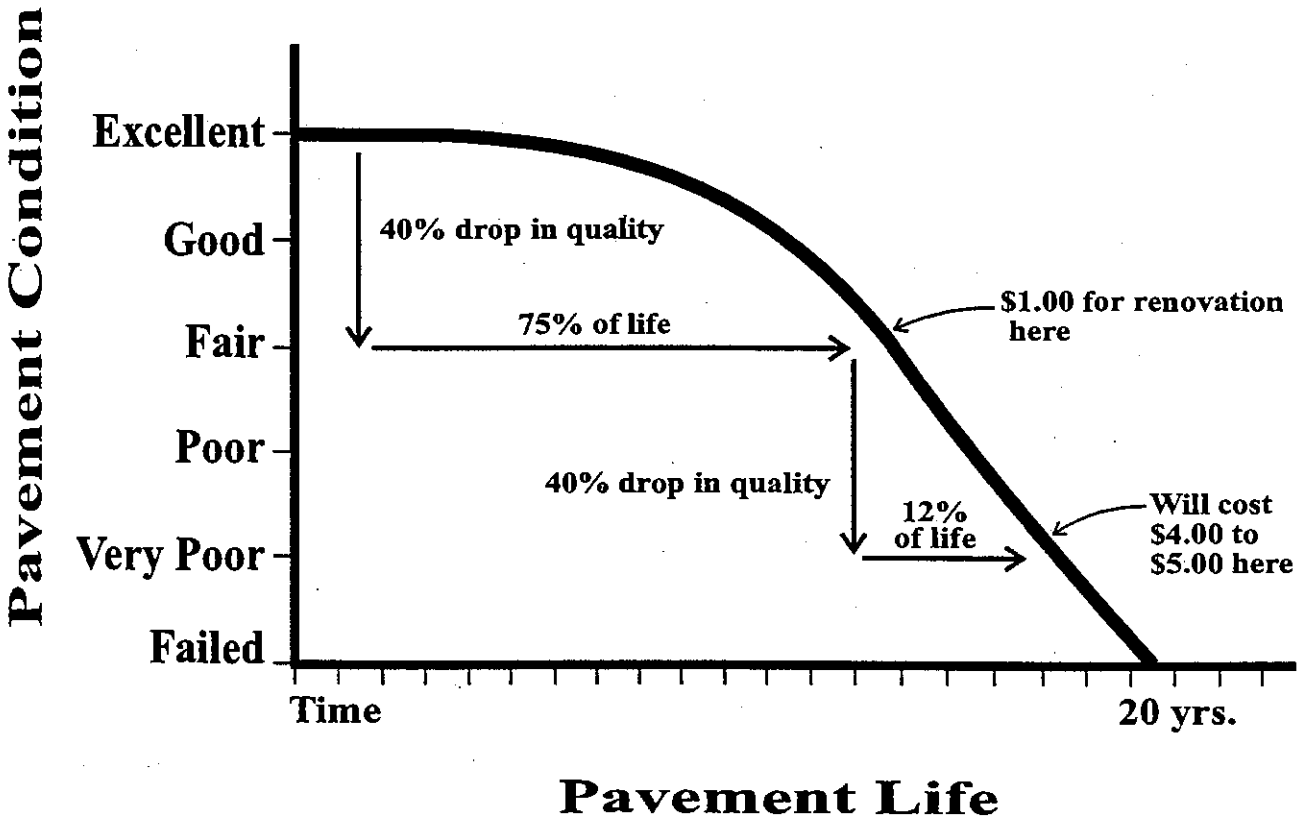


Figure 8-17
PAVEMENT LIFE CYCLE

Neighborhood Traffic Management

Neighborhood Traffic Management (NTM) is a term that has been used to describe traffic control devices typically used in residential neighborhoods to slow traffic or possibly reduce the volume of traffic. NTM is descriptively called traffic calming due to its ability to improve neighborhood livability. Forest Grove has done very little in the way of testing and implementing NTM measures such as speed humps, chokers, pavement texturing, circles, chicanes and other elements. The City has no formalized NTM program. The following are examples of neighborhood traffic management strategies:

- speed wagon (reader board that displays vehicle speed)
- speed humps
- traffic circles
- medians
- landscaping
- curb extensions
- chokers (narrows roadway at spots in street)
- narrow streets
- closing streets
- photo radar
- on-street parking
- selective enforcement
- neighborhood watch

Typically, NTM can receive a favorable reception by residents adjacent to streets where vehicles travel at speeds above 30 MPH. However, NTM can also be a very contentious issue within and between neighborhoods, being viewed as moving the problem rather than solving it, impacting emergency travel or raising liability issues. A number of streets in Forest Grove have been identified in the draft functional classification as neighborhood routes. These streets are typically longer than the average local street and would be appropriate locations for discussion of NTM applications. A wide range of traffic control devices are being tested throughout the region, including such devices as chokers, medians, traffic circles and speed humps. NTM traffic control devices should be tested within the confines of Forest Grove before guidelines are developed for implementation criteria and applicability. Also, NTM may be considered in an area wide manner to avoid shifting impacts between areas and should only be applied where a majority of neighborhood residents agree that it should be done. Strategies for NTM seek to reduce traffic speeds on neighborhood routes, thereby improving livability. Research of traffic calming measures demonstrates their effectiveness in reducing vehicle speeds. Table 8-10 summarizes nationwide research of over 120 agencies in North America.

It is recommended that the City explore the development of a NTM program. This program can use regional experience and success to help prioritize implementation and address issues on a systematic basis rather than a reactive basis. Criteria should be established for the appropriate application of NTM in the City. This would address warrants, standards for design, funding, special conditions for functional classifications other than neighborhood routes and the required public process.

Table 8-10: Neighborhood Traffic Management Performance

Measures	No. of Studies	*Speed Reduction (MPH)*			*Volume Change (ADT)*			Public Satisfaction
		Low	High	Ave.	Low	High	Ave.	
Speed Humps	262	1	11.3	7.3	0	2922	328	79%
Speed Trailer	63	1.8	5.5	4.2	0	0	0	90%
Diverters	39	-	-	.4	85	3000	1102	72%
Circles	26	2.2	15	5.7	50	2000	280	72%
Enforcement	16	0	2	2	0	0	0	71%
Traffic Watch	85	.5	8.5	3.3	0	0	0	98%
Chokers	32	2.2	4.6	3.3	45	4100	597	79%
Narrow Streets	4	5	7	4.5	0	0	0	83%

SOURCE: *Survey of Neighborhood Traffic Management Performance and Results, ITE District 6 Annual Meeting, by R S. McCourt, July 1997.*

Parking

Parking has typically been a benign transportation issue in the past for Forest Grove. New land uses were required to provide the code designated number of parking spaces to assure there would be no impact to surrounding land uses (overflow parking). These parking ratios were developed based upon past parking demand characteristics of each land use type. Most recently, parking has become an element of transportation planning policy through two actions. The adoption of the Transportation Planning Rule in 1991, which was updated in November 1998 (sections 660-12-020(2g) and 660-12-045(5c)) and the Metro Functional Plan of November 1996, Title 2. By adopting the minimum and maximum parking ratios outlined in Title 2, the City will be able to address the TPR required reduction in parking spaces per capita over time.

Several strategies were identified to address the desire to reduce parking needs in Forest Grove:

- Shared parking
- Parking pricing

- Parking needs should be reviewed by individual developments at the site plan review stage. Parking provisions should be compared to demand, as identified by ITE or DEQ.[10]
- Maximum Parking Ratios

One of the concerns with parking reduction policies is the impact to adjacent land uses should the vehicle needs of a site exceed the provision of parking.

Access Management

Access management is important, particularly on high volume roadways for maintaining traffic flow and mobility. Where local and neighborhood streets function to provide access, collector and arterial streets serve greater traffic volume. Numerous driveways or street intersections increase the number of conflicts and potential for accidents and decrease mobility and traffic flow. Forest Grove, as with every city, needs a balance of streets which provide access with streets that serve mobility.

Several access management strategies were identified to improve access and mobility in Forest Grove:

- Provide left turn lanes where warranted for access onto cross streets
- Work with land use development applications to consolidate driveways where feasible
- Meet Washington County/ODOT access requirements on arterials
- Establish City access standards for new developments
- Develop city access requirements that are consistent with Metro Title 6 access guidelines

The following recommendations are made for access management:

- Incorporate a policy statement regarding prohibition of new single family residential access on arterials and collectors. A design exception process should be outlined that requires mitigation of safety and NTM impacts. This addresses a problem in Forest Grove where property owners consume substantial staff time on issues of residential fronting impacts.
- Use Washington County and ODOT standards for access on arterials and collectors.
- Specific access management plans be developed for David Hill Road, Pacific Avenue and 19th Avenue to maximize the capacity of the existing facilities and protect their functional integrity.

[10] *Parking Demand*, 2nd Edition, Institute of Transportation Engineers, 1987; and *Peak Parking Space Demand Study*. Oregon Department of Environmental Quality, by JHK & Associates, June 1995.

Transportation Demand Management

The Transportation Planning Rule outlines a goal of reducing vehicle miles traveled (VMT) per capita. Transportation Demand Management is the general term used to describe any action that removes single occupant vehicle trips from the roadway network during peak travel demand periods. The following are examples of TDM measures:

- Work with employers to install bicycle racks
- Work with property owners to place parking stalls for carpoolers near building entrances
- Provide information regarding commute options to larger employers
- Encourage linkage of housing, retail and employment centers
- Encourage flexible working hours
- Encourage telecommuting
- Provide incentives to take transit and use other modes (i.e. free transit pass)
- Schedule deliveries outside of peak hours

Transportation System Management/ Intelligent Transportation Systems

Transportation System Management (TSM) focuses on low cost strategies to enhance operational performance of the transportation system. Measures that can optimize performance of the transportation system include signal improvements, intersection channelization, access management (noted in prior section), HOV lanes, ramp metering, rapid incident response, and programs that smooth transit operation. The most significant measure that can provide tangible benefits to the traveling public is traffic signal coordination and systems. Traffic signal system improvements can reduce the number of stops by 35 percent, delay by 20 to 30 percent, fuel consumption by 12.5 percent and emissions by 10 percent[11]. This can be done without the major cost of roadway widening.

Several of the strategies are elements of an Intelligent Transportation System (ITS) plan being implemented regionally by ODOT and participating agencies. ITS focuses on a coordinated, systematic approach toward managing the region's transportation multi-modal infrastructure. ITS is the application of new technologies with proven management techniques to reduce congestion, increase safety, reduce fuel consumption and improve air quality. One element of ITS is Advanced Traffic Management Systems (ATMS). ATMS collects, processes and disseminates real-time data on congestion alerting travelers and operating agencies, allowing them to make better transportation decisions. Examples of future ITS applications include routine measures such as "smart" ramp meters, automated vehicle performance (tested recently in San Diego), improved traffic signal systems, improved transit priority options and better trip information prior to making a vehicle trip (condition of roads - weather or congestion, alternative mode options - a current "real time" schedule status, availability/pricing of retail goods). Most of this information will be

[11] *Portland Regionwide Advanced Traffic Management System Plan*, ODOT, by DKS Associates, October 1993.

developed by ODOT or other ITS partners (private and public). The information will be available to drivers in vehicles, people at home, at work, at events or shopping. The Portland region is just starting to implement ITS and the City of Portland and ODOT have already developed their own ITS strategic plans.

Trucks

Efficient truck movement plays a vital role in maintaining and developing Forest Grove's economic base. Well planned truck routes can provide for the economical movement of raw materials, finished products and services. Trucks moving from industrial areas to regional highways or traveling through Forest Grove are different than trucks making local deliveries. The transportation system should be planned to accommodate this goods movement need. The establishment of through truck routes provides for this efficient movement while at the same time maintaining neighborhood livability, public safety and minimizing maintenance costs of the roadway system. A map of proposed through truck routes in Forest Grove was developed (Figure 8-18). This is aimed at addressing the through movement of trucks, not local deliveries. The objective of this route designation is to allow these routes to focus on design criteria that is "truck friendly", i.e., 12 foot travel lanes, longer access spacing, 35 foot (or larger) curb returns and pavement design that accommodates a larger share of trucks. Because these routes are through routes and relate to regional movement, the Metro regional freight system was reviewed. The Draft Regional Transportation Plan[12] includes the following routes in the regional freight system in Forest Grove, which are consistent with the city map:

Table 8-11: Metro Local Freight Designations

Regional Highway	*Metro Freight Designation*
ORE 47	Road Connector
ORE 8 (TV Highway)	Road Connector

Criteria

Forest Grove's Technical Advisory Committee created a set of goals and policies to guide transportation system development in Forest Grove (see Chapter 2). Several of these policies pertain specifically to trucks:

Goal 2: Multi-Modal

Policy 1. Develop and implement public street standards that recognize the multi-purpose nature of the street right-of-way for utility, pedestrian, bicycle, transit, truck and auto use.

Goal 6: Goods Movement

Policy 1. Design arterial routes, highway access and adjacent land uses in ways that facilitate the efficient movement of goods and services.

Policy 2. Require safe routing of hazardous materials consistent with federal and state guidelines.

These goals and policies are the criteria that all truck related improvements in Forest Grove should be measured against to determine if they conform to the intended vision of the City.

[12] *Draft Regional Transportation Plan*, Metro, Version 4.0, December 1, 1997.

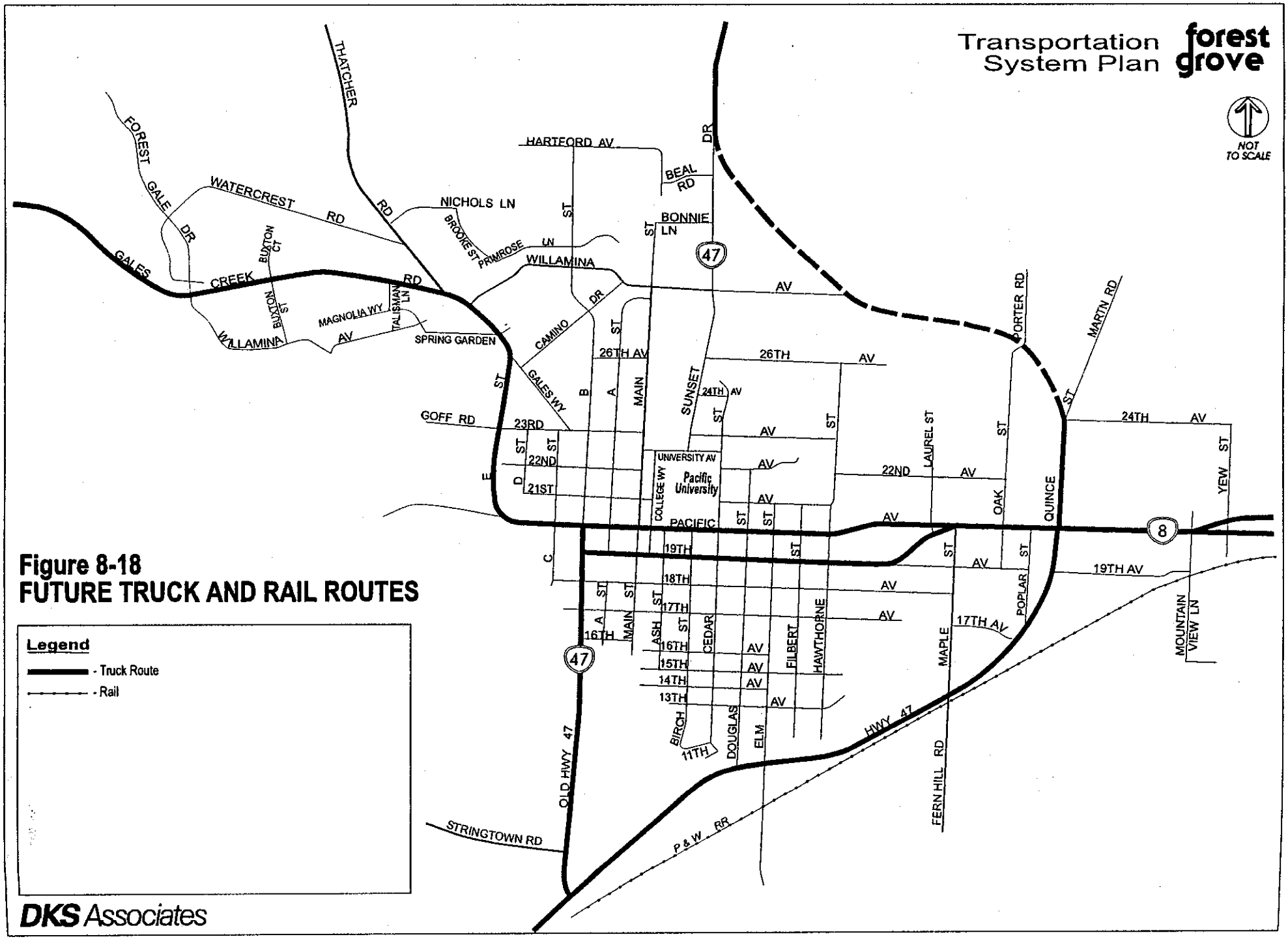


Figure 8-18
FUTURE TRUCK AND RAIL ROUTES

Chapter 9: Other Modes

This chapter summarizes existing and future rail, air, water and pipeline needs in the City of Forest Grove. While auto, transit, bicycle and pedestrian transportation modes have a more significant effect on the quality of life in Forest Grove, other modes of transportation must be considered and addressed.

Criteria

No goals or policies were developed related to rail, air, water or pipeline transportation systems.

Recommended Facilities

Rail

A northwest-southeast Union Pacific railroad link begins in Forest Grove (near 21st Avenue and Douglas Street) and continues east along Highway 8. Trains run through Forest Grove at a rate of approximately one per hour in each direction. None of the railroad crossings are grade separated. No improvements or changes in rail service are planned at this time.

Air

There are no airports within the City of Forest Grove. Forest Grove is served by the Portland International Airport, located approximately 10 miles to the east in Northeast Portland on the Columbia River. Forest Grove is also served by the Hillsboro Airport, a general aviation facility located on the northern edge of Hillsboro. No airports are expected within the City in the future. Therefore, no policies or recommendations in this area of transportation are provided for Forest Grove.

Water

There are no navigable waters within Forest Grove, therefore, no policies or recommendations in this area of transportation are provided.

Pipeline

The only major pipeline facilities running through the Forest Grove area is a high-pressure natural gas feeder line owned and operated by Northwest Natural Gas Company. The feeder line route enters Forest Grove along Porter Road/Oak Street and ends just north of Highway 8. No

future pipelines are expected within the City. No policies or recommendations in this area of transportation are provided for Forest Grove.

Chapter 10: Funding & Implementation

This chapter outlines the funding sources which can be used to meet the needs of the transportation system. The costs for the elements of the transportation system plan are outlined and compared to the potential revenue sources. Options are discussed regarding how costs of the plan and revenues can be balanced.

Transportation funding is commonly viewed as a user fee system where the users of the system pay for infrastructure through motor vehicle fees (such as gas tax and registration fees) or transit fares. However, a great share of motor vehicle user fees goes to road maintenance, operation and preservation of the system rather than construction of new system capacity. Much of what the public views as new construction is commonly funded (partially or fully) through property tax levies, traffic impact fees and fronting improvements to land development.

The overall transportation system needs can typically outpace dedicated funding sources. A key to balancing needs and funding are user fees. Motor vehicle fees have become a limited source of funding new transportation system capacity due to many factors:

- Gas taxes have been applied on a fixed cents per gallon basis not a percentage basis. Increases in the gasoline tax have not kept pace with cost of transportation needs. The Department of Transportation's Bureau of Transportation Statistics data indicates that in real terms the amount of federal gas tax paid by American households has actually declined by 41 percent from 1965 (when Interstate freeway building was at its peak) to 1995. That occurred with the real dollar gas tax increasing from 4 cents to 18.4 cents in the same time frame (although 4.3 cents per gallon were added for deficit reduction, not transportation, in the last ten years).
- Oregon gas taxes have not increased since 1992 (currently 24 cents per gallon) and registration fees have been at $15 per vehicle per year for over ten years. Significant new roadway construction, particularly that attributed to new development, has increased Forest Grove's inventory of roads and maintenance during this time. Additionally, the demands of region-wide growth have increased the need for capacity improvements in the system.
- Significant improvements in fuel economy over the last 15 years have reduced the relationship of user fees to actual use. For example, a passenger car with 12,000 miles of use in a year at 15 miles per gallon could generate about $350 per year in revenue using current federal, state and county gas tax levels (about 44 cents) compared to less than $200 per year with a 27 miles per gallon vehicle (a 45 percent reduction).

- The bill is coming due on many roads built 20 years ago in terms of maintenance. As the inventory of roads increased, the use of the roads increased faster. This is evident from national transportation statistics. The number of passenger cars and miles of urban roadways doubled from 1960 to 1995. However, the number of vehicle miles traveled on those roadways increased 470%. This increased use proportionally increases maintenance needs. Many of these roads are heavily used and the maintenance activities in the urban area have a substantial impact on operation unless work is conducted in off-peak periods, which increases the cost to maintain these roads. To compound matters, the amount of passenger car fuel consumed from 1960 to 1995 has only increased 66%, reducing the rate that revenue comes in from user fees relative to actual use.

Funding

Funding Sources and Opportunities

There are several potential funding sources for transportation improvements. Table 10-1 summarizes several funding options available for transportation improvements. These are sources which have been used in the past by agencies in Oregon. In most cases these funding sources when used collectively are sufficient to fund transportation improvements for local communities. Due to the complexity of today's transportation projects, it is necessary to seek several avenues of funding projects. Unique or hybrid funding of projects generally will include these funding sources combined in a new package. Examples of funding sources which generally do not provide funding for roadways include: Property Tax General Funds, Car Rental Tax, Transient Lodging Tax, Business Income Tax, Business License Tax and Communication Services Tax.

The federal gas tax is allocated through Intermodal Surface Transportation Efficiency Act (ISTEA). The United States Congress has approved reauthorization of transportation funding (TEA 21) for the next six years. Federal transportation funds are distributed in the Portland region by Metro (hence the term "regional funds"). ISTEA/TEA 21 funds are much more flexible than state gas tax funds, with an emphasis on multi-modal projects. ISTEA/TEA 21 funds are allocated through several programs including the National Highway System (NHS), Surface Transportation Program (STP) and Congestion Mitigation and Air Quality (CMAQ) Improvement Programs. NHS funds focus on the interstate highway system and CMAQ funds are targeted for air quality non-attainment areas.

Within the Portland region, funding for major transportation projects often is brought to a vote of the public for approval. This is usually for a large project or list of projects. Examples of this public funding includes the Major Streets Transportation Improvement Program (MSTIP) in Washington County or the Westside Light Rail Project. Because of the need to gain public approval for transportation funding, it is important to develop a consensus in the community which supports needed transportation improvements. That is the value of the Transportation System Plan. In most communities where time is taken to build a consensus regarding a transportation plan, funding sources can be developed to meet the needs of the community.

Table 10-1: Potential Transportation Revenue Sources

Type	*Description*
Traffic Impact Fees (TIF) & System Development Charges (SDC)	Traffic Impact Fees or System Development Charges (SDCs) have been used in Oregon and throughout the United States. The cornerstone to development of TIF/SDCs involves two principles: 1) there must be a reasonable connection between growth generated by development and the facilities constructed to serve that growth (generally determined by level of service or connectivity); and 2) there must be a general system-wide connection between the fees collected from the development and the benefits development receives. Charges are typically developed based on a measurement of the demand that new development places on the street system and the capital costs required to meet that demand.
Gas Tax	The State, cities and counties provide their basic roadway funding through a tax placed on gasoline. State gas tax is approved legislatively while voters approve local gas taxes. State funds are dedicated to roadway construction and maintenance, with one percent allocated to pedestrian and bicycle needs. This tax does not fall under the Measure 5 limits, because it is a pay-as-you-go user tax. Washington County has a three cent gas tax.
Other Motor Vehicle Fees	The state collects truck weight mile taxes, vehicle registration fees and license fees. These funds are pooled together with the gas tax in distributing state motor vehicle fees to local agencies. Annual motor vehicle fee allocations to Forest Grove (including the County gas tax revenue) amount to about $770,000.
Street Utility Fees	Certain cities have used street utility fees for maintenance. The fees are typically collected monthly with water or sewer bills. These funds are not for capacity improvements, but for supporting local roadway maintenance based upon land use type and trip generation. This frees other revenue sources for capacity needs. Utility fees can be vulnerable to Measure 5 limitations, unless they include provisions for property owners to reduce or eliminate charges based on actual use.
Exactions	Frontage improvements are common examples of exaction costs passed to developers. These have been used to build much of Forest Grove's local street system. Developers of sites adjacent to unimproved roadway frontage are responsible for providing those roadway improvements. Developers of sites adjacent to improvements identified as TIF/SDC projects can be credited the value of their frontage work. which is included in the TIF/SDC project-list cost estimate.
Local Improvement Districts (LID)	LIDs provide a means for funding specific improvements that benefit a specific group of property owners. Assessments are placed against benefiting properties to pay for improvements. LIDs can be matched against other funds where a project has system wide benefit beyond benefiting the adjacent properties. Similarly, districts can be created for tax increment type financing. A variation of LID can be Reimbursement Agreements or late comers agreements where one private individual/firm builds a road for common use by others and as they develop they reimburse the builder.
Special Assessments	A variety of special assessments are available in Oregon to defray costs of sidewalks, curbs, gutters, street lighting, parking and CBD or commercial zone transportation improvements. These assessments would likely fall within the Measure 50 limitations. A regional example would be the Westside LRT where the local share of funding was voter approved as an

Type	*Description*
	addition to property tax.
Driveway Fees	Gresham collects a Public Street Charge and a Driveway Approach Permit Fee. These fees are project specific and revenue varies year to year based upon development permits. These funds are used for city maintenance and operation. This is not done in Forest Grove.
Employment Taxes	Tri-Met collects a tax for transit operations in the Portland region through payroll and self employment taxes. Approximately $120 million are collected annually in the Portland region for transit.
Oregon Special Public Works Fund	The Special Public Works Fund (SPWF) Program was created by the legislature in 1985 as an economic development element of the Oregon Lottery. The program provides grants and loan assistance to eligible municipalities. There has been limited use of these funds on urban arterials. These funds are commonly used on state highways.

Costs

Cost estimates (general order of magnitude) were developed for the projects identified in the motor vehicle, bicycle and pedestrian elements. Costs estimates from the RTP projects in Forest Grove were used in this study. Other projects were estimated using general unit costs for transportation improvements, but do not reflect the unique project costs that can (on some projects due to right-of-way, environmental mitigation and/or utilities) significantly add to project cost (25 to 75 percent in some cases). Development of more detailed project costs can be prepared in the future with more refined financial analysis. Since many of the projects overlap elements of various modes, the costs were developed at a project level incorporating all modes, as appropriate. It may be desirable to break project mode elements out separately, however, in most cases, there are greater cost efficiencies of undertaking a combined, overall project. Each of these project costs will need further refinement to detail right-of-way requirements and costs associated with special design details as projects are pursued. Table 10-2 summarizes the elements of the plan which were not project specific and how costs will be addressed for these elements.

It should be noted that all costs are 1999 based. Using the Engineering News Record[1] research on historical construction costs, it can be anticipated that (based on the past ten years) construction costs will increase about 2.5-2.75 percent per year. Since 1979, construction costs have increased 100 percent over 20 years.

Tables 10-3, 10-4 and 10-5 summarize the key projects in the TSP by three key groups including:

- Bicycle Improvements
- Pedestrian Improvements
- Motor Vehicle Improvements

Many of the project costs have been developed by Washington County, Metro or ODOT for projects in the RTP. These project costs have been utilized for the purposes of this TSP.

[1] Engineering News Record, construction cost index data, enr.com.

Table 10-2: Issues With Non-Auto, Pedestrian and Bicycle Costs

Mode	*Issues*
Parking	The TSP does not define specific projects. Off-street parking will be provided by private property owners as land develops.
Neighborhood Traffic Management	Specific NTM projects are not defined. These projects will be subject to neighborhood consensus based upon City of Forest Grove placement and design criteria. A city NTM program, if desired, should be developed with criteria and policy adopted by the City Council. Traffic humps can cost $2,000 to $4,000 each and traffic circles can cost $3,000 to $8,000 each. A speed trailer can cost about $10,000. It is important, where appropriate, that any new development incorporate elements of NTM as part of its on-site design. The City currently has no allocation for NTM in the 1999-00 budget.
Public Transportation	Tri-Met will continue to develop costs for implementing transit related improvements. The City can supplement this by incorporating transit features through development exactions and roadway project design. Developing new transit services in Forest Grove similar to the corridor services outlined in the TSP will require Tri-Met to reallocate funding or seek additional sources of operating funds.
Trucks/Freight	Roadway funding will address these needs. Roadway under-crossings of railroads can use special Public Utilities Commission funds set aside for safety improvements to railroad crossings.
Rail	Costs to be addressed and funded by private railroad companies and the state.
Air, Water, Pipeline	Not required by City.
Transportation Demand Management	DEQ has established regional guidelines. Private business will need to support employee trip reduction programs. Conditions of land use approval for employers of 50 or more people should include a condition requiring TDM, as required by DEQ regionally.

Table 10-3: Pedestrian Action Plan Project List

Project	*From*	*To*	*Approximate Cost*
B Street	26th Avenue	Willamina Avenue	$ 585,000
College Way	Pacific Avenue	21st Avenue	100,000
University Avenue	Sunset Drive	Main Street	100,000
18th Avenue	Hawthorne Street	Maple Street	240,000
Bonnie Lane Path	Gales Creek Road	N-S Collector	31,250
Willamina	Gales Creek Road	Main Street	31,250
Hawthorne Street	South End	Hwy. 47 Bypass	156,250
Cedar Street	South End	Hwy. 47 Bypass	175,000
19th Avenue	Hawthorne Street	Ballad Town Shops	142,500
23rd Avenue	Cedar Street	Hawthorne Street	225,000
Lincoln Park Trails	University Avenue	N/o 26th Avenue	500,000
		Pedestrian Action Plan Total Cost:	**$2,287,250**

Table 10-4: Bicycle Action Plan Project List

Project	*From*	*To*	*Approximate Cost*
19th Avenue	B Street	Ballad Town Shops	$ 35,000
Pacific Avenue	E Street	Hawthorne Street	34,375
Sunset Drive	University Avenue	Hwy. 47 Bypass	750,000
College Way	Pacific Avenue	University Avenue	7,500
Hwy. 47 North Bypass	TV Highway	North city limit	1,500,000
		Bicycle Action Plan Projects Total Cost:	**$2,327,875**

Table 10-5: Motor Vehicle Project List

Location	*Description*	*Funding Status**	*Cost*
23rd/24th Avenue	Construct collector level roadway between Hawthorne Avenue and Quince Street	Planned	$ 2,280,000
26th Avenue	Extend from terminus east of Sunset Drive to Oak Street	Planned	1,200,000
B Street **	North extension from Hartford Avenue to David Hill Road	Not Planned	2,484,000
College Way	Close between 21st Avenue and Pacific Avenue to through vehicle traffic.	Not Planned	200,000
Council Street	Convert to two-way traffic flow. Modify traffic signal with Pacific Avenue.	Not Planned	100,000
David Hill Road **	Extend easterly from Thatcher Road to Sunset Drive (Highway 47) as a two-lane collector facility with left-turn lanes at major intersections.	Not Planned	5,472,000
Forest Gale Drive	Extend northeasterly to connect to David Hill Road	Planned	2,214,000
Goff Road	Extend westerly as a collector facility to connect to Willamina Avenue near Ballad Way	Planned	1,248,000
Hartford Avenue	Extend westerly as a collector facility to connect to Thatcher Road	Planned	1,440,000
Hawthorne Street	Extend northerly to intersect Northern Highway 47 Bypass. Re-align Willamina Avenue to provide adequate intersection spacing.	Planned	720,000
Heather Street	Extend easterly from existing terminus to connect to Heather Street in the City of Cornelius	Planned	384,000
Laurel Street	Upgrade to collector standards and extend northerly to 26th Avenue	Not Planned	1,743,000
Main Street	Extend through wetland area north of Willamina Avenue to connect past Bonnie Lane	Planned (City)	720,000
Main Street **	Extend north of Hartford Road to future David Hill Road	Not Planned	984,000
Sunset Drive	Upgrade to collector standards from University to Beal	Planned (MSTIP)	5,700,000
Thatcher Road	Re-align Thatcher Road at its intersection with Gales Creek Road to eliminate substandard angles and improve intersection spacing.	Not Planned	1,230,000
Yew to Holladay Connector	Construct east-west industrial collector from Yew Street to connect to Holladay in Cornelius.	Planned	1,180,000
	Motor Vehicle Street Improvement Total Cost		**$ 29,399,000**

* Planned indicates projects included in the Metro RTP, Washington County CIP or City CIP. Not in Plans indicates projects that have not be previously addressed in one of the local or regional transportation improvement plans. Existing planned improvements may have fronting developable property that would lessen the cost burden to the city (see Appendix).

** These improvements require either an amendment to the Urban Growth Boundary or an exception to Transporation Plan Rules (OAR 660-12-070) pertaining to urban road facilities on rural lands.

Table 10-6: Future Intersection Improvements

No.	Intersection	Description*	Approximate Cost
1	TV Highway/Quince Street	Turn lanes, modify traffic signal	$800,000
2	Highway 47/Elm Street	Traffic signal	200,000
3	Highway 47/Maple Street	Traffic signal	200,000
4	Sunset Drive/Willamina Avenue	Turn lanes, traffic signal OR roundabout	400,000
5	Highway 47/David Hill Road	Turn lanes, traffic signal	400,000
6	Traffic Signal Preemption	Install emergency vehicle preemption (13)	200,000
		Intersection Improvement Total	**$2,200,000**

Implementation Issues

The proposed David Hill Road extension from Thatcher Road to Highway 47 and the connecting north/south road extensions occurs on Exclusive Farm Use lands outside of the Urban Growth Boundary. This is very significant fact for the process required to implement these proposed plan amendments because it requires approval and plan modifications from other agencies outside of the city including Washington County, Metro and the Oregon Department of Land Conversation and Development. The most direct approach to accomplishing these transportation facility additions is to amend the Urban Growth Boundary to include the effected rural lands. One possible alternative would transfer the urban land north of the proposed alignment from Thatcher Road to just east of Brooke Street for the rural land south of the alignment from that point east to Highway 47.

However, if the urban boundary remains in its present location, the addition of rural transportation facilities to serve the urban plan area falls under the provisions of Transportation Planning Rule 660-12-065. The major elements that apply to this facility appear to include the following (Sections 5, 6 and 7):

- Consider alternative alignments that do not impact EFU or forest lands
- Demonstrate that the proposed alignment effectively reduces in peak hour travel time as defined by OAR 660-012-0035 (10) relatively to the urban alternative. The cited section notes a minimum reduction of 15% over the length of the route compared to the urban alternative.

If these provisions cannot be met, and exception of the above rule is required as specified in OAR 660-012-0070 that involves a rigorous evaluation of the essential need for the exception relative to an urban alternative. These important procedural steps are preferred to be resolved prior to the adoption of the city Transportation System Plan, but are mandated before any road improvements to these facilities can be initiated.

Financing Issues

The collective funding requirements of the Forest Grove TSP is outlined by mode in Table 10-7. Based upon current sources of funding, the cost of the needs far exceeds the existing funding projected over the next 20 years. It should be noted that elements of the bicycle and pedestrian project lists which are redundant to the street improvement list were deducted to avoid double counting. A major portion of this difference can be made up by land use development exaction, where unimproved frontage is built to the TSP standards as projects are implemented. Since a significant number of the transportation projects directly serve new development of vacant land, it can be assumed that fronting improvements would be a means to implement many of the projects with these characteristics. However, many of the street improvements are not on unimproved frontage or have minor lots adjacent to them. The magnitude of the fronting improvements is such that the City and County will need to develop private/public partnerships to assure the reasonable delivery of future improvements in a timely manner.

Table 10-7: Costs for Forest Grove Transportation Plan over 20 years (1999 dollars)

	Transportation Element	*Approximate Cost*
1.	Street Improvement Projects *	$29,399,000
	Current Plan	$17,086,000
	Fronting Improvement (Current and Proposed)	$16,873,000
	Unfunded, Not in Plans, and No Fronting Improvements	$12,526,000
2.	Intersection Improvements	$2,200,000
3.	Road Maintenance (assumes 4% per year growth)	$8,000,000
	Bicycle Action Plan (Included in Street Projects) **	$2,328,000
	Pedestrian Action Plan (Included in Street Projects) **	$2,287,000
4.	Neighborhood Traffic Management ($10,000/yr)	$200,000
TWENTY YEAR TOTAL in 1999 Dollars (Items 1 through 4)		**$39,799,000**

* Many of these projects include multi-modal elements built with streets, such as bike lanes and sidewalks. Bicycle and pedestrian costs are shown for information only, and are included in the multi-modal street improvement costs. While projects in the RTP do not have committed funds, they represent a level of funding that is considered likely over the next 20 years given current funding sources.

** These projects are included in the Street Improvements category as multi-modal projects and are, therefore, not included separately in the 20 year total.

The funding sources which can be used for various modes of transportation are summarized in Table 10-8. Historically, funding sources have been developed to support roadways for automobiles. Few funding sources have been allocated to other travel modes. Other travel modes were commonly implemented as an element of a roadway project, if funded at all. One funding source that the City receives for other modes include an allocation of the state motor vehicle fees which come to the City being dedicated to pedestrian/bicycle facilities. While federal gas tax funds are specifically allocated to multi-modal and balanced investments in transportation, other sources of funds such as state gas tax cannot be used for anything but highway use. To address these other modes, the City will need to specifically seek funds for a balanced transportation system, while managing the overall needs and revenues.

Table 10-8: Funding Source by Project Type

Source	Bicycle	Ped.	Streets	Maint.	Transit
Traffic Impact Fee (TIF)	●	●	✓		
System Development Charges (SDC)					
Gas Tax/Motor Vehicle Fees					
State	●	●	✓	✓	
Federal	✓	✓	✓	✓	✓
Street Utility Fees				✓	
Exaction's	●	✓	✓		
Local Improvement Districts (LID)	●	●	✓		
Tax Increment Financing	✓	✓	✓		
Special Assessments		●	✓	✓	✓
Driveway Fees			✓	✓	
Payroll Employee Tax					✓
Oregon Special Public Works Fund	●	●	✓		✓

● Typically as part of roadway project where other modes are incorporated

✓ Used as a primary source of funding

Current transportation revenue for the City of Forest Grove can be summarized as noted in Table 10-9. Presuming a constant funding level for 20 years, this would potentially fund about $15,400,000 of transportation projects (mostly maintenance and operation). As a comparison to this number, the amount of regional funding allocated to transportation projects in Forest Grove was calculated using the RTP constrained funding scenario. Approximately $6 million in transportation projects have been identified in the current funding programs.[2] This clearly points out that there is a serious shortfall between the cost of the transportation plan and the current funding sources. The transportation plan costs of $40 million are much greater than the best case revenue scenario of about $21 million using existing funding sources. Another $9 million in road construction would be provided by development frontage road projects. This leaves a funding shortfall of about $10 million.

[2] Regional Transportation Plan Project List, Round 3, Metro, July, 1999.

Table 10-9: Estimated Transportation Funding from Existing Sources (1999 dollars)

Source	*Approximate Annual Revenue*
State Motor Vehicle Fees/County Gas Tax to City	$770,000
ANNUAL TOTAL	$770,000
20 YEARS OF CURRENT FUNDING	$15,400,000
Currently Planned Street Improvement Projects	$5,700,000
Fronting Improvements	$8,500,000
Total Available Over 20 Years	29,600,000

Appendix

Appendix A: TPR Analysis

MEMORANDUM

Date: June 4, 1999

To: Carl Springer

From: Jason Franklin, Pacific Rim Resources

RE: Transportation Planning Rule (TPR) Analysis

This memo describes the requirements of Oregon's Transportation Planning Rule (TPR), specifically Section 660-12-045—*Implementation of the Transportation System Plan* (TSP). It also describes Forest Grove's existing policies, standards and plans that are designed to meet the TPR requirements, and it identifies policy inconsistencies or changes needed to address the TPR.

A major goal of the TPR is reducing reliance on the automobile and encouraging pedestrian, bicycle, and transit facilities as part of a multi-modal transportation system. For MPO areas, the TPR establishes three objectives for reducing automobile vehicle miles traveled (VMT) per capita:

1. No increase within 10 years
2. A 10 percent reduction in 20 years
3. A 20 percent reduction in 30 years.

These objectives are to be achieved by increasing the share of non-automobile trips (pedestrian, bicycle or transit), reducing the number of single occupant vehicle trips, increasing average vehicle occupancy, or reducing the number of trips and/or length of trips required through more intensive land use and/or a better mix of land uses.

Table 1 cross-references TPR requirements and Forest Grove's code provisions. Each section is described below.

Note: The Forest Grove Zoning Ordinance used for this analysis is dated June, 1998.

TABLE 1.
TPR IMPLEMENTATION MEASURES

Issue	TPR Citation	Forest Grove Comprehensive Plan and Zoning Ordinance
Land Use Approvals for Transportation Projects	045 (1)	None
Access Control	045 (2) (a)	TSP Policies
Protecting Future Operations	045 (2) (b)	9.855(3)
Airports	045 (2) (c)	Not Applicable
Coordinated Review	045 (2) (d)	Limited 9.830(10)
Conditions of Approval	045 (2) (e)	9.855(3)
Notification	045 (2) (f)	9.815 (2) and 9.830(10)
Consistency with TSP	045 (2) (g)	Land Division Ordinance 9.118(7)(c)
Bicycle Parking	045 (3) (a)	9.823(5)
Pedestrian and Bicycle Facilities	045 (3) (b)	Land division Ordinances 9.110(2)(b)(i) and 9.110(2)(b)(ii)
Off-site Improvements	045 (3) (c)	9.830(5)
Internal Pedestrian Circulation	045 (3) (e)	9.830(6-9) and 9.820(4)
Design Support for Transit Routes	045 (4) (a) and (5) (d)	9.823 (1)(a)(ii) and 9.830 (10) and CP Section XI Policy #6, 17, 19
Transit Access	045 (4) (b, e, and f)	ZO 9.823 (1)(a)(ii) and 9.830(10) CP Section XI #17, 19
Preferential Carpool Parking	045 (4) (d)	9.821(6)
Transit Oriented Development	045 (4) (g) and (5) (a)	9.700
Demand Management Program	045 (5) (b)	TSP Policies
Parking Plan	045 (5) (c)	9.823 (1)(a)(i)
Pedestrian and Bicycle Plan for Developed Areas	045 (6)	TSP
Street Standards	045 (7)	TSP

Land Use Approvals for Transportation Projects
The TPR [660-12-045(1)] requires that local governments amend their land use regulations to implement their adopted TSP and to clarify the land use approval process for transportation-related projects. Forest Grove does not specifically identify transportation projects as permitted or conditional uses in its zoning. Each zone should show transportation improvements as per shown in the TSP as an allowed use. Additional provisions for transportation projects not in the TSP could be made with the development of corresponding criteria.

The following language is suggested to be added to each development zone as an allowed use:

Construction of new streets and roads, including the extensions of existing streets and roads, that are included within the adopted Transportation System Plan.

Protecting The Existing and Future Operation of Facilities

Access Control
The TPR [660-12-045(2)(a)] requires local governments to adopt access control measures, such as driveway and public road spacing, median control, and signal spacing standards, that are consistent with the functional classification of roads. The Forest Grove Land Division Ordinance currently has a section on access to local streets [9.110(1)k] which alludes to access control as outlined in the TPR. A new subsection should be added that refers to the access control/management policies found in the Transportation Element (TSP).

The following language is suggested:

l. Access Control: Access control, as described for each classification of street within the Transportation Element (TSP), shall be implemented when a new street or street extension is built.

Protecting Future Operations
The TPR [660-12-045(2)(b)] requires local governments to adopt standards to protect future operation of roads, transit ways and major transit corridors. Forest Grove's Zoning Ordinance addresses this requirement in code 9.855(3-4). However, there is no reference to a level of service requirement as determined by the TSP.

The following language is suggested to be added to 9.855(4)(b) - insert after second sentence:

In addition, the traffic impact analysis will specify whether the new development will cause the volume/capacity ratio (level of service) of the road, as set forth in the Transportation Element (TSP), to be exceeded.

Airports
The TPR [660-12-045(2)(c)] requires local governments to adopt measures to control land uses within airport noise corridors and imaginary surfaces. This provision does not apply since there is no airport within the urban area of Forest Grove or any airport overlay zone.

Process for Coordinated Review of Land Use Decisions

Coordinated Review
The TPR [660-12-045(2)(d)] requires local governments to create a process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites. Forest Grove's Zoning Ordinance does not appear to address coordinated review. This deficiency is being addressed through the larger code rewrite project.

Conditions of Approval
The TPR [660-12-045(2)(e)] requires local governments to adopt land use regulations that create a process for applying conditions to development proposals to minimize impacts and protect transportation facilities, corridors, or sites. Forest Grove's Zoning Ordinance 9.855(3) acknowledges conditions of approval.

Notification
The TPR [660-12-045(2)(f)] requires regulations calling for notification of the following to public agencies providing transportation facilities and services, MPOs and the Oregon Department of Transportation (ODOT):

- Land use applications that require public hearings
- Subdivision and partition applications
- Other applications that affect private access to roads
- Other applications within airport noise corridors and imaginary surfaces that affect airport operations.

The existing notification procedures, zoning code 9.915(1), are limited to placement of a newspaper ad and local postings and notification to Tri-Met when 19th Avenue or Pacific Avenue are affected [9.830(10)]. This section should be expanded to include notification to ODOT when a state highway is impacted. Completed as part of larger code rewrite project.

Consistency with TSP
The TPR [660-12-045(2)(g)] requires regulations assuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities and levels of service of facilities identified in the TSP. The purpose of this requirement is to ensure that a comprehensive plan amendment, zoning ordinance amendment or zone change considers the impact on traffic and is consistent with the TSP. Forest Grove's Land Division Ordinance 9.118(7)(c) addresses amendments to land use designations, but does not require it to be consistent with the TSP.

Safe and Convenient Pedestrian and Bicycle Circulation

Bicycle Parking
The TPR [660-12-045(3)(a)] requires bicycle parking facilities as part of the multi-family residential units of four units or more, new retail, office or institutional developments, and all transit transfer stations and park and ride lots. The zoning ordinance 9.823(5) addresses bicycle parking standards.

Pedestrian and Bicycle Facilities
The TPR [660-12-045(3)(b)] requires on-site facilities that accommodate safe and convenient pedestrian and bicycle access from within new subdivisions, multi-family developments, planned developments, shopping centers, and commercial districts to

adjacent residential areas and transit stops, and to neighborhood activity centers within a half mile of the development. The TPR also provides that single-family residential developments shall generally include streets and access ways; and that pedestrian circulation through parking lots should generally be provided in the form of accessways.

"Safe and convenient" means that the bicycle and pedestrian routes, facilities and improvements have all the following characteristics:

- They are reasonably free from hazards, particularly types or levels of automobile traffic that would interfere with or discourage pedestrian or cycle travel for short trips.
- They provide a reasonably direct route of travel between destinations, such as between a transit stop and a store.
- They meet the travel needs of cyclists and pedestrians considering destination and length of trip; and considering that the optimum trip length of pedestrians is generally a quarter to half mile. [660-12-045(3)(d)]

Forest Grove addressed this requirement in land division 9.110(2)(b)(i) and 9.110(2)(b)(ii).

Off-site Improvements
The TPR [660-12-045(3)(c)] requires that off-site improvements that are required as a condition of approval include pedestrian and bicycle improvements, including bicycle ways along arterials and major collectors. Forest Grove's zoning ordinance 9.830(5) requires off-site improvements to connect adjoining developments.

Internal Pedestrian Circulation
The TPR [660-12-045(3)(e)] requires internal pedestrian circulation within new office parks and commercial developments to be provided through clustering of buildings, construction of accessways, walkways and similar techniques. Forest Grove's zoning ordinance 9.830(6-9) and 9.820(4) adequately addresses this requirement.

Transit Access and Facilities

For urban areas where the area is already served by a public transit system, the TPR [660-12-045(4)] requires support of transit by requiring land use regulations for the following:

- Transit routes and facilities shall be supported through appropriate measures such as bus stops, pullouts, optimum road geometrics, or parking restrictions.
- New retail, office and institutional developments should include transit routes and facilities and convenient pedestrian access to transit through walkways and connections.
- Designate pedestrian districts for areas planned for a mix of uses likely to support a relatively high level of pedestrian activity.

- Allow existing developments to redevelop portions of parking areas for transit oriented uses where appropriate.
- Ensure that new roads can be adequately served by transit.
- Designate transit supportive land uses along existing or planned transit routes.

Forest Grove's zoning ordinance 9.823(1)(a)(ii) and 9.830(10) as well as the comprehensive plan section XI, policies 6, 17 and 19 adequately address design support for transit routes

Other TPR Provisions

Preferential Carpool Parking
The TPR [660-12-045(4)(d)] requires that designated employee parking areas in new developments shall provide preferential parking for carpools and vanpools. Forest Grove zoning ordinance 9.821(6) adequately acknowledges this requirement.

Transit Oriented Development
The TPR [660-12045(5)(a)] requires local governments to adopt land use and subdivision regulations that allow transit-oriented development on lands along transit routes. "Transit oriented development" is defined as a mix of residential, retail and office uses and a supporting network of roads, bicycle and pedestrian facilities focused on a major transit stop. A key component is high-density residential development close to a transit stop with supporting neighborhood commercial uses. Forest Grove's Community Commercial Zone (9.700) fills the transit oriented development requirement. The code states "The Community Commercial Zone is intended to promote a concentration of mixed uses...located along the regional transit system...and makes progress in reducing traffic congestion...are designed to encourage convenient alternatives to the auto."

Demand Management Program
The TPR [660-12-045(5)(b)] requires local governments to implement a demand management program to meet the VMT reduction standards. Demand management programs are designed to change travel behavior in order to improve the performance of transportation facilities and reduce the need for additional road capacity. Possible actions include, but are not limited to, promoting the use of alternative modes, ride-sharing and vanpool programs, and trip-reduction ordinances. Forest Grove does not currently have a demand management program, and this requirement should be addressed in the Urban TSP.

Parking Plan
The TPR [660-12-045(5)(c)] requires local governments to implement a parking plan that does all of the following:

- Achieves a 10 percent reduction in the number of parking spaces per capita in the Metropolitan Planning Organization area

- Aids in meeting the VMT reduction standards
- Sets minimum and maximum parking requirements.

The reduction in parking spaces may be accomplished through a combination of restrictions on new developments and requirements to redevelop existing spaces into other uses. Forest Grove currently has standards in place to reduce off-street parking. Zoning ordinance 9.823(a)(i) requires a parking space demand study. The ordinance does not consider reducing the VMT, but does give minimum parking standards. Forest Grove should address these objectives as part of its effort to incorporate the parking standards in Metro's Urban Growth Management Function Plan into its zoning code.

Pedestrian and Bicycle Plan for Developed Areas

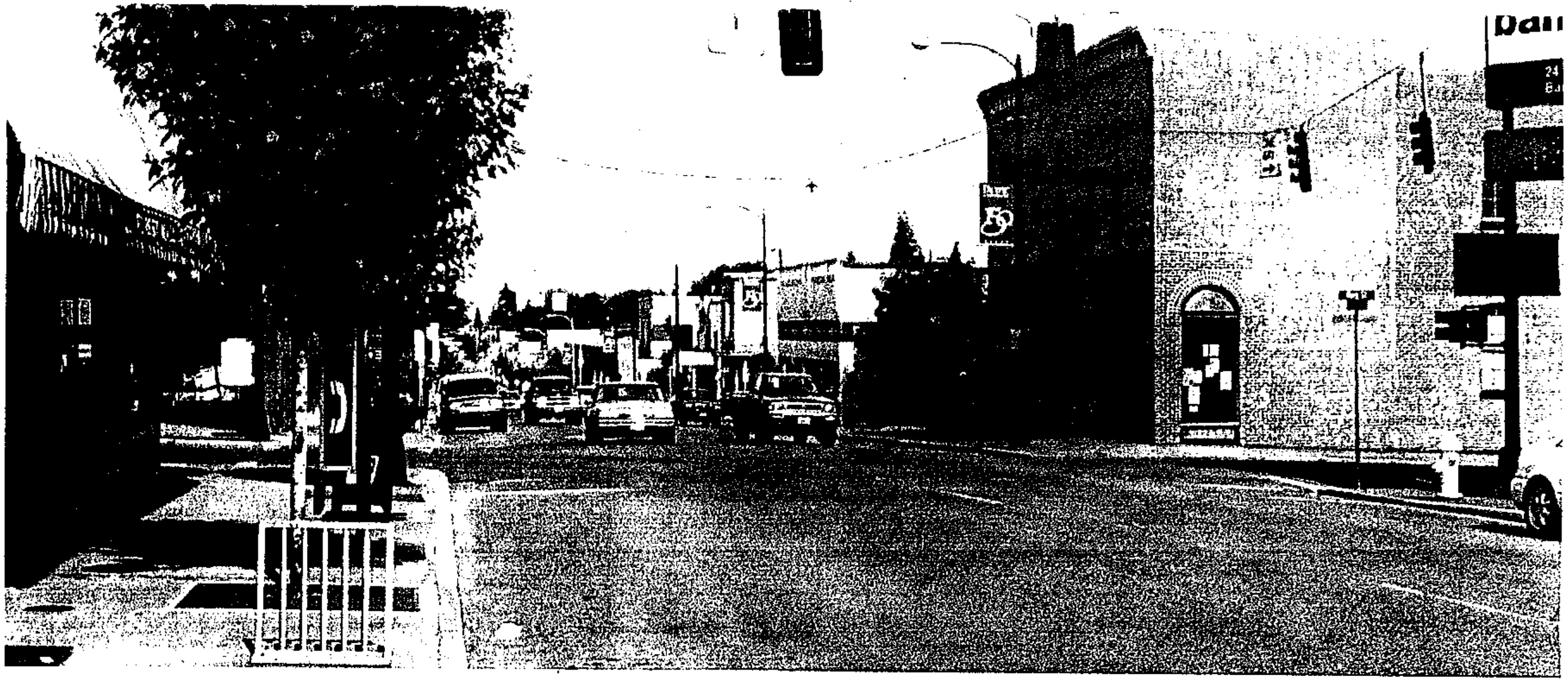
The TPR [660-045(6)] requires local governments to identify appropriate pedestrian and bicycle improvements in developed areas to provide for more direct, convenient and safer travel within and between residential areas and neighborhood activity centers (schools, parks, shopping areas). Pedestrian and Bicycle Plan for Developed Areas will be addressed in the TSP.

Street Standards

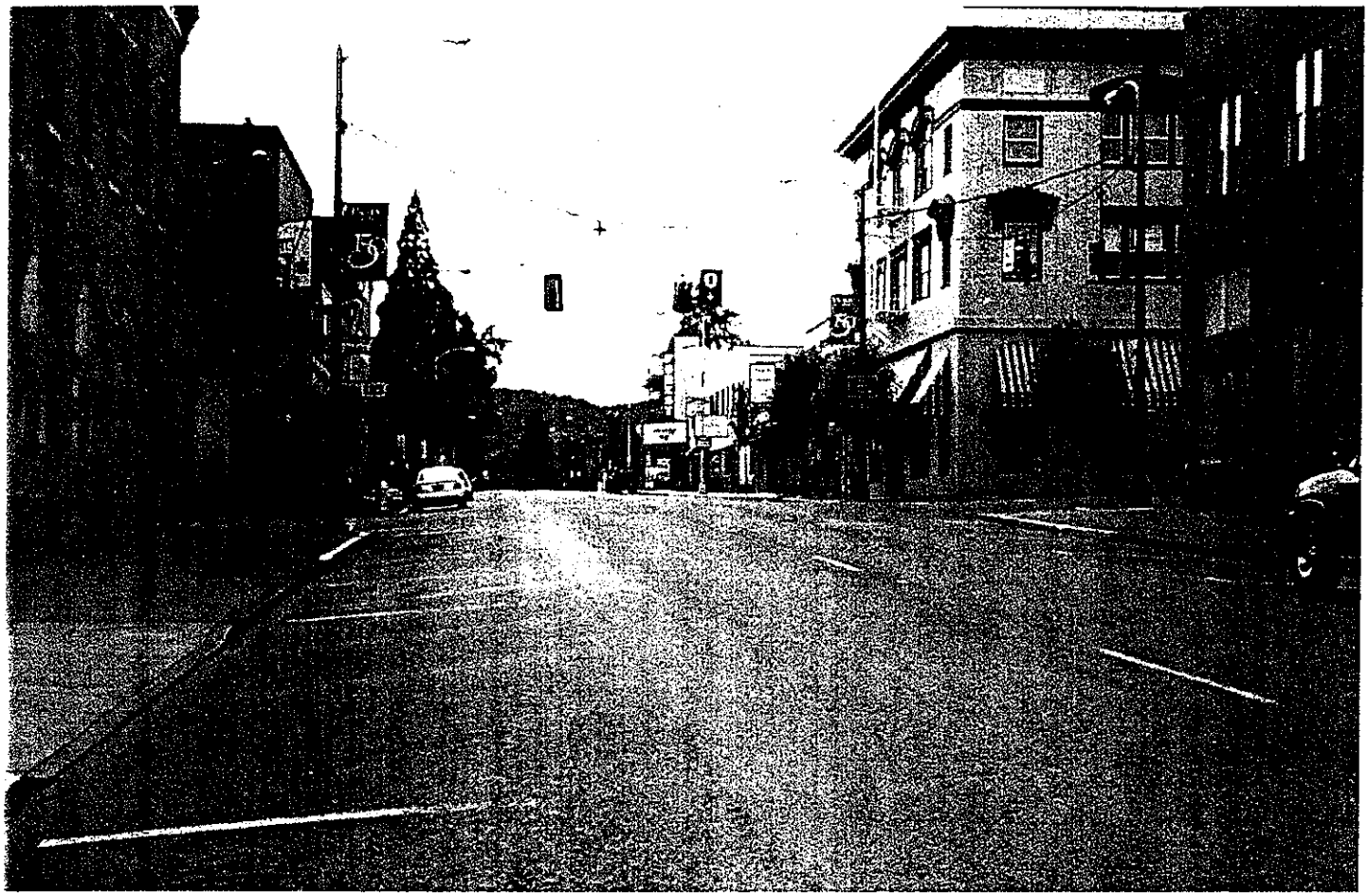
The TPR [660-12-045(7)] requires local governments to establish street standards that minimize pavement width and total right-of-way, consistent with the operational needs of the facility. The intent of this standard is to encourage local government to consider and reduce excessive standards in order to reduce construction costs, provide for more efficient use of urban land, provide emergency vehicle access while discouraging inappropriate traffic volumes and speeds, and accommodate convenient bicycle and pedestrian circulation. Street standards do not need to be adopted as land use regulations. Street Standards will be addressed in the TSP.

Appendix B: Visual Simulations

University Avenue Looking East



Pacific Ave. at Main St. Looking East



Pacific Ave. at Main St. Looking West

Pacific Ave. at College Way

Acknowledgement

Production of this report has been the collective effort of the following people:

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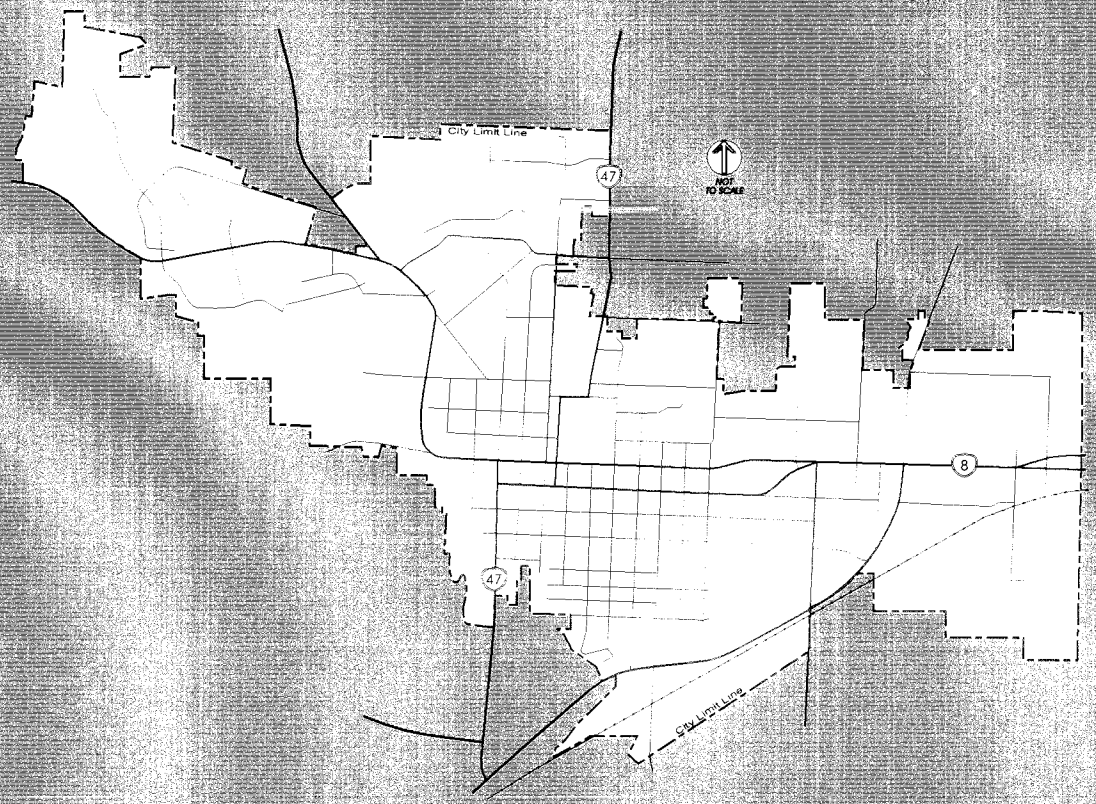
Technical Appendix



Prepared by

DKS Associates

July 1999

Level of Service Descriptions

Traffic Levels Of Service

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of level of service has been developed to subjectively describe traffic performance. Level of service can be measured at intersection and along key roadway segments.

Level of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Levels of Service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The *Highway Capacity Manual* provides level of service calculation methodology for both intersections and arterials.3 The following three sections provide interpretations of the analysis approaches.

3 *1994 Highway Capacity Manual*, Special Report 209, Transportation Research Board, Washington D.C., 1994, Chapters 9, 10 and 11.

All-Way Stop Controlled Intersections

Unsignalized intersections and all-way stop controlled intersections are each subject to a separate capacity analysis methodology. All-way stop controlled intersection operations are reported by leg of the intersection. This method was developed by Dr. Michael Kyte of the University of Idaho.4

This method calculates a delay value for each approach to the intersection. The following table describes the amount of delay associated with each level of service.

Table A1: All-Way STOP Controlled Intersection Level of Service Definition

Average Delay (Seconds)	*Level of Service*
≤ 5	A
6 – 10	B
11 – 20	C
21 – 30	D
31 – 45	E
> 45	F

4 *Transportation Research Circular #373*, Transportation Research Board.

Unsignalized Intersections (Two-Way Stop Controlled)

Unsignalized intersection level of service is reported for the major street and minor street (generally left turn movements). The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The 1994 Highway Capacity Manual describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

Table A2: Non-Signal Controlled Intersection Level of Service Definition

Level of Service	*Expected Delay*	*Avg. Total Delay (sec/veh)*
A	Little or no delay	≤ 5.0
B	Short traffic delay	5.1 – 10.0
C	Average traffic delays	10.1 – 20.0
D	Long traffic delays	20.1 – 30.0
E	Very long traffic delays	30.1 – 45.0
F	Extreme delays potentially affecting other traffic movements in the intersection	> 45

Source: *Highway Capacity Manual*, Special Report 209 (Third Edition), Transportation Research Board, Washington D.C., 1994.

Signalized Intersections

For signalized intersections, level of service is evaluated based upon average vehicle delay experienced by vehicles entering an intersection. As delay increases, the level of service decreases. Calculations for signalized and unsignalized intersections are different due to the variation in traffic control. The 1994 Highway Capacity Manual provides the basis for these calculations.

Table A3: Signal Controlled Intersection Level of Service Definition

Level of Service	*Vehicle Delay (secs)*	*Description*
A	≤ 5.00	**Free Flow/Insignificant Delays**: No approach phase is fully utilized by traffic and no vehicle waits longer than one red light indication. Most vehicles do not stop at all. Progression is extremely favorable and most vehicles arrive during the green phase.
B	5.1 – 15.0	**Stable Operation/Minimal Delays**: An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles. This level generally occurs with good progression, short cycle lengths, or both.
C	15.1 – 25.0	**Stable Operation/Acceptable Delays**: Major approach phases fully utilized. Most drivers feel somewhat restricted. Higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, and the number of vehicles stopping is significant.
D	25.1 – 40.0	**Approaching Unstable/Tolerable Delays**: The influence of congestion becomes more noticeable. Drivers may have to wait through more than one red signal indication. Longer delays may result from some combination of unfavorable progression, long cycle lengths or high v/c ratios. The proportion of vehicles not stopping declines and individual cycle failures are noticeable.
E	40.1 – 60.0	**Unstable Operation/Significant Delays**: Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence.
F	≥ 60.0	**Forced Flow/Excessive Delays**: Represents jammed conditions. Queues may block upstream intersections. This level occurs when arrival flow rates exceed intersection capacity, and its considered to be unacceptable to most drivers. Poor progression, long cycle lengths, and v/c ratios approaching 1.0 may contribute to these high delay levels.

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report No. 209 (Third Edition), Washington D.C.,

Level of Service Calculations

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #6 Elm St/19th Ave

Cycle (sec):	55	Critical Vol./Cap. (X):	0.650
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	6.2
Optimal Cycle:	39	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1	0	0 1	0 1	0	0 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	93	19	63	4	66	0	6	627	55	17	419	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	93	19	63	4	66	0	6	627	55	17	419	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	105	21	71	5	74	0	7	707	62	19	472	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	105	21	71	5	74	0	7	707	62	19	472	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	105	21	71	5	74	0	7	707	62	19	472	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.88	0.88	0.84	0.94	0.94	1.00	0.85	0.85	0.85	0.77	0.77	0.77
Lanes:	0.83	0.17	1.00	0.06	0.94	0.00	0.01	0.91	0.08	0.03	0.96	0.01
Final Sat.:	1395	279	1599	113	1676	0	15	1471	129	56	1394	3
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.04	0.04	0.04	0.00	0.48	0.48	0.48	0.34	0.34	0.34
Crit Moves:		****						****				
Green/Cycle:	0.12	0.12	0.12	0.12	0.12	0.00	0.74	0.74	0.74	0.74	0.74	0.74
Volume/Cap:	0.65	0.65	0.38	0.38	0.38	0.00	0.65	0.65	0.65	0.46	0.46	0.46
Level Of Service Module:												
Delay/Veh:	22.8	22.8	17.8	17.7	17.7	0.0	3.6	3.6	3.6	2.4	2.4	2.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.8	22.8	17.8	17.7	17.7	0.0	3.6	3.6	3.6	2.4	2.4	2.4
AustraQueue:	2	1	1	0	1	0	0	6	1	0	3	0

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #8 Maple St/Pacific Av

Cycle (sec):	60	Critical Vol./Cap. (X):	0.725
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	8.0
Optimal Cycle:	54	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	0 1	0	0 0	0 0	0	0 1	1 0	1	0 2	0 0
Volume Module:												
Base Vol:	133	0	119	0	0	0	0	1176	128	174	1205	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	133	0	119	0	0	0	0	1176	128	174	1205	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	140	0	126	0	0	0	0	1241	135	184	1271	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	140	0	126	0	0	0	0	1241	135	184	1271	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.05	1.00
Final Vol.:	140	0	126	0	0	0	0	1303	142	184	1335	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.94	1.00	0.84	1.00	1.00	1.00	1.00	0.95	0.95	0.94	0.98	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.80	0.20	1.00	2.00	0.00
Final Sat.:	1787	0	1599	0	0	0	0	3266	356	1787	3732	0
Capacity Analysis Module:												
Vol/Sat:	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.40	0.40	0.10	0.36	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.55	0.55	0.14	0.69	0.00
Volume/Cap:	0.73	0.00	0.73	0.00	0.00	0.00	0.00	0.73	0.73	0.73	0.52	0.00
Level Of Service Module:												
Delay/Veh:	25.2	0.0	26.4	0.0	0.0	0.0	0.0	7.5	7.5	22.6	3.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.2	0.0	26.4	0.0	0.0	0.0	0.0	7.5	7.5	22.6	3.0	0.0
AustraQueue:	3	0	3	0	0	0	0	17	2	4	11	0

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #9 Maple St/Hwy 47

Average Delay (sec/veh): 14.0 Worst Case Level Of Service: F

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Stop Sign				Stop Sign				Uncontrolled				Uncontrolled			
Rights:	Include				Include				Include				Include			
Lanes:	0	0	1!	0 0	0	0	1!	0 0	1	0	0	1 0	1	0	0	1 0
Volume Module:																
Base Vol:	68	96	108		47	63	75		49	367	59		118	413	67	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	68	96	108		47	63	75		49	367	59		118	413	67	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	0.88	0.88	0.88		0.88	0.88	0.88		0.88	0.88	0.88		0.88	0.88	0.88	
PHF Volume:	77	109	123		53	72	85		56	417	67		134	469	76	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Final Vol.:	77	109	123		53	72	85		56	417	67		134	469	76	
Adjusted Volume Module:																
Grade:		0%				0%				0%				0%		
% Cycle/Cars:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
% Truck/Comb:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
PCE Adj:	1.10	1.10	1.10		1.10	1.10	1.10		1.10	1.00	1.00		1.10	1.00	1.00	
Cycl/Car PCE:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
Trck/Cmb PCE:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
Adj Vol.:	85	120	135		59	79	94		61	417	67		148	469	76	
Critical Gap Module:																
MoveUp Time:	3.4	3.3	2.6		3.4	3.3	2.6		2.1	xxxx	xxxxx		2.1	xxxx	xxxxx	
Critical Gp:	6.5	6.0	5.5		6.5	6.0	5.5		5.0	xxxx	xxxxx		5.0	xxxx	xxxxx	
Capacity Module:																
Cnflict Vol:	1226	1186	451		1264	1181	507		545	xxxx	xxxxx		484	xxxx	xxxxx	
Potent Cap.:	206	260	819		196	262	766		942	xxxx	xxxxx		1008	xxxx	xxxxx	
Adj Cap:	0.53	0.80	1.00		0.39	0.80	1.00		1.00	xxxx	xxxxx		1.00	xxxx	xxxxx	
Move Cap.:	109	208	819		77	209	766		942	xxxx	xxxxx		1008	xxxx	xxxxx	
Level Of Service Module:																
Stopped Del:	102.6	36.1	5.2		140.0	26.1	5.3		4.1	xxxx	xxxxx		4.1	xxxx	xxxxx	
LOS by Move:	*	*	*		*	*	*		A	*	*		A	*	*	
Movement:	LT -	LTR -	RT		LT -	LTR -	RT		LT -	LTR -	RT		LT -	LTR -	RT	
Shared Cap.:	xxxx	224	xxxxx		xxxx	182	xxxxx		xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx	
Shrd StpDel:	xxxxx	40.4	xxxxx		xxxxx	46.6	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
Shared LOS:	*	E	*		*	F	*		*	*	*		*	*	*	
ApproachDel:		40.4				46.6				0.5				0.9		

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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #10 Hwy 47-Quince/Pacific Ave

Cycle (sec): 120 Critical Vol./Cap. (X): 1.010
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 41.4
Optimal Cycle: 180 Level Of Service: E

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Protected				Protected				Protected				Protected			
Rights:	Ovl				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Lanes:	1	0	1	0 1	1	0	1	0 1	1	0	2	0 1	1	0	1	1 0
Volume Module:																
Base Vol:	39	235	327		347	270	115		43	975	84		356	1199	483	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	39	235	327		347	270	115		43	975	84		356	1199	483	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	0.96	0.96	0.96		0.96	0.96	0.96		0.96	0.96	0.96		0.96	0.96	0.96	
PHF Volume:	40	244	340		360	280	119		45	1012	87		370	1245	502	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	40	244	340		360	280	119		45	1012	87		370	1245	502	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.05	1.00		1.00	1.05	1.05	
Final Vol.:	40	244	340		360	280	119		45	1063	87		370	1307	527	
Saturation Flow Module:																
Sat/Lane:	1900	1900	1900		1900	1900	1900		1900	1900	1900		1900	1900	1900	
Adjustment:	0.90	0.95	0.81		0.91	0.96	0.82		0.93	0.98	0.83		0.94	0.95	0.95	
Lanes:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	2.00	1.00		1.00	1.43	0.57	
Final Sat.:	1719	1810	1538		1736	1827	1553		1770	3725	1583		1787	2574	1038	
Capacity Analysis Module:																
Vol/Sat:	0.02	0.13	0.22		0.21	0.15	0.08		0.03	0.29	0.05		0.21	0.51	0.51	
Crit Moves:		****				****				****				****		
Green/Cycle:	0.04	0.13	0.36		0.21	0.29	0.29		0.03	0.31	0.31		0.22	0.50	0.50	
Volume/Cap:	0.52	1.01	0.62		1.01	0.52	0.26		1.01	0.93	0.18		0.93	1.01	1.01	
Level of Service Module:																
Delay/Veh:	41.0	81.1	22.2		70.2	23.6	21.0		145.9	36.0	19.8		50.4	37.8	37.8	
User DelAdj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
AdjDel/Veh:	41.0	81.1	22.2		70.2	23.6	21.0		145.9	36.0	19.8		50.4	37.8	37.8	
AustraQueue:	1	12	10		17	8	3		3	38	2		15	54	24	

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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #13 Elm St/Pacific Av

Cycle (sec): 55 Critical Vol./Cap. (X): 0.647
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 3.6
Optimal Cycle: 38 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1! 0	0	0	0 1	0	0	0 1	0	0	1! 0
Volume Module:												
Base Vol:	26	28	4	0	15	1	0	437	1	34	669	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	26	28	4	0	15	1	0	437	1	34	669	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	28	31	4	0	16	1	0	478	1	37	731	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	28	31	4	0	16	1	0	478	1	37	731	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	28	31	4	0	16	1	0	478	1	37	731	3
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.84	0.84	0.84	1.00	0.86	0.86	1.00	0.90	0.90	0.79	0.79	0.79
Lanes:	0.44	0.50	0.06	0.00	0.94	0.06	0.00	0.99	0.01	0.04	0.95	0.01
Final Sat.:	707	783	101	0	1545	97	0	1706	4	72	1425	6
Capacity Analysis Module:												
Vol/Sat:	0.04	0.04	0.04	0.00	0.01	0.01	0.00	0.28	0.28	0.51	0.51	0.51
Crit Moves:		****									****	
Green/Cycle:	0.06	0.06	0.06	0.00	0.06	0.06	0.00	0.79	0.79	0.79	0.79	0.79
Volume/Cap:	0.65	0.65	0.65	0.00	0.17	0.17	0.00	0.35	0.35	0.65	0.65	0.65
Level Of Service Module:												
Delay/Veh:	28.4	28.4	28.4	0.0	18.7	18.7	0.0	1.3	1.3	2.7	2.7	2.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.4	28.4	28.4	0.0	18.7	18.7	0.0	1.3	1.3	2.7	2.7	2.7
AustraQueue:	1	1	0	0	0	0	0	2	0	1	5	0

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Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #14 College-Council/Pacific Av

Cycle (sec): 55 Critical Vol./Cap. (X): 0.988
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 26.0
Optimal Cycle: 110 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	0	1! 0	0	1	0 0	0	0	0 1
Volume Module:												
Base Vol:	131	124	2	99	0	51	26	234	0	0	537	51
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	131	124	2	99	0	51	26	234	0	0	537	51
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
PHF Volume:	166	157	3	125	0	64	33	296	0	0	679	64
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	166	157	3	125	0	64	33	296	0	0	679	64
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	166	157	3	125	0	64	33	296	0	0	679	64
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.59	0.78	0.78	0.47	1.00	0.47	0.63	0.63	1.00	1.00	0.62	0.62
Lanes:	1.00	0.98	0.02	0.66	0.00	0.34	0.10	0.90	0.00	0.00	0.91	0.09
Final Sat.:	1130	1459	28	592	0	303	120	1077	0	0	1073	101
Capacity Analysis Module:												
Vol/Sat:	0.15	0.11	0.11	0.21	0.00	0.21	0.27	0.27	0.00	0.00	0.63	0.63
Crit Moves:				****							****	
Green/Cycle:	0.21	0.21	0.21	0.21	0.00	0.21	0.64	0.64	0.00	0.00	0.64	0.64
Volume/Cap:	0.69	0.50	0.50	0.99	0.00	0.99	0.43	0.43	0.00	0.00	0.99	0.99
Level Of Service Module:												
Delay/Veh:	20.5	15.6	15.6	62.8	0.0	62.8	4.0	4.0	0.0	0.0	29.8	29.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.5	15.6	15.6	62.8	0.0	62.8	4.0	4.0	0.0	0.0	29.8	29.8
AustraQueue:	3	2	0	5	0	3	0	2	0	0	16	3

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #15 Main St/Pacific Av

Cycle (sec):	55	Critical Vol./Cap. (X):	1.019
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	38.7
Optimal Cycle:	133	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1! 0	0	0	1! 0	0	0	1! 0	0	0	1! 0
Volume Module:												
Base Vol:	37	30	53	8	108	42	16	199	18	56	517	107
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	37	30	53	8	108	42	16	199	18	56	517	107
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	42	34	60	9	122	47	18	225	20	63	584	121
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	42	34	60	9	122	47	18	225	20	63	584	121
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	42	34	60	9	122	47	18	225	20	63	584	121
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.45	0.45	0.45	0.60	0.60	0.60	0.64	0.64	0.64	0.57	0.57	0.57
Lanes:	0.31	0.25	0.44	0.05	0.69	0.26	0.07	0.85	0.08	0.08	0.76	0.16
Final Sat.:	263	213	376	58	782	301	83	1042	93	89	821	170
Capacity Analysis Module:												
Vol/Sat:	0.16	0.16	0.16	0.16	0.16	0.16	0.22	0.22	0.22	0.71	0.71	0.71
Crit Moves:		****									****	
Green/Cycle:	0.16	0.16	0.16	0.16	0.16	0.16	0.70	0.70	0.70	0.70	0.70	0.70
Volume/Cap:	1.02	1.02	1.02	0.99	0.99	0.99	0.31	0.31	0.31	1.02	1.02	1.02
Level Of Service Module:												
Delay/Veh:	83.9	83.9	83.9	67.8	67.8	67.8	2.5	2.5	2.5	36.4	36.4	36.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	83.9	83.9	83.9	67.8	67.8	67.8	2.5	2.5	2.5	36.4	36.4	36.4
AustraQueue:	2	2	3	1	5	2	0	1	0	3	16	5

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #20 B St/Willamina

Cycle (sec):	1	Critical Vol./Cap. (X):	0.300
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	2.3
Optimal Cycle:	0	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	0	1! 0	0	0	1! 0	0	0	1! 0	0	0	1! 0
Volume Module:												
Base Vol:	6	42	11	64	39	10	7	30	5	9	37	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	42	11	64	39	10	7	30	5	9	37	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	7	47	12	72	44	11	8	34	6	10	41	77
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	7	47	12	72	44	11	8	34	6	10	41	77
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	7	47	12	72	44	11	8	34	6	10	41	77
Saturation Flow Module:												
Sat/Lane:	478	478	478	687	687	687	483	483	483	427	427	427
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.11	0.71	0.18	0.57	0.34	0.09	0.17	0.71	0.12	0.08	0.32	0.60
Final Sat.:	51	340	87	389	238	60	81	342	60	33	137	257
Capacity Analysis Module:												
Vol/Sat:	0.14	0.14	0.14	0.18	0.18	0.18	0.10	0.10	0.10	0.30	0.30	0.30
Crit Moves:			****		****				****			****
ApproachV/S:		0.14			0.18			0.10			0.30	
Level Of Service Module:												
Delay/Veh:	1.7	1.7	1.7	2.0	2.0	2.0	1.5	1.5	1.5	3.1	3.1	3.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.7	1.7	1.7	2.0	2.0	2.0	1.5	1.5	1.5	3.1	3.1	3.1
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:		1.7			2.0			1.5			3.1	
LOS by Appr:		A			A			A			A	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #25 Main St/23rd Av

Average Delay (sec/veh): 1.2 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 1	0	0	0 0	0	1 0	0 0	1! 0	0	0 0	0	0 0
Volume Module:												
Base Vol:	117	144	0	0	103	26	12	0	41	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	117	144	0	0	103	26	12	0	41	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	123	152	0	0	109	27	13	0	43	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	123	152	0	0	109	27	13	0	43	0	0	0
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	136	152	0	0	109	27	14	0	48	0	0	0
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	xxxxx	xxxx	xxxxx
Critical Gp:	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	136	xxxx	xxxxx	xxxx	xxxx	xxxxx	397	xxxx	122	xxxx	xxxx	xxxxx
Potent Cap.:	1477	xxxx	xxxxx	xxxx	xxxx	xxxxx	623	xxxx	1201	xxxx	xxxx	xxxxx
Adj Cap:	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.90	xxxx	1.00	xxxx	xxxx	xxxxx
Move Cap.:	1477	xxxx	xxxxx	xxxx	xxxx	xxxxx	561	xxxx	1201	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	2.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.6	xxxx	3.1	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	954	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	3.9	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:		1.3			0.0			3.9			0.0	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #28 Highway 47/Elm St

Average Delay (sec/veh): 2.3 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	1 0	0	1 0	1 0	0	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	6	47	18	30	18	70	56	264	19	19	500	48
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	47	18	30	18	70	56	264	19	19	500	48
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	7	52	20	33	20	77	62	291	21	21	552	53
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	7	52	20	33	20	77	62	291	21	21	552	53
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.00	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	7	57	22	36	22	85	68	291	21	23	552	53
Critical Gap Module:												
MoveUp Time:	3.4	3.3	2.6	3.4	3.3	2.6	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx
Critical Gp:	6.5	6.0	5.5	6.5	6.0	5.5	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1012	990	302	999	974	578	605	xxxx	xxxxx	312	xxxx	xxxxx
Potent Cap.:	275	330	974	280	336	705	883	xxxx	xxxxx	1217	xxxx	xxxxx
Adj Cap:	0.77	0.91	1.00	0.78	0.91	1.00	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx
Move Cap.:	212	299	974	217	305	705	883	xxxx	xxxxx	1217	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	17.5	14.6	3.8	19.6	12.6	5.7	4.4	xxxx	xxxxx	3.0	xxxx	xxxxx
LOS by Move:	C	*	*	C	*	*	A	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	370	xxxx	xxxx	556	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	11.6	xxxxx	xxxx	7.1	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	C	*	*	B	*	*	*	*	*	*
ApproachDel:		12.1			10.3			0.8			0.1	

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #29 Gales Crk Rd/Willamina

Average Delay (sec/veh): 0.4 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0	1 0		1 0	1 0	0	0 0	0 0	0	0 0	1! 0	0
Volume Module:												
Base Vol:	0	259	40	31	114	0	0	0	0	3	0	9
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	259	40	31	114	0	0	0	0	3	0	9
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	280	43	34	123	0	0	0	0	3	0	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	280	43	34	123	0	0	0	0	3	0	10
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	0	280	43	37	123	0	0	0	0	4	0	11
Critical Gap Module:												
MoveUp Time:	xxxxx	xxxx	xxxxx	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6
Critical Gp:	xxxxx	xxxx	xxxxx	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	323	xxxx	xxxxx	xxxx	xxxx	xxxxx	458	xxxx	302
Potent Cap.:	xxxx	xxxx	xxxxx	1202	xxxx	xxxxx	xxxx	xxxx	xxxxx	575	xxxx	974
Adj Cap:	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.97	xxxx	1.00
Move Cap.:	xxxx	xxxx	xxxxx	1202	xxxx	xxxxx	xxxx	xxxx	xxxxx	557	xxxx	974
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	3.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	3.7
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	820	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.4	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	A	*
ApproachDel:	0.0			0.7			0.0			4.4		

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #31 Thatcher Rd/Gales Crk Rd

Average Delay (sec/veh): 2.5 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0	0		0 0	1! 0	0	1 0	1 0	0	0 0	0 1	0
Volume Module:												
Base Vol:	0	0	0	120	0	52	25	165	0	0	339	102
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	120	0	52	25	165	0	0	339	102
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
PHF Volume:	0	0	0	140	0	60	29	192	0	0	394	119
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	140	0	60	29	192	0	0	394	119
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	0	0	0	153	0	67	32	192	0	0	394	119
Critical Gap Module:												
MoveUp Time:	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Critical Gp:	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	674	xxxx	453	513	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	431	xxxx	816	977	xxxx	xxxxx	xxxx	xxxx	xxxxx
Adj Cap:	xxxx	xxxx	xxxxx	0.97	xxxx	1.00	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	417	xxxx	816	977	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	13.0	xxxx	4.8	3.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	489	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	10.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	C	*	*	*	*	*	*	*
ApproachDel:	0.0			10.5			0.5			0.0		

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #32 Gales Creek Rd/Forest Gale Dr

Average Delay (sec/veh): 1.3 Worst Case Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	1 0	0	1 0	1 0	0	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	4	0	13	60	3	1	1	70	2	27	116	128
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	0	13	60	3	1	1	70	2	27	116	128
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	4	0	14	66	3	1	1	77	2	30	128	141
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	4	0	14	66	3	1	1	77	2	30	128	141
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		0.00	0.86		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		0.12	0.02		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	xxxx	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		0.50	1.00		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		1.50	2.00		xxxx	xxxx	
Adj Vol.:	5	0	16	73	4	1	1	77	2	33	128	141
Critical Gap Module:												
MoveUp Time:	3.4	xxxx	2.6	3.4	3.3	2.6	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx
Critical Gp:	6.5	xxxx	5.5	6.5	6.0	5.5	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	309	xxxx	78	314	308	198	269	xxxx	xxxxx	79	xxxx	xxxxx
Potent Cap.:	701	xxxx	1264	696	752	1099	1277	xxxx	xxxxx	1571	xxxx	xxxxx
Adj Cap:	0.98	xxxx	1.00	0.97	0.98	1.00	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx
Move Cap.:	686	xxxx	1264	676	735	1099	1277	xxxx	xxxxx	1571	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	5.3	xxxx	2.9	5.9	4.9	3.3	2.8	xxxx	xxxxx	2.3	xxxx	xxxxx
LOS by Move:	B	*	*	B	*	*	A	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	1264	xxxx	xxxx	802	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	2.9	xxxxx	xxxx	4.5	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	A	*	*	A	*	*	*	*	*	*
ApproachDel:		3.4			5.8			0.0			0.3	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #33 Thatcher Rd/Watercrest Rd

Average Delay (sec/veh): 6.4 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 1	0	0 0	0 0	1!	0 0	0 0	1!	0 0	0 0	0	1 0
Volume Module:												
Base Vol:	25	96	0	296	131	67	29	84	24	0	159	311
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	25	96	0	296	131	67	29	84	24	0	159	311
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	27	102	0	316	140	72	31	90	26	0	170	332
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	27	102	0	316	140	72	31	90	26	0	170	332
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	29	102	0	347	140	72	34	99	28	0	187	365
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx	3.4	3.3	2.6	xxxxx	3.3	2.6
Critical Gp:	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx	6.5	6.0	5.5	xxxxx	6.0	5.5
Capacity Module:												
Cnflict Vol:	211	xxxx	xxxxx	102	xxxx	xxxxx	871	621	176	xxxx	656	102
Potent Cap.:	1360	xxxx	xxxxx	1532	xxxx	xxxxx	331	515	1128	xxxx	494	1229
Adj Cap:	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx	0.33	0.72	1.00	xxxx	0.72	1.00
Move Cap.:	1360	xxxx	xxxxx	1532	xxxx	xxxxx	110	373	1128	xxxx	357	1229
Level Of Service Module:												
Stopped Del:	2.7	xxxx	xxxxx	3.0	xxxx	xxxxx	45.2	12.7	3.3	xxxxx	19.1	4.0
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	269	xxxxx	xxxx	xxxx	673
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	17.9	xxxxx	xxxxx	xxxx	9.1
Shared LOS:	*	*	*	*	*	*	*	C	*	*	*	B
ApproachDel:		0.6			1.8			17.9			9.1	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #39 Sunset/Willamina

Average Delay (sec/veh): 2.3 Worst Case Level Of Service: C

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Rights:	Include				Include				Include				Include			
Lanes:	0	0	1!	0 0	0	0	1!	0 0	0	0	1!	0 0	0	0	1!	0 0
Volume Module:																
Base Vol:	67	362	12		28	285	131		69	4	31		17	16	24	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	67	362	12		28	285	131		69	4	31		17	16	24	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	0.95	0.95	0.95		0.95	0.95	0.95		0.95	0.95	0.95		0.95	0.95	0.95	
PHF Volume:	70	380	13		29	299	138		72	4	33		18	17	25	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Final Vol.:	70	380	13		29	299	138		72	4	33		18	17	25	
Adjusted Volume Module:																
Grade:	0%				0%				0%				0%			
% Cycle/Cars:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
% Truck/Comb:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
PCE Adj:	1.10	1.00	1.00		1.10	1.00	1.00		1.10	1.10	1.10		1.10	1.10	1.10	
Cycl/Car PCE:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
Trck/Cmb PCE:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
Adj Vol.:	77	380	13		32	299	138		80	5	36		20	18	28	
Critical Gap Module:																
MoveUp Time:	2.1	xxxx	xxxxx		2.1	xxxx	xxxxx		3.4	3.3	2.6		3.4	3.3	2.6	
Critical Gp:	5.0	xxxx	xxxxx		5.0	xxxx	xxxxx		6.5	6.0	5.5		6.5	6.0	5.5	
Capacity Module:																
Cnflict Vol:	437	xxxx	xxxxx		393	xxxx	xxxxx		876	861	368		873	923	387	
Potent Cap.:	1061	xxxx	xxxxx		1114	xxxx	xxxxx		329	386	901		331	357	882	
Adj Cap:	1.00	xxxx	xxxxx		1.00	xxxx	xxxxx		0.83	0.87	1.00		0.86	0.87	1.00	
Move Cap.:	1061	xxxx	xxxxx		1114	xxxx	xxxxx		274	335	901		283	311	882	
Level Of Service Module:																
Stopped Del:	3.6	xxxx	xxxxx		3.3	xxxx	xxxxx		17.8	10.9	4.1		13.6	12.2	4.2	
LOS by Move:	A	*	*		A	*	*		*	*	*		*	*	*	
Movement:	LT -	LTR -	RT		LT -	LTR -	RT		LT -	LTR -	RT		LT -	LTR -	RT	
Shared Cap.:	xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx	349	xxxxx		xxxx	411	xxxxx	
Shrd StpDel:	xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	13.5	xxxxx		xxxxx	9.3	xxxxx	
Shared LOS:	*	*	*		*	*	*		*	C	*		*	B	*	
ApproachDel:	0.6				0.2				13.5				9.3			

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Lane Geometry Report

Number of approach lanes: (L) (LT) (T) (RT) (R) (LTR)

Node	Intersection	NB	SB	EB	WB
1	E St/Pacific Ave	101000	000100	100010	000000
2	B St/Pacific Av	000001	000100	100100	100100
3	B Ave/19th Street	010010	100100	000001	000001
5	Council St/19th Ave	000000	000000	010000	000100
6	Elm St/19th Ave	010010	010000	000001	000001
8	Maple St/Pacific Av	100010	000000	001100	102000
9	Maple St/Hwy 47	000001	000001	100100	100100
10	Hwy 47-Quince/Pacific Ave	101010	101010	102010	101100
13	Elm St/Pacific Av	000001	000100	000100	000001
14	College-Council/Pacific Av	100100	000001	010000	000100
15	Main St/Pacific Av	000001	000001	000001	000001
20	B St/Willamina	000001	000001	000001	000001
25	Main St/23rd Av	010000	000100	000001	000000
28	Highway 47/Elm St	100100	100100	100100	100100
29	Gales Crk Rd/Willamina	000100	101000	000000	000001
31	Thatcher Rd/Gales Crk Rd	000000	000001	101000	000100
32	Gales Creek Rd/Forest Gale Dr	100100	100100	100100	100100
33	Thatcher Rd/Watercrest Rd	010000	000001	000001	000100
39	Sunset/Willamina	000001	000001	000001	000001

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Intersection Volume Report
Base Volume Alternative

Node	Intersection	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R
1	E St/Pacific	64	385	0	0	298	2	10	0	150	0	0	0
2	B St/Pacific	171	34	11	0	80	7	11	223	162	98	452	30
3	B Ave/19th St	6	110	0	220	179	3	1	14	7	122	0	82
5	Council St/19	0	0	0	0	0	0	85	488	0	0	210	162
6	Elm St/19th A	93	19	63	4	66	0	6	627	55	17	419	1
8	Maple St/Paci	133	0	119	0	0	0	0	1176	128	174	1205	0
9	Maple St/Hwy	68	96	108	47	63	75	49	367	59	118	413	67
10	Hwy 47-Quince	39	235	327	347	270	115	43	975	84	356	1199	483
13	Elm St/Pacifi	26	28	4	0	15	1	0	437	1	34	669	3
14	College-Counc	131	124	2	99	0	51	26	234	0	0	537	51
15	Main St/Pacif	37	30	53	8	108	42	16	199	18	56	517	107
20	B St/Willamin	6	42	11	64	39	10	7	30	5	9	37	69
25	Main St/23rd	117	144	0	0	103	26	12	0	41	0	0	0
28	Highway 47/El	6	47	18	30	18	70	56	264	19	19	500	48
29	Gales Crk Rd/	0	259	40	31	114	0	0	0	0	3	0	9
31	Thatcher Rd/G	0	0	0	120	0	52	25	165	0	0	339	102
32	Gales Creek R	4	0	13	60	3	1	1	70	2	27	116	128
33	Thatcher Rd/W	25	96	0	296	131	67	29	84	24	0	159	311
39	Sunset/Willam	67	362	12	28	285	131	69	4	31	17	16	24

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 E St/Pacific Ave	C	1.2	0.000	C	1.2	0.000	+ 0.000 V/C
# 2 B St/Pacific Av	C	15.6	0.687	C	15.6	0.687	+ 0.000 D/V
# 3 B Ave/19th Street	B	5.9	0.729	B	5.9	0.729	+ 0.000 V/C
# 5 Council St/19th Ave	A	0.3	0.000	A	0.3	0.000	+ 0.000 V/C
# 6 Elm St/19th Ave	B	6.2	0.650	B	6.2	0.650	+ 0.000 D/V
# 8 Maple St/Pacific Av	B	8.0	0.725	B	8.0	0.725	+ 0.000 D/V
# 9 Maple St/Hwy 47	F	14.0	0.000	F	14.0	0.000	+ 0.000 V/C
# 10 Hwy 47-Quince/Pacific Ave	E	41.4	1.010	E	41.4	1.010	+ 0.000 D/V
# 13 Elm St/Pacific Av	A	3.6	0.647	A	3.6	0.647	+ 0.000 D/V
# 14 College-Council/Pacific Av	D	26.0	0.988	D	26.0	0.988	+ 0.000 D/V
# 15 Main St/Pacific Av	D	38.7	1.019	D	38.7	1.019	+ 0.000 D/V
# 20 B St/Willamina	A	2.3	0.300	A	2.3	0.300	+ 0.000 V/C
# 25 Main St/23rd Av	A	1.2	0.000	A	1.2	0.000	+ 0.000 V/C
# 28 Highway 47/Elm St	C	2.3	0.000	C	2.3	0.000	+ 0.000 V/C
# 29 Gales Crk Rd/Willamina	A	0.4	0.000	A	0.4	0.000	+ 0.000 V/C
# 31 Thatcher Rd/Gales Crk Rd	C	2.5	0.000	C	2.5	0.000	+ 0.000 V/C
# 32 Gales Creek Rd/Forest Gale Dr	B	1.3	0.000	B	1.3	0.000	+ 0.000 V/C
# 33 Thatcher Rd/Watercrest Rd	C	6.4	0.000	C	6.4	0.000	+ 0.000 V/C
# 39 Sunset/Willamina	C	2.3	0.000	C	2.3	0.000	+ 0.000 V/C

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #1 E St/Pacific Ave

Average Delay (sec/veh): 1.2 Worst Case Level Of Service: C

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Uncontrolled				Uncontrolled				Stop Sign				Stop Sign			
Rights:	Include				Include				Include				Include			
Lanes:	1	0	1	0 0	0	0	0	1 0	1	0	0	0 1	0	0	0	0 0
Volume Module:																
Base Vol:	64	385		0	0	298		2	10		0	150	0		0	0
Growth Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Initial Bse:	64	385		0	0	298		2	10		0	150	0		0	0
User Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
PHF Adj:	0.93	0.93		0.93	0.93	0.93		0.93	0.93		0.93	0.93	0.93		0.93	0.93
PHF Volume:	69	416		0	0	322		2	11		0	162	0		0	0
Reduct Vol:	0	0		0	0	0		0	0		0	0	0		0	0
Final Vol.:	69	416		0	0	322		2	11		0	162	0		0	0
Adjusted Volume Module:																
Grade:	0%				0%				0%				0%			
% Cycle/Cars:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
% Truck/Comb:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
PCE Adj:	1.10	1.00		1.00	1.10	1.00		1.00	1.10	1.10		1.10	1.10	1.10		1.10
Cycl/Car PCE:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
Trck/Cmb PCE:	xxxx	xxxx			xxxx	xxxx			xxxx	xxxx			xxxx	xxxx		
Adj Vol.:	76	416		0	0	322		2	12		0	178	0		0	0
Critical Gap Module:																
MoveUp Time:	2.1	xxxx	xxxxx	xxxxx xxxx xxxxx					3.4	xxxx		2.6	xxxxx	xxxx	xxxxx	
Critical Gp:	5.0	xxxx	xxxxx	xxxxx xxxx xxxxx					6.5	xxxx		5.5	xxxxx	xxxx	xxxxx	
Capacity Module:																
Cnflict Vol:	324	xxxx	xxxxx	xxxx xxxx xxxxx					808	xxxx		323	xxxx	xxxx	xxxxx	
Potent Cap.:	1201	xxxx	xxxxx	xxxx xxxx xxxxx					361	xxxx		950	xxxx	xxxx	xxxxx	
Adj Cap:	1.00	xxxx	xxxxx	xxxx xxxx xxxxx					0.94	xxxx		1.00	xxxx	xxxx	xxxxx	
Move Cap.:	1201	xxxx	xxxxx	xxxx xxxx xxxxx					338	xxxx		950	xxxx	xxxx	xxxxx	
Level Of Service Module:																
Stopped Del:	3.2	xxxx	xxxxx	xxxxx xxxx xxxxx					11.0	xxxx		4.6	xxxxx	xxxx	xxxxx	
LOS by Move:	A	*		*	*	*		*	C	*		A	*	*		*
Movement:	LT - LTR - RT				LT - LTR - RT				LT - LTR - RT				LT - LTR - RT			
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx xxxx xxxxx					xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx	
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx xxxx xxxxx					xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx	
Shared LOS:	*	*		*	*	*		*	*	*		*	*	*		*
ApproachDel:	0.5				0.0				5.0				0.0			

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #2 B St/Pacific Av

Cycle (sec): 80 Critical Vol./Cap. (X): 0.687
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 15.6
Optimal Cycle: 55 Level Of Service: C

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Permitted				Permitted				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0		0	0	0		0	0	0		0	0	0		0
Lanes:	0	0	1!	0 0	0	0	0	1 0	1	0	0	1 0	1	0	0	1 0
Volume Module:																
Base Vol:	171	34		11	0	80		7	11	223		162	98	452		30
Growth Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Initial Bse:	171	34		11	0	80		7	11	223		162	98	452		30
User Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Adj:	0.90	0.90		0.90	0.90	0.90		0.90	0.90	0.90		0.90	0.90	0.90		0.90
PHF Volume:	190	38		12	0	89		8	12	248		180	109	503		33
Reduct Vol:	0	0		0	0	0		0	0	0		0	0	0		0
Reduced Vol:	190	38		12	0	89		8	12	248		180	109	503		33
PCE Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
MLF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Final Vol.:	190	38		12	0	89		8	12	248		180	109	503		33
Saturation Flow Module:																
Sat/Lane:	1900	1900		1900	1900	1900		1900	1900	1900		1900	1900	1900		1900
Adjustment:	0.53	0.53		0.53	1.00	0.78		0.78	0.83	0.81		0.81	0.83	0.85		0.85
Lanes:	0.79	0.16		0.05	0.00	0.92		0.08	1.00	0.58		0.42	1.00	0.94		0.06
Final Sat.:	803	161		51	0	1356		122	1577	890		646	1577	1518		100
Capacity Analysis Module:																
Vol/Sat:	0.24	0.24		0.24	0.00	0.07		0.07	0.01	0.28		0.28	0.07	0.33		0.33
Crit Moves:		****								****			****			
Green/Cycle:	0.34	0.34		0.34	0.00	0.34		0.34	0.01	0.41		0.41	0.10	0.49		0.49
Volume/Cap:	0.69	0.69		0.69	0.00	0.19		0.19	0.67	0.69		0.69	0.69	0.67		0.67
Level Of Service Module:																
Delay/Veh:	18.4	18.4		18.4	0.0	11.9		11.9	65.2	14.9		14.9	30.3	11.4		11.4
User DelAdj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
AdjDel/Veh:	18.4	18.4		18.4	0.0	11.9		11.9	65.2	14.9		14.9	30.3	11.4		11.4
AustraQueue:	4	1		1	0	1		0	1	5		4	3	9		1

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #3 B Ave/19th Street

Cycle (sec): 1 Critical Vol./Cap. (X): 0.729
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 5.9
Optimal Cycle: 0 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Ignore			Include			Include			Include		
Lanes:	0 1	0	0 1	1	0	0 1	0	0	0 1! 0	0	0	0 1! 0 0
Volume Module:												
Base Vol:	6	110	163	220	179	3	1	14	7	122	0	82
Growth Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	110	0	220	179	3	1	14	7	122	0	82
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.77	0.77	0.00	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
PHF Volume:	8	144	0	287	234	4	1	18	9	159	0	107
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	144	0	287	234	4	1	18	9	159	0	107
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	8	144	0	287	234	4	1	18	9	159	0	107
Saturation Flow Module:												
Sat/Lane:	305	305	305	462	462	462	156	156	156	365	365	365
Adjustment:	1.00	1.00	1.00	3.00	3.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.05	0.95	1.00	1.00	0.98	0.02	0.04	0.64	0.32	0.60	0.00	0.40
Final Sat.:	16	289	305	1386	1363	23	6	100	50	218	0	147
Capacity Analysis Module:												
Vol/Sat:	0.50	0.50	0.00	0.21	0.17	0.17	0.18	0.18	0.18	0.73	0.00	0.73
Crit Moves:		****		****					****			****
ApproachV/S:		0.25			0.19			0.18			0.73	
Level Of Service Module:												
Delay/Veh:	6.6	6.6	0.0	2.2	1.9	1.9	2.0	2.0	2.0	15.9	0.0	15.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.6	6.6	0.0	2.2	1.9	1.9	2.0	2.0	2.0	15.9	0.0	15.9
LOS by Move:	B	B	*	A	A	A	A	A	A	C	*	C
ApproachDel:		2.6			2.1			2.0			15.9	
LOS by Appr:		A			A			A			C	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #5 Council St/19th Ave

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	0	0 0	0	0	0 0	0	1	0 0	0	0	0 1 0
Volume Module:												
Base Vol:	0	0	0	0	0	0	85	488	0	0	210	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	85	488	0	0	210	162
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	0	0	0	0	0	91	523	0	0	225	174
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	0	0	0	91	523	0	0	225	174
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	0	0	0	0	0	0	100	523	0	0	225	174
Critical Gap Module:												
MoveUp Time:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	399	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1107	xxxx	xxxxx	xxxx	xxxx	xxxxx
Adj Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1107	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		0.0			0.0			0.6			0.0	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Intersection Volume Report
Base Volume Alternative

Node	Intersection	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R
1	E St/Pacific	64	385	0	0	298	2	10	0	150	0	0	0
2	B St/Pacific	171	34	11	0	80	7	11	223	162	98	452	30
3	B Ave/19th St	6	110	0	220	179	3	1	14	7	122	0	82
5	Council St/19	0	0	0	0	0	0	85	488	0	0	210	162
6	Elm St/19th A	93	19	63	4	66	0	6	627	55	17	419	1
8	Maple St/Paci	133	0	119	0	0	0	0	1176	128	174	1205	0
9	Maple St/Hwy	68	96	108	47	63	75	49	367	59	118	413	67
10	Hwy 47-Quince	39	235	327	347	270	115	43	975	84	356	1199	483
13	Elm St/Pacifi	26	28	4	0	15	1	0	437	1	34	669	3
14	College-Counc	131	124	2	99	0	51	26	234	0	0	537	51
15	Main St/Pacif	37	30	53	8	108	42	16	199	18	56	517	107
20	B St/Willamin	6	42	11	64	39	10	7	30	5	9	37	69
25	Main St/23rd	117	144	0	0	103	26	12	0	41	0	0	0
28	Highway 47/El	6	47	18	30	18	70	56	264	19	19	500	48
29	Gales Crk Rd/	0	259	40	31	114	0	0	0	0	3	0	9
31	Thatcher Rd/G	0	0	0	120	0	52	25	165	0	0	339	102
32	Gales Creek R	4	0	13	60	3	1	1	70	2	27	116	128
33	Thatcher Rd/W	25	96	0	296	131	67	29	84	24	0	159	311
39	Sunset/Willam	67	362	12	28	285	131	69	4	31	17	16	24

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 E St/Pacific Ave	C	1.2	0.000	C	1.2	0.000	+ 0.000 V/C
# 2 B St/Pacific Av	C	15.6	0.687	C	15.6	0.687	+ 0.000 D/V
# 3 B Ave/19th Street	B	5.9	0.729	B	5.9	0.729	+ 0.000 V/C
# 5 Council St/19th Ave	A	0.3	0.000	A	0.3	0.000	+ 0.000 V/C
# 6 Elm St/19th Ave	B	6.2	0.650	B	6.2	0.650	+ 0.000 D/V
# 8 Maple St/Pacific Av	B	8.0	0.725	B	8.0	0.725	+ 0.000 D/V
# 9 Maple St/Hwy 47	F	14.0	0.000	F	14.0	0.000	+ 0.000 V/C
# 10 Hwy 47-Quince/Pacific Ave	E	41.4	1.010	E	41.4	1.010	+ 0.000 D/V
# 13 Elm St/Pacific Av	A	3.6	0.647	A	3.6	0.647	+ 0.000 D/V
# 14 College-Council/Pacific Av	D	26.0	0.988	D	26.0	0.988	+ 0.000 D/V
# 15 Main St/Pacific Av	D	38.7	1.019	D	38.7	1.019	+ 0.000 D/V
# 20 B St/Willamina	A	2.3	0.300	A	2.3	0.300	+ 0.000 V/C
# 25 Main St/23rd Av	A	1.2	0.000	A	1.2	0.000	+ 0.000 V/C
# 28 Highway 47/Elm St	C	2.3	0.000	C	2.3	0.000	+ 0.000 V/C
# 29 Gales Crk Rd/Willamina	A	0.4	0.000	A	0.4	0.000	+ 0.000 V/C
# 31 Thatcher Rd/Gales Crk Rd	C	2.5	0.000	C	2.5	0.000	+ 0.000 V/C
# 32 Gales Creek Rd/Forest Gale Dr	B	1.3	0.000	B	1.3	0.000	+ 0.000 V/C
# 33 Thatcher Rd/Watercrest Rd	C	6.4	0.000	C	6.4	0.000	+ 0.000 V/C
# 39 Sunset/Willamina	C	2.3	0.000	C	2.3	0.000	+ 0.000 V/C

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #1 E St/Pacific Ave

Average Delay (sec/veh): 1.2 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	1 0	1	0 0	0	0 0	1 0	1	0 0	0 1	0	0 0	0 0
Volume Module:												
Base Vol:	64	385	0	0	298	2	10	0	150	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	64	385	0	0	298	2	10	0	150	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	69	416	0	0	322	2	11	0	162	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	69	416	0	0	322	2	11	0	162	0	0	0
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	76	416	0	0	322	2	12	0	178	0	0	0
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	xxxxx	xxxx	xxxxx
Critical Gp:	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	324	xxxx	xxxxx	xxxx	xxxx	xxxxx	808	xxxx	323	xxxx	xxxx	xxxxx
Potent Cap.:	1201	xxxx	xxxxx	xxxx	xxxx	xxxxx	361	xxxx	950	xxxx	xxxx	xxxxx
Adj Cap:	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.94	xxxx	1.00	xxxx	xxxx	xxxxx
Move Cap.:	1201	xxxx	xxxxx	xxxx	xxxx	xxxxx	338	xxxx	950	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	3.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	11.0	xxxx	4.6	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	C	*	A	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		0.5			0.0			5.0			0.0	

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Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #2 B St/Pacific Av

Cycle (sec): 80 Critical Vol./Cap. (X): 0.687
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 15.6
Optimal Cycle: 55 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	1!	0 0	0	0 0	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	171	34	11	0	80	7	11	223	162	98	452	30
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	171	34	11	0	80	7	11	223	162	98	452	30
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	190	38	12	0	89	8	12	248	180	109	503	33
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	190	38	12	0	89	8	12	248	180	109	503	33
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	190	38	12	0	89	8	12	248	180	109	503	33
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.53	0.53	0.53	1.00	0.78	0.78	0.83	0.81	0.81	0.83	0.85	0.85
Lanes:	0.79	0.16	0.05	0.00	0.92	0.08	1.00	0.58	0.42	1.00	0.94	0.06
Final Sat.:	803	161	51	0	1356	122	1577	890	646	1577	1518	100
Capacity Analysis Module:												
Vol/Sat:	0.24	0.24	0.24	0.00	0.07	0.07	0.01	0.28	0.28	0.07	0.33	0.33
Crit Moves:		****						****			****	
Green/Cycle:	0.34	0.34	0.34	0.00	0.34	0.34	0.01	0.41	0.41	0.10	0.49	0.49
Volume/Cap:	0.69	0.69	0.69	0.00	0.19	0.19	0.67	0.69	0.69	0.69	0.67	0.67
Level Of Service Module:												
Delay/Veh:	18.4	18.4	18.4	0.0	11.9	11.9	65.2	14.9	14.9	30.3	11.4	11.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	18.4	18.4	18.4	0.0	11.9	11.9	65.2	14.9	14.9	30.3	11.4	11.4
AustraQueue:	4	1	1	0	1	0	1	5	4	3	9	1

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #3 B Ave/19th Street

Cycle (sec): 1 Critical Vol./Cap. (X): 0.729
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 5.9
Optimal Cycle: 0 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Ignore			Include			Include			Include		
Lanes:	0 1	0	0 1	1	0	0 1	0	0	1! 0	0	0	1! 0
Volume Module:												
Base Vol:	6	110	163	220	179	3	1	14	7	122	0	82
Growth Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	110	0	220	179	3	1	14	7	122	0	82
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.77	0.77	0.00	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
PHF Volume:	8	144	0	287	234	4	1	18	9	159	0	107
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	144	0	287	234	4	1	18	9	159	0	107
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	8	144	0	287	234	4	1	18	9	159	0	107
Saturation Flow Module:												
Sat/Lane:	305	305	305	462	462	462	156	156	156	365	365	365
Adjustment:	1.00	1.00	1.00	3.00	3.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.05	0.95	1.00	1.00	0.98	0.02	0.04	0.64	0.32	0.60	0.00	0.40
Final Sat.:	16	289	305	1386	1363	23	6	100	50	218	0	147
Capacity Analysis Module:												
Vol/Sat:	0.50	0.50	0.00	0.21	0.17	0.17	0.18	0.18	0.18	0.73	0.00	0.73
Crit Moves:		****		****					****			****
ApproachV/S:		0.25			0.19			0.18			0.73	
Level Of Service Module:												
Delay/Veh:	6.6	6.6	0.0	2.2	1.9	1.9	2.0	2.0	2.0	15.9	0.0	15.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.6	6.6	0.0	2.2	1.9	1.9	2.0	2.0	2.0	15.9	0.0	15.9
LOS by Move:	B	B	*	A	A	A	A	A	A	C	*	C
ApproachDel:		2.6			2.1			2.0			15.9	
LOS by Appr:		A			A			A			C	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #5 Council St/19th Ave

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	0	0 0	0	0	0 0	0	1	0 0	0	0	0 1
Volume Module:												
Base Vol:	0	0	0	0	0	0	85	488	0	0	210	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	85	488	0	0	210	162
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	0	0	0	0	0	91	523	0	0	225	174
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	0	0	0	91	523	0	0	225	174
Adjusted Volume Module:												
Grade:		0%			0%			0%			0%	
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	0	0	0	0	0	0	100	523	0	0	225	174
Critical Gap Module:												
MoveUp Time:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	399	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1107	xxxx	xxxxx	xxxx	xxxx	xxxxx
Adj Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1107	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	●	*	*	*	*
ApproachDel:		0.0			0.0			0.6			0.0	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #6 Elm St/19th Ave

Cycle (sec): 55 Critical Vol./Cap. (X): 0.650
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 6.2
Optimal Cycle: 39 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1	0	0 1	0 1	0	0 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	93	19	63	4	66	0	6	627	55	17	419	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	93	19	63	4	66	0	6	627	55	17	419	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	105	21	71	5	74	0	7	707	62	19	472	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	105	21	71	5	74	0	7	707	62	19	472	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	105	21	71	5	74	0	7	707	62	19	472	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.88	0.88	0.84	0.94	0.94	1.00	0.85	0.85	0.85	0.77	0.77	0.77
Lanes:	0.83	0.17	1.00	0.06	0.94	0.00	0.01	0.91	0.08	0.03	0.96	0.01
Final Sat.:	1395	279	1599	113	1676	0	15	1471	129	56	1394	3
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.04	0.04	0.04	0.00	0.48	0.48	0.48	0.34	0.34	0.34
Crit Moves:		****						****				
Green/Cycle:	0.12	0.12	0.12	0.12	0.12	0.00	0.74	0.74	0.74	0.74	0.74	0.74
Volume/Cap:	0.65	0.65	0.38	0.38	0.38	0.00	0.65	0.65	0.65	0.46	0.46	0.46
Level Of Service Module:												
Delay/Veh:	22.8	22.8	17.8	17.7	17.7	0.0	3.6	3.6	3.6	2.4	2.4	2.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.8	22.8	17.8	17.7	17.7	0.0	3.6	3.6	3.6	2.4	2.4	2.4
AustraQueue:	2	1	1	0	1	0	0	6	1	0	3	0

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #8 Maple St/Pacific Av

Cycle (sec): 60 Critical Vol./Cap. (X): 0.725
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 8.0
Optimal Cycle: 54 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	0 1	0	0 0	0 0	0	0 1	1 0	1	0 2	0 0
Volume Module:												
Base Vol:	133	0	119	0	0	0	0	1176	128	174	1205	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	133	0	119	0	0	0	0	1176	128	174	1205	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	140	0	126	0	0	0	0	1241	135	184	1271	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	140	0	126	0	0	0	0	1241	135	184	1271	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.05	1.00
Final Vol.:	140	0	126	0	0	0	0	1303	142	184	1335	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.94	1.00	0.84	1.00	1.00	1.00	1.00	0.95	0.95	0.94	0.98	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.80	0.20	1.00	2.00	0.00
Final Sat.:	1787	0	1599	0	0	0	0	3266	356	1787	3732	0
Capacity Analysis Module:												
Vol/Sat:	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.40	0.40	0.10	0.36	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.55	0.55	0.14	0.69	0.00
Volume/Cap:	0.73	0.00	0.73	0.00	0.00	0.00	0.00	0.73	0.73	0.73	0.52	0.00
Level Of Service Module:												
Delay/Veh:	25.2	0.0	26.4	0.0	0.0	0.0	0.0	7.5	7.5	22.6	3.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.2	0.0	26.4	0.0	0.0	0.0	0.0	7.5	7.5	22.6	3.0	0.0
AustraQueue:	3	0	3	0	0	0	0	17	2	4	11	0

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #9 Maple St/Hwy 47

Average Delay (sec/veh): 14.0 Worst Case Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 0 1! 0 0			1 0 0 1 0			1 0 0 1 0		
Volume Module:												
Base Vol:	68	96	108	47	63	75	49	367	59	118	413	67
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	68	96	108	47	63	75	49	367	59	118	413	67
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
PHF Volume:	77	109	123	53	72	85	56	417	67	134	469	76
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	77	109	123	53	72	85	56	417	67	134	469	76
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	85	120	135	59	79	94	61	417	67	148	469	76
Critical Gap Module:												
MoveUp Time:	3.4	3.3	2.6	3.4	3.3	2.6	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx
Critical Gp:	6.5	6.0	5.5	6.5	6.0	5.5	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1226	1186	451	1264	1181	507	545	xxxx	xxxxx	484	xxxx	xxxxx
Potent Cap.:	206	260	819	196	262	766	942	xxxx	xxxxx	1008	xxxx	xxxxx
Adj Cap:	0.53	0.80	1.00	0.39	0.80	1.00	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx
Move Cap.:	109	208	819	77	209	766	942	xxxx	xxxxx	1008	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	102.6	36.1	5.2	140.0	26.1	5.3	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	224	xxxxx	xxxx	182	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	40.4	xxxxx	xxxxx	46.6	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	E	*	*	F	*	*	*	*	*	*	*
ApproachDel:		40.4			46.6			0.5			0.9	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #10 Hwy 47-Quince/Pacific Ave

Cycle (sec): 120 Critical Vol./Cap. (X): 1.010
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 41.4
Optimal Cycle: 180 Level Of Service: E

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	1	0 1	1 0	1	0 1	1 0	2	0 1	1 0	1	1 0
Volume Module:												
Base Vol:	39	235	327	347	270	115	43	975	84	356	1199	483
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	39	235	327	347	270	115	43	975	84	356	1199	483
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	40	244	340	360	280	119	45	1012	87	370	1245	502
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	40	244	340	360	280	119	45	1012	87	370	1245	502
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.00	1.05	1.05
Final Vol.:	40	244	340	360	280	119	45	1063	87	370	1307	527
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.95	0.81	0.91	0.96	0.82	0.93	0.98	0.83	0.94	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.43	0.57
Final Sat.:	1719	1810	1538	1736	1827	1553	1770	3725	1583	1787	2574	1038
Capacity Analysis Module:												
Vol/Sat:	0.02	0.13	0.22	0.21	0.15	0.08	0.03	0.29	0.05	0.21	0.51	0.51
Crit Moves:		****		****			****				****	
Green/Cycle:	0.04	0.13	0.36	0.21	0.29	0.29	0.03	0.31	0.31	0.22	0.50	0.50
Volume/Cap:	0.52	1.01	0.62	1.01	0.52	0.26	1.01	0.93	0.18	0.93	1.01	1.01
Level Of Service Module:												
Delay/Veh:	41.0	81.1	22.2	70.2	23.6	21.0	145.9	36.0	19.8	50.4	37.8	37.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.0	81.1	22.2	70.2	23.6	21.0	145.9	36.0	19.8	50.4	37.8	37.8
AustraQueue:	1	12	10	17	8	3	3	38	2	15	54	24

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Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #13 Elm St/Pacific Av

Cycle (sec): 55 Critical Vol./Cap. (X): 0.647
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 3.6
Optimal Cycle: 38 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1! 0	0	0	0 1	0	0	0 1	0	0	1! 0
Volume Module:												
Base Vol:	26	28	4	0	15	1	0	437	1	34	669	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	26	28	4	0	15	1	0	437	1	34	669	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	28	31	4	0	16	1	0	478	1	37	731	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	28	31	4	0	16	1	0	478	1	37	731	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	28	31	4	0	16	1	0	478	1	37	731	3
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.84	0.84	0.84	1.00	0.86	0.86	1.00	0.90	0.90	0.79	0.79	0.79
Lanes:	0.44	0.50	0.06	0.00	0.94	0.06	0.00	0.99	0.01	0.04	0.95	0.01
Final Sat.:	707	783	101	0	1545	97	0	1706	4	72	1425	6
Capacity Analysis Module:												
Vol/Sat:	0.04	0.04	0.04	0.00	0.01	0.01	0.00	0.28	0.28	0.51	0.51	0.51
Crit Moves:		****									****	
Green/Cycle:	0.06	0.06	0.06	0.00	0.06	0.06	0.00	0.79	0.79	0.79	0.79	0.79
Volume/Cap:	0.65	0.65	0.65	0.00	0.17	0.17	0.00	0.35	0.35	0.65	0.65	0.65
Level Of Service Module:												
Delay/Veh:	28.4	28.4	28.4	0.0	18.7	18.7	0.0	1.3	1.3	2.7	2.7	2.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.4	28.4	28.4	0.0	18.7	18.7	0.0	1.3	1.3	2.7	2.7	2.7
AustraQueue:	1	1	0	0	0	0	0	2	0	1	5	0

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #14 College-Council/Pacific Av

Cycle (sec): 55 Critical Vol./Cap. (X): 0.988
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 26.0
Optimal Cycle: 110 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	0	1! 0	0	1	0 0	0	0	0 1
Volume Module:												
Base Vol:	131	124	2	99	0	51	26	234	0	0	537	51
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	131	124	2	99	0	51	26	234	0	0	537	51
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
PHF Volume:	166	157	3	125	0	64	33	296	0	0	679	64
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	166	157	3	125	0	64	33	296	0	0	679	64
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	166	157	3	125	0	64	33	296	0	0	679	64
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.59	0.78	0.78	0.47	1.00	0.47	0.63	0.63	1.00	1.00	0.62	0.62
Lanes:	1.00	0.98	0.02	0.66	0.00	0.34	0.10	0.90	0.00	0.00	0.91	0.09
Final Sat.:	1130	1459	28	592	0	303	120	1077	0	0	1073	101
Capacity Analysis Module:												
Vol/Sat:	0.15	0.11	0.11	0.21	0.00	0.21	0.27	0.27	0.00	0.00	0.63	0.63
Crit Moves:				****							****	
Green/Cycle:	0.21	0.21	0.21	0.21	0.00	0.21	0.64	0.64	0.00	0.00	0.64	0.64
Volume/Cap:	0.69	0.50	0.50	0.99	0.00	0.99	0.43	0.43	0.00	0.00	0.99	0.99
Level Of Service Module:												
Delay/Veh:	20.5	15.6	15.6	62.8	0.0	62.8	4.0	4.0	0.0	0.0	29.8	29.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.5	15.6	15.6	62.8	0.0	62.8	4.0	4.0	0.0	0.0	29.8	29.8
AustraQueue:	3	2	0	5	0	3	0	2	0	0	16	3

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #15 Main St/Pacific Av

Cycle (sec): 55 Critical Vol./Cap. (X): 1.019
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 38.7
Optimal Cycle: 133 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1! 0	0	0	1! 0	0	0	1! 0	0	0	1! 0
Volume Module:												
Base Vol:	37	30	53	8	108	42	16	199	18	56	517	107
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	37	30	53	8	108	42	16	199	18	56	517	107
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	42	34	60	9	122	47	18	225	20	63	584	121
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	42	34	60	9	122	47	18	225	20	63	584	121
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	42	34	60	9	122	47	18	225	20	63	584	121
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.45	0.45	0.45	0.60	0.60	0.60	0.64	0.64	0.64	0.57	0.57	0.57
Lanes:	0.31	0.25	0.44	0.05	0.69	0.26	0.07	0.85	0.08	0.08	0.76	0.16
Final Sat.:	263	213	376	58	782	301	83	1042	93	89	821	170
Capacity Analysis Module:												
Vol/Sat:	0.16	0.16	0.16	0.16	0.16	0.16	0.22	0.22	0.22	0.71	0.71	0.71
Crit Moves:		****									****	
Green/Cycle:	0.16	0.16	0.16	0.16	0.16	0.16	0.70	0.70	0.70	0.70	0.70	0.70
Volume/Cap:	1.02	1.02	1.02	0.99	0.99	0.99	0.31	0.31	0.31	1.02	1.02	1.02
Level Of Service Module:												
Delay/Veh:	83.9	83.9	83.9	67.8	67.8	67.8	2.5	2.5	2.5	36.4	36.4	36.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	83.9	83.9	83.9	67.8	67.8	67.8	2.5	2.5	2.5	36.4	36.4	36.4
AustraQueue:	2	2	3	1	5	2	0	1	0	3	16	5

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #20 B St/Willamina

Cycle (sec): 1 Critical Vol./Cap. (X): 0.300
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 2.3
Optimal Cycle: 0 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	0	1! 0	0	0	1! 0	0	0	1! 0	0	0	1! 0
Volume Module:												
Base Vol:	6	42	11	64	39	10	7	30	5	9	37	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	42	11	64	39	10	7	30	5	9	37	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	7	47	12	72	44	11	8	34	6	10	41	77
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	7	47	12	72	44	11	8	34	6	10	41	77
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	7	47	12	72	44	11	8	34	6	10	41	77
Saturation Flow Module:												
Sat/Lane:	478	478	478	687	687	687	483	483	483	427	427	427
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.11	0.71	0.18	0.57	0.34	0.09	0.17	0.71	0.12	0.08	0.32	0.60
Final Sat.:	51	340	87	389	238	60	81	342	60	33	137	257
Capacity Analysis Module:												
Vol/Sat:	0.14	0.14	0.14	0.18	0.18	0.18	0.10	0.10	0.10	0.30	0.30	0.30
Crit Moves:			****		****				****			****
ApproachV/S:		0.14			0.18			0.10			0.30	
Level Of Service Module:												
Delay/Veh:	1.7	1.7	1.7	2.0	2.0	2.0	1.5	1.5	1.5	3.1	3.1	3.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.7	1.7	1.7	2.0	2.0	2.0	1.5	1.5	1.5	3.1	3.1	3.1
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:		1.7			2.0			1.5			3.1	
LOS by Appr:		A			A			A			A	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #25 Main St/23rd Av

Average Delay (sec/veh): 1.2 Worst Case Level Of Service: A

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Uncontrolled						Uncontrolled						Stop Sign						Stop Sign					
Rights:	Include						Include						Include						Include					
Lanes:	0	1	0	0	0		0	0	0	1	0		0	0	1!	0	0		0	0	0	0	0	
Volume Module:																								
Base Vol:	117	144	0				0	103	26				12	0	41				0	0	0			
Growth Adj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
Initial Bse:	117	144	0				0	103	26				12	0	41				0	0	0			
User Adj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
PHF Adj:	0.95	0.95	0.95				0.95	0.95	0.95				0.95	0.95	0.95				0.95	0.95	0.95			
PHF Volume:	123	152	0				0	109	27				13	0	43				0	0	0			
Reduct Vol:	0	0	0				0	0	0				0	0	0				0	0	0			
Final Vol.:	123	152	0				0	109	27				13	0	43				0	0	0			
Adjusted Volume Module:																								
Grade:	0%						0%						0%						0%					
% Cycle/Cars:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
% Truck/Comb:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
PCE Adj:	1.10	1.00	1.00				1.10	1.00	1.00				1.10	1.10	1.10				1.10	1.10	1.10			
Cycl/Car PCE:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
Trck/Cmb PCE:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
Adj Vol.:	136	152	0				0	109	27				14	0	48				0	0	0			
Critical Gap Module:																								
MoveUp Time:	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx							3.4	xxxx		2.6	xxxxx	xxxx	xxxxx					
Critical Gp:	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx							6.5	xxxx		5.5	xxxxx	xxxx	xxxxx					
Capacity Module:																								
Cnflict Vol:	136	xxxx	xxxxx	xxxx	xxxx	xxxxx							397	xxxx		122	xxxx	xxxx	xxxxx					
Potent Cap.:	1477	xxxx	xxxxx	xxxx	xxxx	xxxxx							623	xxxx		1201	xxxx	xxxx	xxxxx					
Adj Cap:	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx							0.90	xxxx		1.00	xxxx	xxxx	xxxxx					
Move Cap.:	1477	xxxx	xxxxx	xxxx	xxxx	xxxxx							561	xxxx		1201	xxxx	xxxx	xxxxx					
Level Of Service Module:																								
Stopped Del:	2.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx							6.6	xxxx		3.1	xxxxx	xxxx	xxxxx					
LOS by Move:	A	*	*	*	*	*							A	*		*	*	*	*					
Movement:	LT	-	LTR	-	RT								LT	-	LTR	-	RT							
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx							xxxx	954	xxxxx	xxxx	xxxx	xxxxx						
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx							xxxxx	3.9	xxxxx	xxxxx	xxxx	xxxxx						
Shared LOS:	*	*	*	*	*	*							*	A	*	*	*	*						
ApproachDel:	1.3			0.0									3.9			0.0								

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #28 Highway 47/Elm St

Average Delay (sec/veh): 2.3 Worst Case Level Of Service: C

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Stop Sign						Stop Sign						Uncontrolled						Uncontrolled					
Rights:	Include						Include						Include						Include					
Lanes:	1	0	0	1	0		1	0	0	1	0		1	0	0	1	0		1	0	0	1	0	
Volume Module:																								
Base Vol:	6	47	18				30	18	70				56	264	19				19	500	48			
Growth Adj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
Initial Bse:	6	47	18				30	18	70				56	264	19				19	500	48			
User Adj:	1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00				1.00	1.00	1.00			
PHF Adj:	0.91	0.91	0.91				0.91	0.91	0.91				0.91	0.91	0.91				0.91	0.91	0.91			
PHF Volume:	7	52	20				33	20	77				62	291	21				21	552	53			
Reduct Vol:	0	0	0				0	0	0				0	0	0				0	0	0			
Final Vol.:	7	52	20				33	20	77				62	291	21				21	552	53			
Adjusted Volume Module:																								
Grade:	0%						0%						0%						0%					
% Cycle/Cars:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
% Truck/Comb:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
PCE Adj:	1.10	1.10	1.10				1.10	1.10	1.10				1.10	1.00	1.00				1.10	1.00	1.00			
Cycl/Car PCE:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
Trck/Cmb PCE:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
Adj Vol.:	7	57	22				36	22	85				68	291	21				23	552	53			
Critical Gap Module:																								
MoveUp Time:	3.4	3.3	2.6				3.4	3.3	2.6				2.1	xxxx	xxxxx				2.1	xxxx	xxxxx			
Critical Gp:	6.5	6.0	5.5				6.5	6.0	5.5				5.0	xxxx	xxxxx				5.0	xxxx	xxxxx			
Capacity Module:																								
Cnflict Vol:	1012	990	302				999	974	578				605	xxxx	xxxxx				312	xxxx	xxxxx			
Potent Cap.:	275	330	974				280	336	705				883	xxxx	xxxxx				1217	xxxx	xxxxx			
Adj Cap:	0.77	0.91	1.00				0.78	0.91	1.00				1.00	xxxx	xxxxx				1.00	xxxx	xxxxx			
Move Cap.:	212	299	974				217	305	705				883	xxxx	xxxxx				1217	xxxx	xxxxx			
Level Of Service Module:																								
Stopped Del:	17.5	14.6	3.8				19.6	12.6	5.7				4.4	xxxx	xxxxx				3.0	xxxx	xxxxx			
LOS by Move:	C	*	*				C	*	*				A	*	*				A	•	*			
Movement:	LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT		LT	-	LTR	-	RT	
Shared Cap.:	xxxx	xxxx	370				xxxx	xxxx	556				xxxx	xxxx	xxxxx				xxxx	xxxx	xxxxx			
Shrd StpDel:	xxxxx	xxxx	11.6				xxxxx	xxxx	7.1				xxxxx	xxxx	xxxxx				xxxxx	xxxx	xxxxx			
Shared LOS:	*	*	C				*	*	B				*	*	*				*	*	*			
ApproachDel:	12.1						10.3						0.8						0.1					

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Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #29 Gales Crk Rd/Willamina

Average Delay (sec/veh): 0.4 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1	0	1 0	1	0 0	0 0	0	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	0	259	40	31	114	0	0	0	0	3	0	9
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	259	40	31	114	0	0	0	0	3	0	9
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	280	43	34	123	0	0	0	0	3	0	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	280	43	34	123	0	0	0	0	3	0	10
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	0	280	43	37	123	0	0	0	0	4	0	11
Critical Gap Module:												
MoveUp Time:	xxxxx	xxxx	xxxxx	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6
Critical Gp:	xxxxx	xxxx	xxxxx	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	323	xxxx	xxxxx	xxxx	xxxx	xxxxx	458	xxxx	302
Potent Cap.:	xxxx	xxxx	xxxxx	1202	xxxx	xxxxx	xxxx	xxxx	xxxxx	575	xxxx	974
Adj Cap:	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.97	xxxx	1.00
Move Cap.:	xxxx	xxxx	xxxxx	1202	xxxx	xxxxx	xxxx	xxxx	xxxxx	557	xxxx	974
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	3.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	3.7
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	-	LTR - RT	LT	-	LTR - RT	LT	-	LTR - RT	LT	-	LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	820	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.4	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	A	*
ApproachDel:	0.0			0.7			0.0			4.4		

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #31 Thatcher Rd/Gales Crk Rd

Average Delay (sec/veh): 2.5 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	0	0 0	0 0	1!	0 0	1 0	1	0 0	0 0	0	1 0
Volume Module:												
Base Vol:	0	0	0	120	0	52	25	165	0	0	339	102
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	120	0	52	25	165	0	0	339	102
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
PHF Volume:	0	0	0	140	0	60	29	192	0	0	394	119
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	140	0	60	29	192	0	0	394	119
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	0	0	0	153	0	67	32	192	0	0	394	119
Critical Gap Module:												
MoveUp Time:	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Critical Gp:	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	674	xxxx	453	513	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	431	xxxx	816	977	xxxx	xxxxx	xxxx	xxxx	xxxxx
Adj Cap:	xxxx	xxxx	xxxxx	0.97	xxxx	1.00	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	417	xxxx	816	977	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	13.0	xxxx	4.8	3.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	-	LTR - RT	LT	-	LTR - RT	LT	-	LTR - RT	LT	-	LTR - RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	489	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	10.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	C	*	*	*	*	*	*	*
ApproachDel:	0.0			10.5			0.5			0.0		

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #32 Gales Creek Rd/Forest Gale Dr

Average Delay (sec/veh): 1.3 Worst Case Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	1 0	0	1 0	1 0	0	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	4	0	13	60	3	1	1	70	2	27	116	128
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	0	13	60	3	1	1	70	2	27	116	128
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	4	0	14	66	3	1	1	77	2	30	128	141
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	4	0	14	66	3	1	1	77	2	30	128	141
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		0.00	0.86		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		0.12	0.02		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	xxxx	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		0.50	1.00		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		1.50	2.00		xxxx	xxxx	
Adj Vol.:	5	0	16	73	4	1	1	77	2	33	128	141
Critical Gap Module:												
MoveUp Time:	3.4	xxxx	2.6	3.4	3.3	2.6	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx
Critical Gp:	6.5	xxxx	5.5	6.5	6.0	5.5	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	309	xxxx	78	314	308	198	269	xxxx	xxxxx	79	xxxx	xxxxx
Potent Cap.:	701	xxxx	1264	696	752	1099	1277	xxxx	xxxxx	1571	xxxx	xxxxx
Adj Cap:	0.98	xxxx	1.00	0.97	0.98	1.00	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx
Move Cap.:	686	xxxx	1264	676	735	1099	1277	xxxx	xxxxx	1571	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	5.3	xxxx	2.9	5.9	4.9	3.3	2.8	xxxx	xxxxx	2.3	xxxx	xxxxx
LOS by Move:	B	*	*	B	*	*	A	*	*	A	*	*
Movement:	LT	- LTR	- RT	LT	- LTR	- RT	LT	- LTR	- RT	LT	- LTR	- RT
Shared Cap.:	xxxx	xxxx	1264	xxxx	xxxx	802	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	2.9	xxxxx	xxxx	4.5	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	A	*	*	A	*	*	*	*	*	*
ApproachDel:		3.4			5.8			0.0			0.3	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #33 Thatcher Rd/Watercrest Rd

Average Delay (sec/veh): 6.4 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 1	0	0 0	0 0	1!	0 0	0 0	1!	0 0	0 0	0	1 0
Volume Module:												
Base Vol:	25	96	0	296	131	67	29	84	24	0	159	311
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	25	96	0	296	131	67	29	84	24	0	159	311
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	27	102	0	316	140	72	31	90	26	0	170	332
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	27	102	0	316	140	72	31	90	26	0	170	332
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	29	102	0	347	140	72	34	99	28	0	187	365
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx	3.4	3.3	2.6	xxxxx	3.3	2.6
Critical Gp:	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx	6.5	6.0	5.5	xxxxx	6.0	5.5
Capacity Module:												
Cnflict Vol:	211	xxxx	xxxxx	102	xxxx	xxxxx	871	621	176	xxxx	656	102
Potent Cap.:	1360	xxxx	xxxxx	1532	xxxx	xxxxx	331	515	1128	xxxx	494	1229
Adj Cap:	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx	0.33	0.72	1.00	xxxx	0.72	1.00
Move Cap.:	1360	xxxx	xxxxx	1532	xxxx	xxxxx	110	373	1128	xxxx	357	1229
Level Of Service Module:												
Stopped Del:	2.7	xxxx	xxxxx	3.0	xxxx	xxxxx	45.2	12.7	3.3	xxxxx	19.1	4.0
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	- LTR	- RT	LT	- LTR	- RT	LT	- LTR	- RT	LT	- LTR	- RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	269	xxxxx	xxxx	xxxx	673
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	17.9	xxxxx	xxxxx	xxxx	9.1
Shared LOS:	*	*	*	*	*	*	*	C	*	*	*	B
ApproachDel:		0.6			1.8			17.9			9.1	

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PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #39 Sunset/Willamina

Average Delay (sec/veh): 2.3 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	67	362	12	28	285	131	69	4	31	17	16	24
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	67	362	12	28	285	131	69	4	31	17	16	24
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	70	380	13	29	299	138	72	4	33	18	17	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	70	380	13	29	299	138	72	4	33	18	17	25
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	77	380	13	32	299	138	80	5	36	20	18	28
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx	3.4	3.3	2.6	3.4	3.3	2.6
Critical Gp:	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx	6.5	6.0	5.5	6.5	6.0	5.5
Capacity Module:												
Cnflict Vol:	437	xxxx	xxxxx	393	xxxx	xxxxx	876	861	368	873	923	387
Potent Cap.:	1061	xxxx	xxxxx	1114	xxxx	xxxxx	329	386	901	331	357	882
Adj Cap:	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx	0.83	0.87	1.00	0.86	0.87	1.00
Move Cap.:	1061	xxxx	xxxxx	1114	xxxx	xxxxx	274	335	901	283	311	882
Level Of Service Module:												
Stopped Del:	3.6	xxxx	xxxxx	3.3	xxxx	xxxxx	17.8	10.9	4.1	13.6	12.2	4.2
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	349	xxxxx	xxxx	411	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	13.5	xxxxx	xxxxx	9.3	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	B	*
ApproachDel:		0.6			0.2			13.5			9.3	

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Forest Grove TSP Update
Future Decoupling Conditions (No Left Turn Lanes)
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Lane Geometry Report

Number of approach lanes: (L) (LT) (T) (RT) (R) (LTR)

Node	Intersection	NB	SB	EB	WB
1	E St/Pacific Ave	101000	000100	100010	000000
2	B St/Pacific Av	000001	000100	100100	100100
3	B Ave/19th Street	010010	100100	000001	000001
5	Council St/19th Ave	000000	000000	010000	000100
6	Elm St/19th Ave	010010	010000	000001	000001
8	Maple St/Pacific Av	100010	000000	001100	102000
9	Maple St/Hwy 47	000001	000001	100100	100100
10	Hwy 47-Quince/Pacific Ave	101010	101010	102010	101100
13	Elm St/Pacific Av	000001	000100	000100	000001
14	College-Council/Pacific Av	100100	000001	010000	000100
15	Main St/Pacific Av	000001	000001	000001	000001
20	B St/Willamina	000001	000001	000001	000001
25	Main St/23rd Av	010000	000100	000001	000000
28	Highway 47/Elm St	100100	100100	100100	100100
29	Gales Crk Rd/Willamina	000100	101000	000000	000001
31	Thatcher Rd/Gales Crk Rd	000000	000001	101000	000100
32	Gales Creek Rd/Forest Gale Dr	100100	100100	100100	100100
33	Thatcher Rd/Watercrest Rd	010000	000001	000001	000100
39	Sunset/Willamina	000001	000001	000001	000001

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Forest Grove TSP Update
Future Decoupling Conditions with Left Turns
PM Peak Hour

Intersection Volume Report
Base Volume Alternative

Node	Intersection	Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R
1	E St/Pacific	64	385	0	0	298	2	10	0	150	0	0	0
2	B St/Pacific	171	34	11	0	80	7	11	223	162	98	452	30
3	B Ave/19th St	6	110	0	220	179	3	1	14	7	122	0	82
5	Council St/19	0	0	0	0	0	0	85	488	0	0	210	162
6	Elm St/19th A	93	19	63	4	66	0	6	627	55	17	419	1
8	Maple St/Paci	133	0	119	0	0	0	0	1176	128	174	1205	0
9	Maple St/Hwy	68	96	108	47	63	75	49	367	59	118	413	67
10	Hwy 47-Quince	39	235	327	347	270	115	43	975	84	356	1199	483
13	Elm St/Pacifi	26	28	4	0	15	1	0	437	1	34	669	3
14	College-Counc	131	124	2	99	0	51	26	234	0	0	537	51
15	Main St/Pacif	37	30	53	8	108	42	16	199	18	56	517	107
20	B St/Willamin	6	42	11	64	39	10	7	30	5	9	37	69
25	Main St/23rd	117	144	0	0	103	26	12	0	41	0	0	0
28	Highway 47/El	6	47	18	30	18	70	56	264	19	19	500	48
29	Gales Crk Rd/	0	259	40	31	114	0	0	0	0	3	0	9
31	Thatcher Rd/G	0	0	0	120	0	52	25	165	0	0	339	102
32	Gales Creek R	4	0	13	60	3	1	1	70	2	27	116	128
33	Thatcher Rd/W	25	96	0	296	131	67	29	84	24	0	159	311
39	Sunset/Willam	67	362	12	28	285	131	69	4	31	17	16	24

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Future Decoupling Conditions with Left Turns
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Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 E St/Pacific Ave	C	1.2	0.000	C	1.2	0.000	+ 0.000 V/C
# 2 B St/Pacific Av	C	15.6	0.687	C	15.6	0.687	+ 0.000 D/V
# 3 B Ave/19th Street	B	5.9	0.729	B	5.9	0.729	+ 0.000 V/C
# 5 Council St/19th Ave	A	0.3	0.000	A	0.3	0.000	+ 0.000 V/C
# 6 Elm St/19th Ave	B	5.8	0.586	B	5.8	0.586	+ 0.000 D/V
# 8 Maple St/Pacific Av	B	8.0	0.725	B	8.0	0.725	+ 0.000 D/V
# 9 Maple St/Hwy 47	C	16.0	0.673	C	16.0	0.673	+ 0.000 D/V
# 10 Hwy 47-Quince/Pacific Ave	D	35.8	1.043	D	35.8	1.043	+ 0.000 D/V
#13 Elm St/Pacific Av	A	2.9	0.520	A	2.9	0.520	+ 0.000 D/V
#14 College-Council/Pacific Av	D	30.5	0.989	D	30.5	0.989	+ 0.000 D/V
#15 Main St/Pacific Av	B	13.1	0.827	B	13.1	0.827	+ 0.000 D/V
# 20 B St/Willamina	A	2.3	0.300	A	2.3	0.300	+ 0.000 V/C
# 25 Main St/23rd Av	A	1.2	0.000	A	1.2	0.000	+ 0.000 V/C
# 28 Highway 47/Elm St	B	6.8	0.471	B	6.8	0.471	+ 0.000 D/V
# 29 Gales Crk Rd/Willamina	A	0.4	0.000	A	0.4	0.000	+ 0.000 V/C
# 31 Thatcher Rd/Gales Crk Rd	C	2.5	0.000	C	2.5	0.000	+ 0.000 V/C
# 32 Gales Creek Rd/Forest Gale Dr	B	1.3	0.000	B	1.3	0.000	+ 0.000 V/C
# 33 Thatcher Rd/Watercrest Rd	C	6.4	0.000	C	6.4	0.000	+ 0.000 V/C
# 39 Sunset/Willamina	B	9.8	0.645	B	9.8	0.645	+ 0.000 V/C

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Forest Grove TSP Update
Future Decoupling Conditions with Left Turns
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #1 E St/Pacific Ave

Average Delay (sec/veh): 1.2 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	1 0	1	0 0	0 0	0	1 0	1 0	0	0 1	0 0	0	0 0
Volume Module:												
Base Vol:	64	385	0	0	298	2	10	0	150	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	64	385	0	0	298	2	10	0	150	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	69	416	0	0	322	2	11	0	162	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	69	416	0	0	322	2	11	0	162	0	0	0
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	76	416	0	0	322	2	12	0	178	0	0	0
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	xxxxx	xxxx	xxxxx
Critical Gp:	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	324	xxxx	xxxxx	xxxx	xxxx	xxxxx	808	xxxx	323	xxxx	xxxx	xxxxx
Potent Cap.:	1201	xxxx	xxxxx	xxxx	xxxx	xxxxx	361	xxxx	950	xxxx	xxxx	xxxxx
Adj Cap:	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.94	xxxx	1.00	xxxx	xxxx	xxxxx
Move Cap.:	1201	xxxx	xxxxx	xxxx	xxxx	xxxxx	338	xxxx	950	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	3.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	11.0	xxxx	4.6	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	C	*	A	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	0.5			0.0			5.0			0.0		

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Forest Grove TSP Update
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PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #2 B St/Pacific Av

Cycle (sec): 80 Critical Vol./Cap. (X): 0.687
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 15.6
Optimal Cycle: 55 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	1!	0 0	0 0	0	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	171	34	11	0	80	7	11	223	162	98	452	30
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	171	34	11	0	80	7	11	223	162	98	452	30
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	190	38	12	0	89	8	12	248	180	109	503	33
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	190	38	12	0	89	8	12	248	180	109	503	33
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	190	38	12	0	89	8	12	248	180	109	503	33
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.53	0.53	0.53	1.00	0.78	0.78	0.83	0.81	0.81	0.83	0.85	0.85
Lanes:	0.79	0.16	0.05	0.00	0.92	0.08	1.00	0.58	0.42	1.00	0.94	0.06
Final Sat.:	803	161	51	0	1356	122	1577	890	646	1577	1518	100
Capacity Analysis Module:												
Vol/Sat:	0.24	0.24	0.24	0.00	0.07	0.07	0.01	0.28	0.28	0.07	0.33	0.33
Crit Moves:		****						****		****		
Green/Cycle:	0.34	0.34	0.34	0.00	0.34	0.34	0.01	0.41	0.41	0.10	0.49	0.49
Volume/Cap:	0.69	0.69	0.69	0.00	0.19	0.19	0.67	0.69	0.69	0.69	0.67	0.67
Level Of Service Module:												
Delay/Veh:	18.4	18.4	18.4	0.0	11.9	11.9	65.2	14.9	14.9	30.3	11.4	11.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	18.4	18.4	18.4	0.0	11.9	11.9	65.2	14.9	14.9	30.3	11.4	11.4
AustraQueue:	4	1	1	0	1	0	1	5	4	3	9	1

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Level Of Service Computation Report
1994 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #3 B Ave/19th Street

Cycle (sec): 1 Critical Vol./Cap. (X): 0.729
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 5.9
Optimal Cycle: 0 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Ignore			Include			Include			Include		
Lanes:	0 1	0	0 1	1	0	0 1	0	0	1! 0	0	0	1! 0 0
Volume Module:												
Base Vol:	6	110	163	220	179	3	1	14	7	122	0	82
Growth Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	110	0	220	179	3	1	14	7	122	0	82
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.77	0.77	0.00	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
PHF Volume:	8	144	0	287	234	4	1	18	9	159	0	107
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	144	0	287	234	4	1	18	9	159	0	107
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	8	144	0	287	234	4	1	18	9	159	0	107
Saturation Flow Module:												
Sat/Lane:	305	305	305	462	462	462	156	156	156	365	365	365
Adjustment:	1.00	1.00	1.00	3.00	3.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.05	0.95	1.00	1.00	0.98	0.02	0.04	0.64	0.32	0.60	0.00	0.40
Final Sat.:	16	289	305	1386	1363	23	6	100	50	218	0	147
Capacity Analysis Module:												
Vol/Sat:	0.50	0.50	0.00	0.21	0.17	0.17	0.18	0.18	0.18	0.73	0.00	0.73
Crit Moves:		****		****					****			****
ApproachV/S:		0.25			0.19			0.18			0.73	
Level Of Service Module:												
Delay/Veh:	6.6	6.6	0.0	2.2	1.9	1.9	2.0	2.0	2.0	15.9	0.0	15.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.6	6.6	0.0	2.2	1.9	1.9	2.0	2.0	2.0	15.9	0.0	15.9
LOS by Move:	B	B	*	A	A	A	A	A	A	C	*	C
ApproachDel:		2.6			2.1			2.0			15.9	
LOS by Appr:		A			A			A			C	

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #5 Council St/19th Ave

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	0	0 0	0	0	0 0	1	0	1 0 0	0	0	0 1 0
Volume Module:												
Base Vol:	0	0	0	0	0	0	85	488	0	0	210	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	85	488	0	0	210	162
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	0	0	0	0	0	91	523	0	0	225	174
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	0	0	0	91	523	0	0	225	174
Adjusted Volume Module:												
Grade:		0%			0%			0%			0%	
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	0	0	0	0	0	0	100	523	0	0	225	174
Critical Gap Module:												
MoveUp Time:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	399	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1107	xxxx	xxxxx	xxxx	xxxx	xxxxx
Adj Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1107	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	●	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		0.0			0.0			0.6			0.0	

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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #6 Elm St/19th Ave

Cycle (sec): 55 Critical Vol./Cap. (X): 0.586
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 5.8
Optimal Cycle: 34 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1	0	0 1	0 1	0	0 0	1	0	0 1	0	0 1!	0 0
Volume Module:												
Base Vol:	93	19	63	4	66	0	6	627	55	17	419	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	93	19	63	4	66	0	6	627	55	17	419	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	105	21	71	5	74	0	7	707	62	19	472	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	105	21	71	5	74	0	7	707	62	19	472	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	105	21	71	5	74	0	7	707	62	19	472	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.86	0.86	0.84	0.94	0.94	1.00	0.79	0.96	0.96	0.77	0.77	0.77
Lanes:	0.83	0.17	1.00	0.06	0.94	0.00	1.00	0.92	0.08	0.03	0.96	0.01
Final Sat.:	1364	273	1599	113	1676	0	1509	1668	146	56	1394	3
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.04	0.04	0.04	0.00	0.00	0.42	0.42	0.34	0.34	0.34
Crit Moves:		****						****				
Green/Cycle:	0.13	0.13	0.13	0.13	0.13	0.00	0.72	0.72	0.72	0.72	0.72	0.72
Volume/Cap:	0.59	0.59	0.34	0.34	0.34	0.00	0.01	0.59	0.59	0.47	0.47	0.47
Level Of Service Module:												
Delay/Veh:	20.0	20.0	16.9	16.8	16.8	0.0	1.6	3.3	3.3	2.7	2.7	2.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.0	20.0	16.9	16.8	16.8	0.0	1.6	3.3	3.3	2.7	2.7	2.7
AustraQueue:	2	0	1	0	1	0	0	5	1	0	3	0

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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #8 Maple St/Pacific Av

Cycle (sec): 60 Critical Vol./Cap. (X): 0.725
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 8.0
Optimal Cycle: 54 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	0	0 1	0	0	0 0	0	1	1 0	1	0 2	0 0
Volume Module:												
Base Vol:	133	0	119	0	0	0	0	1176	128	174	1205	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	133	0	119	0	0	0	0	1176	128	174	1205	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	140	0	126	0	0	0	0	1241	135	184	1271	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	140	0	126	0	0	0	0	1241	135	184	1271	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.05	1.00
Final Vol.:	140	0	126	0	0	0	0	1303	142	184	1335	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.94	1.00	0.84	1.00	1.00	1.00	1.00	0.95	0.95	0.94	0.98	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.80	0.20	1.00	2.00	0.00
Final Sat.:	1787	0	1599	0	0	0	0	3266	356	1787	3732	0
Capacity Analysis Module:												
Vol/Sat:	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.40	0.40	0.10	0.36	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.55	0.55	0.14	0.69	0.00
Volume/Cap:	0.73	0.00	0.73	0.00	0.00	0.00	0.00	0.73	0.73	0.73	0.52	0.00
Level Of Service Module:												
Delay/Veh:	25.2	0.0	26.4	0.0	0.0	0.0	0.0	7.5	7.5	22.6	3.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.2	0.0	26.4	0.0	0.0	0.0	0.0	7.5	7.5	22.6	3.0	0.0
AustraQueue:	3	0	3	0	0	0	0	17	2	4	11	0

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Level Of Service Computation Report
1985 HCM Operations Method (Base Volume Alternative)

Intersection #9 Maple St/Hwy 47

Cycle (sec): 80 Critical Vol./Cap. (X): 0.673
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 16.0
Optimal Cycle: 53 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1! 0	0	0	1! 0	0	1	0	1	0	1	0
Volume Module:												
Base Vol:	68	96	108	47	63	75	49	367	59	118	413	67
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	68	96	108	47	63	75	49	367	59	118	413	67
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
PHF Volume:	77	109	123	53	72	85	56	417	67	134	469	76
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	77	109	123	53	72	85	56	417	67	134	469	76
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	77	109	123	53	72	85	56	417	67	134	469	76
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.78	0.78	0.78	0.71	0.71	0.71	0.95	0.98	0.98	0.95	0.98	0.98
Lanes:	0.25	0.35	0.40	0.25	0.34	0.41	1.00	0.86	0.14	1.00	0.86	0.14
Final Sat.:	351	497	560	324	441	520	1710	1520	244	1710	1518	246
Capacity Analysis Module:												
Vol/Sat:	0.22	0.22	0.22	0.16	0.16	0.16	0.03	0.27	0.27	0.08	0.31	0.31
Crit Moves:		****						****		****		
Green/Cycle:	0.33	0.33	0.33	0.33	0.33	0.33	0.05	0.41	0.41	0.12	0.47	0.47
Volume/Cap:	0.67	0.67	0.67	0.50	0.50	0.50	0.65	0.67	0.67	0.67	0.65	0.65
Level Of Service Module:												
Delay/Veh:	20.4	20.4	20.4	17.3	17.3	17.3	39.0	16.4	16.4	31.6	13.5	13.5
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ProgAdjFctr:	0.85	0.85	0.85	0.85	0.85	0.85	1.00	0.85	0.85	1.00	0.85	0.85
AdjDel/Veh:	17.3	17.3	17.3	14.7	14.7	14.7	39.0	14.0	14.0	31.6	11.5	11.5
AustraQueue:	6	6	6	4	4	4	2	9	9	3	10	10

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PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #10 Hwy 47-Quince/Pacific Ave

Cycle (sec): 80 Critical Vol./Cap. (X): 1.043
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 35.8
Optimal Cycle: 172 Level Of Service: D

Approach:	North Bound			South Bound			East Bound				West Bound			
Movement:	L	T	R	L	T	R	L	T	R		L	T	R	
Control:	Protected			Protected			Protected				Protected			
Rights:	Ovl			Include			Include				Include			
Min. Green:	0	0	0	0	0	0	0	0	0		0	0	0	
Lanes:	1	0	1	0	1	1	0	1	0	1	1	0	2	0	1	
Volume Module:																
Base Vol:	39	235	327	347	270	115	43	975	84		356	1199	483	
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	39	235	327	347	270	115	43	975	84		356	1199	483	
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		0.96	0.96	0.96	
PHF Volume:	40	244	340	360	280	119	45	1012	87		370	1245	502	
Reduct Vol:	0	0	0	0	0	0	0	0	0		0	0	0	
Reduced Vol:	40	244	340	360	280	119	45	1012	87		370	1245	502	
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00		1.00	1.05	1.00	
Final Vol.:	40	244	340	360	280	119	45	1063	87		370	1307	502	
Saturation Flow Module:														
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900		1900	1900	1900	
Adjustment:	0.90	0.95	0.81	0.91	0.96	0.82	0.93	0.98	0.83		0.94	0.99	0.84	
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00		1.00	2.00	1.00	
Final Sat.:	1719	1810	1538	1736	1827	1553	1770	3725	1583		1787	3762	1599	
Capacity Analysis Module:														
Vol/Sat:	0.02	0.13	0.22	0.21	0.15	0.08	0.03	0.29	0.05		0.21	0.35	0.31	
Crit Moves:		****		****				****			****			
Green/Cycle:	0.04	0.13	0.33	0.20	0.28	0.28	0.03	0.27	0.27		0.20	0.44	0.44	
Volume/Cap:	0.54	1.04	0.67	1.04	0.54	0.27	0.79	1.04	0.20		1.04	0.79	0.71	
Level Of Service Module:														
Delay/Veh:	29.8	81.6	17.5	71.1	16.5	14.4	57.8	52.4	14.5		70.5	14.3	14.2	
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
AdjDel/Veh:	29.8	81.6	17.5	71.1	16.5	14.4	57.8	52.4	14.5		70.5	14.3	14.2	
AustraQueue:	1	10	7	14	5	2	2	36	1		15	26	10	

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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #13 Elm St/Pacific Av

Cycle (sec): 55 Critical Vol./Cap. (X): 0.520
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 2.9
Optimal Cycle: 31 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1! 0	0	0	1	0	0	1	0	1	0
Volume Module:												
Base Vol:	26	28	4	0	15	1	0	437	1	34	669	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	26	28	4	0	15	1	0	437	1	34	669	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	28	31	4	0	16	1	0	478	1	37	731	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	28	31	4	0	16	1	0	478	1	37	731	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	28	31	4	0	16	1	0	478	1	37	731	3
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.84	0.84	0.84	1.00	0.86	0.86	1.00	0.90	0.90	0.60	0.96	0.96
Lanes:	0.44	0.50	0.06	0.00	0.94	0.06	0.00	0.99	0.01	1.00	0.99	0.01
Final Sat.:	707	783	101	0	1545	97	0	1706	4	1144	1808	7
Capacity Analysis Module:												
Vol/Sat:	0.04	0.04	0.04	0.00	0.01	0.01	0.00	0.28	0.28	0.03	0.40	0.40
Crit Moves:		****									****	
Green/Cycle:	0.08	0.08	0.08	0.00	0.08	0.08	0.00	0.78	0.78	0.78	0.78	0.78
Volume/Cap:	0.52	0.52	0.52	0.00	0.14	0.14	0.00	0.36	0.36	0.04	0.52	0.52
Level Of Service Module:												
Delay/Veh:	21.7	21.7	21.7	0.0	18.1	18.1	0.0	1.5	1.5	1.1	2.0	2.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	21.7	21.7	21.7	0.0	18.1	18.1	0.0	1.5	1.5	1.1	2.0	2.0
AustraQueue:	1	1	0	0	0	0	0	2	0	0	4	0

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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #14 College-Council/Pacific Av

Cycle (sec): 80 Critical Vol./Cap. (X): 0.989
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 30.5
Optimal Cycle: 143 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	0	1! 0	0	1	0 1	0	0	1 0
Volume Module:												
Base Vol:	131	124	2	99	0	51	26	234	0	0	537	51
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	131	124	2	99	0	51	26	234	0	0	537	51
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
PHF Volume:	166	157	3	125	0	64	33	296	0	0	679	64
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	166	157	3	125	0	64	33	296	0	0	679	64
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	166	157	3	125	0	64	33	296	0	0	679	64
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.57	0.78	0.78	0.48	1.00	0.48	0.41	0.90	1.00	1.00	0.62	0.62
Lanes:	1.00	0.98	0.02	0.66	0.00	0.34	1.00	1.00	0.00	0.00	0.91	0.09
Final Sat.:	1085	1459	28	601	0	308	787	1710	0	0	1073	101
Capacity Analysis Module:												
Vol/Sat:	0.15	0.11	0.11	0.21	0.00	0.21	0.04	0.17	0.00	0.00	0.63	0.63
Crit Moves:				****							****	
Green/Cycle:	0.21	0.21	0.21	0.21	0.00	0.21	0.64	0.64	0.00	0.00	0.64	0.64
Volume/Cap:	0.73	0.51	0.51	0.99	0.00	0.99	0.07	0.27	0.00	0.00	0.99	0.99
Level Of Service Module:												
Delay/Veh:	29.8	22.4	22.4	70.8	0.0	70.8	4.1	4.8	0.0	0.0	33.5	33.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	29.8	22.4	22.4	70.8	0.0	70.8	4.1	4.8	0.0	0.0	33.5	33.5
AustraQueue:	4	3	0	5	0	3	0	3	0	0	21	3

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Forest Grove TSP Update
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #15 Main St/Pacific Av

Cycle (sec): 55 Critical Vol./Cap. (X): 0.827
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 13.1
Optimal Cycle: 59 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1! 0	0	0	1! 0	0	0	1! 0	0	1	0 0 1 0
Volume Module:												
Base Vol:	37	30	53	8	108	42	16	199	18	56	517	107
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	37	30	53	8	108	42	16	199	18	56	517	107
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	42	34	60	9	122	47	18	225	20	63	584	121
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	42	34	60	9	122	47	18	225	20	63	584	121
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	42	34	60	9	122	47	18	225	20	63	584	121
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.48	0.48	0.48	0.60	0.60	0.60	0.66	0.66	0.66	0.58	0.67	0.67
Lanes:	0.31	0.25	0.44	0.05	0.69	0.26	0.07	0.85	0.08	1.00	0.83	0.17
Final Sat.:	283	229	405	58	782	301	85	1068	95	1106	1060	220
Capacity Analysis Module:												
Vol/Sat:	0.15	0.15	0.15	0.16	0.16	0.16	0.21	0.21	0.21	0.06	0.55	0.55
Crit Moves:					****						****	
Green/Cycle:	0.19	0.19	0.19	0.19	0.19	0.19	0.67	0.67	0.67	0.67	0.67	0.67
Volume/Cap:	0.79	0.79	0.79	0.83	0.83	0.83	0.32	0.32	0.32	0.09	0.83	0.83
Level Of Service Module:												
Delay/Veh:	30.1	30.1	30.1	31.6	31.6	31.6	3.0	3.0	3.0	2.5	9.9	9.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.1	30.1	30.1	31.6	31.6	31.6	3.0	3.0	3.0	2.5	9.9	9.9
AustraQueue:	1	1	2	1	3	2	0	1	0	0	8	2

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Forest Grove TSP Update
Future Decoupling Conditions with Left Turns
PM Peak Hour

Level Of Service Computation Report
1994 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #20 B St/Willamina

Cycle (sec): 1 Critical Vol./Cap. (X): 0.300
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 2.3
Optimal Cycle: 0 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	0	1! 0	0	0	1! 0	0	0	1! 0	0	0	1! 0 0
Volume Module:												
Base Vol:	6	42	11	64	39	10	7	30	5	9	37	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	42	11	64	39	10	7	30	5	9	37	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	7	47	12	72	44	11	8	34	6	10	41	77
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	7	47	12	72	44	11	8	34	6	10	41	77
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	7	47	12	72	44	11	8	34	6	10	41	77
Saturation Flow Module:												
Sat/Lane:	478	478	478	687	687	687	483	483	483	427	427	427
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.11	0.71	0.18	0.57	0.34	0.09	0.17	0.71	0.12	0.08	0.32	0.60
Final Sat.:	51	340	87	389	238	60	81	342	60	33	137	257
Capacity Analysis Module:												
Vol/Sat:	0.14	0.14	0.14	0.18	0.18	0.18	0.10	0.10	0.10	0.30	0.30	0.30
Crit Moves:			****		****				****			****
ApproachV/S:		0.14			0.18			0.10			0.30	
Level Of Service Module:												
Delay/Veh:	1.7	1.7	1.7	2.0	2.0	2.0	1.5	1.5	1.5	3.1	3.1	3.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.7	1.7	1.7	2.0	2.0	2.0	1.5	1.5	1.5	3.1	3.1	3.1
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:		1.7			2.0			1.5			3.1	
LOS by Appr:		A			A			A			A	

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Forest Grove TSP Update
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #25 Main St/23rd Av

Average Delay (sec/veh): 1.2 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 1	0	0	0	0 1	0	0	0 1!	0 0	0	0 0	0
Volume Module:												
Base Vol:	117	144	0	0	103	26	12	0	41	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	117	144	0	0	103	26	12	0	41	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	123	152	0	0	109	27	13	0	43	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	123	152	0	0	109	27	13	0	43	0	0	0
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	136	152	0	0	109	27	14	0	48	0	0	0
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	xxxxx	xxxx	xxxxx
Critical Gp:	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	136	xxxx	xxxxx	xxxx	xxxx	xxxxx	397	xxxx	122	xxxx	xxxx	xxxxx
Potent Cap.:	1477	xxxx	xxxxx	xxxx	xxxx	xxxxx	623	xxxx	1201	xxxx	xxxx	xxxxx
Adj Cap:	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.90	xxxx	1.00	xxxx	xxxx	xxxxx
Move Cap.:	1477	xxxx	xxxxx	xxxx	xxxx	xxxxx	561	xxxx	1201	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	2.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.6	xxxx	3.1	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	954	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	3.9	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:		1.3			0.0			3.9			0.0	

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Forest Grove TSP Update
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Level Of Service Computation Report
1985 HCM Operations Method (Base Volume Alternative)

Intersection #28 Highway 47/Elm St

Cycle (sec): 80 Critical Vol./Cap. (X): 0.471
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 6.8
Optimal Cycle: 38 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	0	1	0	1 0	0	1	0	0 1	0	1 0	0 1 0
Volume Module:												
Base Vol:	6	47	18	30	18	70	56	264	19	19	500	48
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	47	18	30	18	70	56	264	19	19	500	48
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	7	52	20	33	20	77	62	291	21	21	552	53
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	7	52	20	33	20	77	62	291	21	21	552	53
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	7	52	20	33	20	77	62	291	21	21	552	53
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.95	0.96	0.96	0.95	0.88	0.88	0.42	0.99	0.99	0.62	0.99	0.99
Lanes:	1.00	0.72	0.28	1.00	0.21	0.79	1.00	0.93	0.07	1.00	0.91	0.09
Final Sat.:	1710	1248	480	1710	327	1257	756	1662	120	1116	1626	156
Capacity Analysis Module:												
Vol/Sat:	0.00	0.04	0.04	0.02	0.06	0.06	0.08	0.18	0.18	0.02	0.34	0.34
Crit Moves:		****		****							****	
Green/Cycle:	0.01	0.09	0.09	0.04	0.12	0.12	0.72	0.72	0.72	0.72	0.72	0.72
Volume/Cap:	0.50	0.47	0.47	0.47	0.50	0.50	0.11	0.24	0.24	0.03	0.47	0.47
Level Of Service Module:												
Delay/Veh:	48.3	28.1	28.1	32.1	26.8	26.8	2.6	2.9	2.9	2.4	3.8	3.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ProgAdjFctr:	1.00	0.85	0.85	1.00	0.85	0.85	1.00	0.85	0.85	1.00	0.85	0.85
AdjDel/Veh:	48.3	23.9	23.9	32.1	22.8	22.8	2.6	2.5	2.5	2.4	3.2	3.2
AustraQueue:	0	2	2	1	2	2	0	2	2	0	6	6

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #29 Gales Crk Rd/Willamina

Average Delay (sec/veh): 0.4 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	0 1	0	1 0	1 0	0	0 0	0 0	0	0 0	1! 0	0
Volume Module:												
Base Vol:	0	259	40	31	114	0	0	0	0	3	0	9
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	259	40	31	114	0	0	0	0	3	0	9
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	280	43	34	123	0	0	0	0	3	0	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	280	43	34	123	0	0	0	0	3	0	10
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	0	280	43	37	123	0	0	0	0	4	0	11
Critical Gap Module:												
MoveUp Time:	xxxxx	xxxx	xxxxx	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6
Critical Gp:	xxxxx	xxxx	xxxxx	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	323	xxxx	xxxxx	xxxx	xxxx	xxxxx	458	xxxx	302
Potent Cap.:	xxxx	xxxx	xxxxx	1202	xxxx	xxxxx	xxxx	xxxx	xxxxx	575	xxxx	974
Adj Cap:	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.97	xxxx	1.00
Move Cap.:	xxxx	xxxx	xxxxx	1202	xxxx	xxxxx	xxxx	xxxx	xxxxx	557	xxxx	974
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	3.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	3.7
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	820	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.4	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	A	*
ApproachDel:	0.0			0.7			0.0			4.4		

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #31 Thatcher Rd/Gales Crk Rd

Average Delay (sec/veh): 2.5 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	0 0	0	0 0	1! 0	0	1 0	1 0	0	0 0	0 1	0
Volume Module:												
Base Vol:	0	0	0	120	0	52	25	165	0	0	339	102
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	120	0	52	25	165	0	0	339	102
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
PHF Volume:	0	0	0	140	0	60	29	192	0	0	394	119
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	140	0	60	29	192	0	0	394	119
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	0	0	0	153	0	67	32	192	0	0	394	119
Critical Gap Module:												
MoveUp Time:	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Critical Gp:	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	674	xxxx	453	513	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	431	xxxx	816	977	xxxx	xxxxx	xxxx	xxxx	xxxxx
Adj Cap:	xxxx	xxxx	xxxxx	0.97	xxxx	1.00	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	417	xxxx	816	977	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	13.0	xxxx	4.8	3.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	489	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	10.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	C	*	*	*	*	*	*	*
ApproachDel:	0.0			10.5			0.5			0.0		

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #32 Gales Creek Rd/Forest Gale Dr

Average Delay (sec/veh): 1.3 Worst Case Level Of Service: B

Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Stop Sign					Stop Sign					Uncontrolled					Uncontrolled				
Rights:	Include					Include					Include					Include				
Lanes:	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0
Volume Module:																				
Base Vol:	4	0	13			60	3	1			1	70	2			27	116	128		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	4	0	13			60	3	1			1	70	2			27	116	128		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	0.91	0.91	0.91			0.91	0.91	0.91			0.91	0.91	0.91			0.91	0.91	0.91		
PHF Volume:	4	0	14			66	3	1			1	77	2			30	128	141		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Final Vol.:	4	0	14			66	3	1			1	77	2			30	128	141		
Adjusted Volume Module:																				
Grade:	0%					0%					0%					0%				
% Cycle/Cars:	xxxx	xxxx				xxxx	xxxx				0.00	0.86				xxxx	xxxx			
% Truck/Comb:	xxxx	xxxx				xxxx	xxxx				0.12	0.02				xxxx	xxxx			
PCE Adj:	1.10	1.10	1.10			1.10	1.10	1.10			xxxx	1.00	1.00			1.10	1.00	1.00		
Cycl/Car PCE:	xxxx	xxxx				xxxx	xxxx				0.50	1.00				xxxx	xxxx			
Trck/Cmb PCE:	xxxx	xxxx				xxxx	xxxx				1.50	2.00				xxxx	xxxx			
Adj Vol.:	5	0	16			73	4	1			1	77	2			33	128	141		
Critical Gap Module:																				
MoveUp Time:	3.4	xxxx	2.6			3.4	3.3	2.6			2.1	xxxx	xxxxx			2.1	xxxx	xxxxx		
Critical Gp:	6.5	xxxx	5.5			6.5	6.0	5.5			5.0	xxxx	xxxxx			5.0	xxxx	xxxxx		
Capacity Module:																				
Cnflict Vol:	309	xxxx	78			314	308	198			269	xxxx	xxxxx			79	xxxx	xxxxx		
Potent Cap.:	701	xxxx	1264			696	752	1099			1277	xxxx	xxxxx			1571	xxxx	xxxxx		
Adj Cap:	0.98	xxxx	1.00			0.97	0.98	1.00			1.00	xxxx	xxxxx			1.00	xxxx	xxxxx		
Move Cap.:	686	xxxx	1264			676	735	1099			1277	xxxx	xxxxx			1571	xxxx	xxxxx		
Level Of Service Module:																				
Stopped Del:	5.3	xxxx	2.9			5.9	4.9	3.3			2.8	xxxx	xxxxx			2.3	xxxx	xxxxx		
LOS by Move:	B	*	*			B	*	*			A	*	*			A	*	*		
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx	1264			xxxx	xxxx	802			xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx		
Shrd StpDel:	xxxxx	xxxx	2.9			xxxxx	xxxx	4.5			xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		
Shared LOS:	*	*	A			*	*	A			*	*	*			*	*	*		
ApproachDel:	3.4					5.8					0.0					0.3				

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #33 Thatcher Rd/Watercrest Rd

Average Delay (sec/veh): 6.4 Worst Case Level Of Service: C

Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	1	0	0	0	0	0	1!	0	0	0	0	1!	0	0	0	0	0	1	0
Volume Module:																				
Base Vol:	25	96	0			296	131	67			29	84	24			0	159	311		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	25	96	0			296	131	67			29	84	24			0	159	311		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	0.94	0.94	0.94			0.94	0.94	0.94			0.94	0.94	0.94			0.94	0.94	0.94		
PHF Volume:	27	102	0			316	140	72			31	90	26			0	170	332		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Final Vol.:	27	102	0			316	140	72			31	90	26			0	170	332		
Adjusted Volume Module:																				
Grade:	0%					0%					0%					0%				
% Cycle/Cars:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
% Truck/Comb:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
PCE Adj:	1.10	1.00	1.00			1.10	1.00	1.00			1.10	1.10	1.10			1.10	1.10	1.10		
Cycl/Car PCE:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
Trck/Cmb PCE:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
Adj Vol.:	29	102	0			347	140	72			34	99	28			0	187	365		
Critical Gap Module:																				
MoveUp Time:	2.1	xxxx	xxxxx			2.1	xxxx	xxxxx			3.4	3.3	2.6	xxxxx		3.3	2.6			
Critical Gp:	5.0	xxxx	xxxxx			5.0	xxxx	xxxxx			6.5	6.0	5.5	xxxxx		6.0	5.5			
Capacity Module:																				
Cnflict Vol:	211	xxxx	xxxxx			102	xxxx	xxxxx			871	621	176	xxxx		656	102			
Potent Cap.:	1360	xxxx	xxxxx			1532	xxxx	xxxxx			331	515	1128	xxxx		494	1229			
Adj Cap:	1.00	xxxx	xxxxx			1.00	xxxx	xxxxx			0.33	0.72	1.00	xxxx		0.72	1.00			
Move Cap.:	1360	xxxx	xxxxx			1532	xxxx	xxxxx			110	373	1128	xxxx		357	1229			
Level Of Service Module:																				
Stopped Del:	2.7	xxxx	xxxxx			3.0	xxxx	xxxxx			45.2	12.7	3.3	xxxxx		19.1	4.0			
LOS by Move:	A	*	*			A	*	*			*	*	*	*		*	*			
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx			xxxx	269	xxxxx	xxxx		xxxx	673			
Shrd StpDel:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx			xxxxx	17.9	xxxxx	xxxxx		xxxx	9.1			
Shared LOS:	*	*	*			*	*	*			*	C	*	*		*	B			
ApproachDel:	0.6					1.8					17.9					9.1				

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Level Of Service Computation Report
1994 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #39 Sunset/Willamina

Cycle (sec): 1 Critical Vol./Cap. (X): 0.645
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 9.8
Optimal Cycle: 0 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1!	0	0	0 0 1!	0	0	0 0 1!	0	0	0 0 1!	0	0
Volume Module:												
Base Vol:	67	362	12	28	285	131	69	4	31	17	16	24
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	67	362	12	28	285	131	69	4	31	17	16	24
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	70	380	13	29	299	138	72	4	33	18	17	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	70	380	13	29	299	138	72	4	33	18	17	25
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	70	380	13	29	299	138	72	4	33	18	17	25
Saturation Flow Module:												
Sat/Lane:	801	801	801	722	722	722	249	249	249	101	101	101
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.15	0.82	0.03	0.06	0.64	0.30	0.66	0.04	0.30	0.30	0.28	0.42
Final Sat.:	121	657	22	45	463	214	164	9	75	30	29	42
Capacity Analysis Module:												
Vol/Sat:	0.58	0.58	0.58	0.65	0.65	0.65	0.44	0.44	0.44	0.59	0.59	0.59
Crit Moves:	****				****			****			****	
ApproachV/S:		0.58			0.65			0.44			0.59	
Level Of Service Module:												
Delay/Veh:	9.0	9.0	9.0	11.6	11.6	11.6	5.3	5.3	5.3	9.6	9.6	9.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	9.0	9.0	9.0	11.6	11.6	11.6	5.3	5.3	5.3	9.6	9.6	9.6
LOS by Move:	B	B	B	C	C	C	B	B	B	B	B	B
ApproachDel:		9.0			11.6			5.3			9.6	
LOS by Appr:		B			C			B			B	

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Forest Grove TSP Update
Future Decoupling Conditions with Left Turns
PM Peak Hour

Lane Geometry Report

Number of approach lanes: (L) (LT) (T) (RT) (R) (LTR)

Node	Intersection	NB	SB	EB	WB
1	E St/Pacific Ave	101000	000100	100010	000000
2	B St/Pacific Av	000001	000100	100100	100100
3	B Ave/19th Street	010010	100100	000001	000001
5	Council St/19th Ave	000000	000000	101000	000100
6	Elm St/19th Ave	010010	010000	100100	000001
8	Maple St/Pacific Av	100010	000000	001100	102000
9	Maple St/Hwy 47	000001	000001	100100	100100
10	Hwy 47-Quince/Pacific Ave	101010	101010	102010	102010
13	Elm St/Pacific Av	000001	000100	000100	100100
14	College-Council/Pacific Av	100100	000001	101000	000100
15	Main St/Pacific Av	000001	000001	000001	100100
20	B St/Willamina	000001	000001	000001	000001
25	Main St/23rd Av	010000	000100	000001	000000
28	Highway 47/Elm St	100100	100100	100100	100100
29	Gales Crk Rd/Willamina	000100	101000	000000	000001
31	Thatcher Rd/Gales Crk Rd	000000	000001	101000	000100
32	Gales Creek Rd/Forest Gale Dr	100100	100100	100100	100100
33	Thatcher Rd/Watercrest Rd	010000	000001	000001	000100
39	Sunset/Willamina	000001	000001	000001	000001

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 E St/Pacific Ave	C	1.2	0.000	C	1.2	0.000	+ 0.000 V/C
# 2 B St/Pacific Av	B	12.1	0.737	B	12.1	0.737	+ 0.000 D/V
# 3 B Ave/19th Street	A	2.6	0.328	A	2.6	0.328	+ 0.000 V/C
# 5 Council St/19th Ave	A	0.2	0.000	A	0.2	0.000	+ 0.000 V/C
# 6 Elm St/19th Ave	B	5.3	0.506	B	5.3	0.506	+ 0.000 D/V
# 8 Maple St/Pacific Av	B	11.4	0.822	B	11.4	0.822	+ 0.000 D/V
# 9 Maple St/Hwy 47	C	17.2	0.704	C	17.2	0.704	+ 0.000 D/V
# 10 Hwy 47-Quince/Pacific Ave	D	34.0	0.999	D	34.0	0.999	+ 0.000 D/V
# 13 Elm St/Pacific Av	B	5.1	0.442	B	5.1	0.442	+ 0.000 D/V
# 14 College-Council/Pacific Av	A	4.4	0.577	A	4.4	0.577	+ 0.000 D/V
# 15 Main St/Pacific Av	B	11.4	0.743	B	11.4	0.743	+ 0.000 D/V
# 20 B St/Willamina	A	2.2	0.300	A	2.2	0.300	+ 0.000 V/C
# 25 Main St/23rd Av	A	1.5	0.000	A	1.5	0.000	+ 0.000 V/C
# 29 Gales Crk Rd/Willamina	B	0.3	0.000	B	0.3	0.000	+ 0.000 V/C
# 31 Thatcher Rd/Gales Crk Rd	B	2.1	0.000	B	2.1	0.000	+ 0.000 V/C
# 33 Thatcher Rd/Watercrest Rd	B	2.8	0.000	B	2.8	0.000	+ 0.000 V/C
# 39 Sunset/Willamina	C	2.2	0.000	C	2.2	0.000	+ 0.000 V/C

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #1 E St/Pacific Ave

Average Delay (sec/veh): 1.2 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	1 0 1	0	0	0 0 0	1	0	0 1 0	1	0	0 0 0	1	0
Volume Module:												
Base Vol:	64	391	0	0	286	2	10	0	150	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	64	391	0	0	286	2	10	0	150	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	69	422	0	0	309	2	11	0	162	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	69	422	0	0	309	2	11	0	162	0	0	0
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	76	422	0	0	309	2	12	0	178	0	0	0
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	xxxxx	xxxx	xxxxx
Critical Gp:	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	311	xxxx	xxxxx	xxxx	xxxx	xxxxx	801	xxxx	310	xxxx	xxxx	xxxxx
Potent Cap.:	1219	xxxx	xxxxx	xxxx	xxxx	xxxxx	364	xxxx	964	xxxx	xxxx	xxxxx
Adj Cap:	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.94	xxxx	1.00	xxxx	xxxx	xxxxx
Move Cap.:	1219	xxxx	xxxxx	xxxx	xxxx	xxxxx	341	xxxx	964	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	3.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	10.9	xxxx	4.5	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	341	xxxx	964	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	10.9	xxxx	4.5	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	C	*	A	*	*	*
ApproachDel:	0.5			0.0			4.9			0.0		

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #2 B St/Pacific Av

Cycle (sec): 50 Critical Vol./Cap. (X): 0.737
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 12.1
Optimal Cycle: 52 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1	0	0 0	0 0	0 1	0	1 0	0	0 1	1 0	0	1 0
Volume Module:												
Base Vol:	86	41	0	0	125	6	15	0	368	217	543	44
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	86	41	0	0	125	6	15	0	368	217	543	44
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	96	46	0	0	139	7	17	0	410	242	605	49
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	96	46	0	0	139	7	17	0	410	242	605	49
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	96	46	0	0	139	7	17	0	410	242	605	49
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.67	0.67	1.00	1.00	0.78	0.78	0.83	1.00	0.73	0.83	0.85	0.85
Lanes:	0.68	0.32	0.00	0.00	0.95	0.05	1.00	0.00	1.00	1.00	0.93	0.07
Final Sat.:	859	412	0	0	1407	71	1577	0	1389	1577	1496	121
Capacity Analysis Module:												
Vol/Sat:	0.11	0.11	0.00	0.00	0.10	0.10	0.01	0.00	0.30	0.15	0.40	0.40
Crit Moves:		****							****	****		
Green/Cycle:	0.15	0.15	0.00	0.00	0.15	0.15	0.02	0.00	0.40	0.21	0.59	0.59
Volume/Cap:	0.74	0.74	0.00	0.00	0.65	0.65	0.68	0.00	0.74	0.74	0.68	0.68
Level Of Service Module:												
Delay/Veh:	22.3	22.3	0.0	0.0	17.4	17.4	49.4	0.0	11.8	17.7	5.9	5.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.3	22.3	0.0	0.0	17.4	17.4	49.4	0.0	11.8	17.7	5.9	5.9
AustraQueue:	2	1	0	0	2	0	1	0	6	4	6	1

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1994 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #3 B Ave/19th Street

Cycle (sec): 1 Critical Vol./Cap. (X): 0.328
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 2.6
Optimal Cycle: 0 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Ignore			Include			Include			Include		
Lanes:	0 1	0	0 1	1 0	0	1 0	0 0	1!	0 0	0 0	0	0 0
Volume Module:												
Base Vol:	6	103	195	477	293	3	1	14	7	0	0	0
Growth Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	103	0	477	293	3	1	14	7	0	0	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.77	0.77	0.00	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
PHF Volume:	8	134	0	623	383	4	1	18	9	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	134	0	623	383	4	1	18	9	0	0	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	8	134	0	623	383	4	1	18	9	0	0	0
Saturation Flow Module:												
Sat/Lane:	433	433	433	651	651	651	141	141	141	0	0	0
Adjustment:	1.00	1.00	1.00	3.00	3.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.06	0.94	1.00	1.00	0.99	0.01	0.04	0.64	0.32	0.00	0.00	0.00
Final Sat.:	24	409	433	1953	1933	20	5	91	45	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.33	0.33	0.00	0.32	0.20	0.20	0.20	0.20	0.20	0.00	0.00	0.00
Crit Moves:		****		****			****					****
ApproachV/S:		0.16			0.26			0.20			xxxxx	
Level Of Service Module:												
Delay/Veh:	3.5	3.5	0.0	3.4	2.1	2.1	2.1	2.1	2.1	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	3.5	3.5	0.0	3.4	2.1	2.1	2.1	2.1	2.1	0.0	0.0	0.0
LOS by Move:	A	A	*	A	A	A	A	A	A	*	*	*
ApproachDel:		1.9			2.7			2.1			xxxxxx	
LOS by Appr:		A			A			A			F	

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #5 Council St/19th Ave

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: A

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Stop Sign						Stop Sign						Uncontrolled						Uncontrolled					
Rights:	Include						Include						Include						Include					
Lanes:	0	0	0	0	0		1	0	0	0	0		0	1	1	0	0		0	0	0	0	0	
Volume Module:																								
Base Vol:	0	0	0	0	0	0	88	894	0	0	0	0												
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00												
Initial Bse:	0	0	0	0	0	0	88	894	0	0	0	0												
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00												
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93												
PHF Volume:	0	0	0	0	0	0	94	958	0	0	0	0												
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0												
Final Vol.:	0	0	0	0	0	0	94	958	0	0	0	0												
Adjusted Volume Module:																								
Grade:	0%						0%						0%						0%					
% Cycle/Cars:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
% Truck/Comb:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00												
Cycl/Car PCE:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
Trck/Cmb PCE:	xxxx	xxxx					xxxx	xxxx					xxxx	xxxx					xxxx	xxxx				
Adj Vol.:	0	0	0	0	0	0	104	958	0	0	0	0												
Critical Gap Module:																								
MoveUp Time:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
Capacity Module:																								
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0	xxxx	xxxxx	xxxx	xxxx	xxxxx												
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1714	xxxx	xxxxx	xxxx	xxxx	xxxxx												
Adj Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx												
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1714	xxxx	xxxxx	xxxx	xxxx	xxxxx												
Level Of Service Module:																								
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*												
Movement:	LT - LTR - RT						LT - LTR - RT						LT - LTR - RT						LT - LTR - RT					
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx												
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx												
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*												
ApproachDel:	0.0			0.0			0.2			0.0														

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #6 Elm St/19th Ave

Cycle (sec): 55 Critical Vol./Cap. (X): 0.506
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 5.3
Optimal Cycle: 30 Level Of Service: B

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Permitted						Permitted						Permitted						Permitted					
Rights:	Include						Include						Include						Include					
Min. Green:	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0	
Lanes:	0	0	1	0	1		0	1	0	0	0		0	1	0	1	0		0	0	0	0	0	
Volume Module:																								
Base Vol:	0	99	63	23	70	0	6	1041	79	0	0	0												
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00												
Initial Bse:	0	99	63	23	70	0	6	1041	79	0	0	0												
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00												
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89												
PHF Volume:	0	112	71	26	79	0	7	1174	89	0	0	0												
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0												
Reduced Vol:	0	112	71	26	79	0	7	1174	89	0	0	0												
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00												
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.05	1.00	1.00	1.00												
Final Vol.:	0	112	71	26	79	0	7	1232	94	0	0	0												
Saturation Flow Module:																								
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900												
Adjustment:	1.00	0.99	0.84	0.85	0.85	1.00	0.95	0.95	0.95	1.00	1.00	1.00												
Lanes:	0.00	1.00	1.00	0.25	0.75	0.00	0.01	1.85	0.14	0.00	0.00	0.00												
Final Sat.:	0	1881	1599	402	1221	0	19	3348	255	0	0	0												
Capacity Analysis Module:																								
Vol/Sat:	0.00	0.06	0.04	0.06	0.06	0.00	0.37	0.37	0.37	0.00	0.00	0.00												
Crit Moves:					****				****															
Green/Cycle:	0.00	0.13	0.13	0.13	0.13	0.00	0.73	0.73	0.73	0.00	0.00	0.00												
Volume/Cap:	0.00	0.47	0.35	0.51	0.51	0.00	0.51	0.51	0.51	0.00	0.00	0.00												
Level Of Service Module:																								
Delay/Veh:	0.0	18.0	17.1	18.7	18.7	0.0	2.6	2.6	2.6	0.0	0.0	0.0												
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00												
AdjDel/Veh:	0.0	18.0	17.1	18.7	18.7	0.0	2.6	2.6	2.6	0.0	0.0	0.0												
AustraQueue:	0	2	1	0	1	0	0	8	1	0	0	0												

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #8 Maple St/Pacific Av

Cycle (sec): 60 Critical Vol./Cap. (X): 0.822
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 11.4
Optimal Cycle: 67 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	2	0	0
Volume Module:																					
Base Vol:	173	0	119	0	0	0	0	1133	54	333	1039	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	173	0	119	0	0	0	0	1133	54	333	1039	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	182	0	126	0	0	0	0	1195	57	351	1096	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	182	0	126	0	0	0	0	1195	57	351	1096	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.00	1.05	1.00
Final Vol.:	182	0	126	0	0	0	0	1255	60	351	1151	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.94	1.00	0.84	1.00	1.00	1.00	1.00	0.96	0.96	0.94	0.98	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.91	0.09	1.00	2.00	0.00
Final Sat.:	1787	0	1599	0	0	0	0	3492	167	1787	3732	0
Capacity Analysis Module:												
Vol/Sat:	0.10	0.00	0.08	0.00	0.00	0.00	0.00	0.36	0.36	0.20	0.31	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.12	0.00	0.12	0.00	0.00	0.00	0.00	0.44	0.44	0.24	0.68	0.00
Volume/Cap:	0.82	0.00	0.64	0.00	0.00	0.00	0.00	0.82	0.82	0.82	0.46	0.00
Level Of Service Module:												
Delay/Veh:	31.0	0.0	20.7	0.0	0.0	0.0	0.0	12.1	12.1	22.4	3.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	31.0	0.0	20.7	0.0	0.0	0.0	0.0	12.1	12.1	22.4	3.0	0.0
AustraQueue:	4	0	2	0	0	0	0	20	2	7	9	0

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1985 HCM Operations Method (Base Volume Alternative)

Intersection #9 Maple St/Hwy 47

Cycle (sec): 90 Critical Vol./Cap. (X): 0.704
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 17.2
Optimal Cycle: 58 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1!	0	0	0	0	0	1!	0	0	1	0	0	1	0	1	0	0	1	0
Volume Module:																					
Base Vol:	63	99	110	47	43	58	49	369	80	115	562	14
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	63	99	110	47	43	58	49	369	80	115	562	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
PHF Volume:	72	113	125	53	49	66	56	419	91	131	639	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	72	113	125	53	49	66	56	419	91	131	639	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	72	113	125	53	49	66	56	419	91	131	639	16
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.81	0.81	0.81	0.64	0.64	0.64	0.95	0.97	0.97	0.95	1.00	1.00
Lanes:	0.23	0.36	0.41	0.32	0.29	0.39	1.00	0.82	0.18	1.00	0.98	0.02
Final Sat.:	338	530	586	362	335	451	1710	1434	312	1710	1756	44
Capacity Analysis Module:												
Vol/Sat:	0.21	0.21	0.21	0.15	0.15	0.15	0.03	0.29	0.29	0.08	0.36	0.36
Crit Moves:		****					****				****	
Green/Cycle:	0.30	0.30	0.30	0.30	0.30	0.30	0.05	0.45	0.45	0.12	0.52	0.52
Volume/Cap:	0.70	0.70	0.70	0.48	0.48	0.48	0.70	0.65	0.65	0.65	0.70	0.70
Level Of Service Module:												
Delay/Veh:	24.6	24.6	24.6	20.3	20.3	20.3	47.8	16.2	16.2	34.0	14.2	14.2
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ProgAdjFctr:	0.85	0.85	0.85	0.85	0.85	0.85	1.00	0.85	0.85	1.00	0.85	0.85
AdjDel/Veh:	20.9	20.9	20.9	17.3	17.3	17.3	47.8	13.8	13.8	34.0	12.1	12.1
AustraQueue:	7	7	7	4	4	4	2	10	10	3	13	13

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Forest Grove TSP Update
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #10 Hwy 47-Quince/Pacific Ave

Cycle (sec):	120	Critical Vol./Cap. (X):	0.999	
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	34.0	
Optimal Cycle:	180	Level Of Service:	D	

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	1	0 1	2 0	1	0 1	1 0	2	0 1	2 0	2	0 1
Volume Module:												
Base Vol:	39	242	322	368	242	109	36	1006	58	455	1128	485
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	39	242	322	368	242	109	36	1006	58	455	1128	485
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	40	251	334	382	251	113	37	1045	60	472	1171	504
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	40	251	334	382	251	113	37	1045	60	472	1171	504
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.03	1.00	1.00	1.00	1.05	1.00	1.03	1.05	1.00
Final Vol.:	40	251	334	394	251	113	37	1097	60	487	1230	504
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.39	0.95	0.81	0.22	0.96	0.82	0.93	0.98	0.83	0.94	0.99	0.84
Lanes:	1.00	1.00	1.00	2.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	742	1810	1538	840	1827	1553	1770	3725	1583	3574	3762	1599
Capacity Analysis Module:												
Vol/Sat:	0.05	0.14	0.22	0.47	0.14	0.07	0.02	0.29	0.04	0.14	0.33	0.32
Crit Moves:				****				****		****		
Green/Cycle:	0.47	0.47	0.47	0.47	0.47	0.47	0.03	0.29	0.29	0.14	0.41	0.41
Volume/Cap:	0.11	0.30	0.46	1.00	0.29	0.16	0.81	1.00	0.13	1.00	0.81	0.78
Level Of Service Module:												
Delay/Veh:	11.6	12.7	14.3	55.3	12.7	11.8	79.5	48.1	20.1	64.7	22.7	24.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.6	12.7	14.3	55.3	12.7	11.8	79.5	48.1	20.1	64.7	22.7	24.2
AustraQueue:	1	5	8	18	5	2	2	45	1	22	38	16

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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #13 Elm St/Pacific Av

Cycle (sec):	55	Critical Vol./Cap. (X):	0.442	
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	5.1	
Optimal Cycle:	28	Level Of Service:	B	

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1	0	0 0	0 0	0	0 1	0 0	0	0 0	0 1	0	1 0
Volume Module:												
Base Vol:	109	28	0	0	15	1	0	0	0	83	839	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	109	28	0	0	15	1	0	0	0	83	839	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	119	31	0	0	16	1	0	0	0	91	917	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	119	31	0	0	16	1	0	0	0	91	917	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.05
Final Vol.:	119	31	0	0	16	1	0	0	0	95	963	3
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	1.00	1.00	0.86	0.86	1.00	1.00	1.00	0.96	0.96	0.96
Lanes:	0.79	0.21	0.00	0.00	0.94	0.06	0.00	0.00	0.00	0.18	1.81	0.01
Final Sat.:	1358	354	0	0	1545	97	0	0	0	328	3322	10
Capacity Analysis Module:												
Vol/Sat:	0.09	0.09	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.29	0.29	0.29
Crit Moves:		****									****	
Green/Cycle:	0.20	0.20	0.00	0.00	0.20	0.20	0.00	0.00	0.00	0.66	0.66	0.66
Volume/Cap:	0.44	0.44	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.44	0.44	0.44
Level Of Service Module:												
Delay/Veh:	15.3	15.3	0.0	0.0	13.6	13.6	0.0	0.0	0.0	3.6	3.6	3.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	15.3	15.3	0.0	0.0	13.6	13.6	0.0	0.0	0.0	3.6	3.6	3.6
AustraQueue:	2	0	0	0	0	0	0	0	0	1	7	0

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Forest Grove TSP Update
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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #14 College-Council/Pacific Av

Cycle (sec): 55 Critical Vol./Cap. (X): 0.577
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 4.4
Optimal Cycle: 34 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1	0	0	0	0	0	1	0	0	0
Volume Module:												
Base Vol:	20	79	0	0	0	6	0	0	0	0	862	89
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	20	79	0	0	0	6	0	0	0	0	862	89
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
PHF Volume:	25	100	0	0	0	8	0	0	0	0	1090	113
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	25	100	0	0	0	8	0	0	0	0	1090	113
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.05
Final Vol.:	25	100	0	0	0	8	0	0	0	0	1144	118
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.74	0.78	1.00	1.00	1.00	0.65	1.00	1.00	1.00	1.00	0.78	0.78
Lanes:	1.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.81	0.19
Final Sat.:	1413	1487	0	0	0	1233	0	0	0	0	2686	277
Capacity Analysis Module:												
Vol/Sat:	0.02	0.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.43	0.43
Crit Moves:		****									****	
Green/Cycle:	0.12	0.12	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.74	0.74
Volume/Cap:	0.15	0.58	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.58	0.58
Level Of Service Module:												
Delay/Veh:	16.6	20.9	0.0	0.0	0.0	16.4	0.0	0.0	0.0	0.0	2.8	2.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	16.6	20.9	0.0	0.0	0.0	16.4	0.0	0.0	0.0	0.0	2.8	2.8
AustraQueue:	0	2	0	0	0	0	0	0	0	0	8	1

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #15 Main St/Pacific Av

Cycle (sec): 55 Critical Vol./Cap. (X): 0.743
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 11.4
Optimal Cycle: 47 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	0	0	0	0	1	0	0	0
Volume Module:												
Base Vol:	53	58	0	0	201	77	0	0	0	99	691	95
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	53	58	0	0	201	77	0	0	0	99	691	95
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	60	66	0	0	227	87	0	0	0	112	781	107
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	60	66	0	0	227	87	0	0	0	112	781	107
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.05
Final Vol.:	60	66	0	0	227	87	0	0	0	117	820	113
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.47	0.47	1.00	1.00	0.61	0.61	1.00	1.00	1.00	0.76	0.76	0.76
Lanes:	0.48	0.52	0.00	0.00	0.72	0.28	0.00	0.00	0.00	0.22	1.56	0.22
Final Sat.:	426	469	0	0	842	323	0	0	0	320	2245	309
Capacity Analysis Module:												
Vol/Sat:	0.14	0.14	0.00	0.00	0.27	0.27	0.00	0.00	0.00	0.37	0.37	0.37
Crit Moves:					****						****	
Green/Cycle:	0.36	0.36	0.00	0.00	0.36	0.36	0.00	0.00	0.00	0.49	0.49	0.49
Volume/Cap:	0.39	0.39	0.00	0.00	0.74	0.74	0.00	0.00	0.00	0.74	0.74	0.74
Level Of Service Module:												
Delay/Veh:	10.3	10.3	0.0	0.0	16.4	16.4	0.0	0.0	0.0	10.0	10.0	10.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.3	10.3	0.0	0.0	16.4	16.4	0.0	0.0	0.0	10.0	10.0	10.0
AustraQueue:	1	1	0	0	4	2	0	0	0	2	11	2

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1994 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #20 B St/Willamina

Cycle (sec): 1 Critical Vol./Cap. (X): 0.300
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 2.2
Optimal Cycle: 0 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:		Include			Include			Include			Include	
Lanes:	0	0 1!	0 0	0	0 1!	0 0	0	0 1!	0 0	0	0 1!	0 0
Volume Module:												
Base Vol:	10	59	11	64	39	10	7	30	5	9	25	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	59	11	64	39	10	7	30	5	9	25	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	11	66	12	72	44	11	8	34	6	10	28	77
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	66	12	72	44	11	8	34	6	10	28	77
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	11	66	12	72	44	11	8	34	6	10	28	77
Saturation Flow Module:												
Sat/Lane:	538	538	538	710	710	710	463	463	463	383	383	383
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.12	0.75	0.13	0.57	0.34	0.09	0.17	0.71	0.12	0.09	0.24	0.67
Final Sat.:	66	399	73	403	246	61	77	328	58	33	93	256
Capacity Analysis Module:												
Vol/Sat:	0.17	0.17	0.17	0.18	0.18	0.18	0.10	0.10	0.10	0.30	0.30	0.30
Crit Moves:			****	****					****		****	
ApproachV/S:		0.17			0.18			0.10			0.30	
Level Of Service Module:												
Delay/Veh:	1.9	1.9	1.9	2.0	2.0	2.0	1.5	1.5	1.5	3.1	3.1	3.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.9	1.9	1.9	2.0	2.0	2.0	1.5	1.5	1.5	3.1	3.1	3.1
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:		1.9			2.0			1.5			3.1	
LOS by Appr:		A			A			A			A	

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Forest Grove TSP Update
2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #25 Main St/23rd Av

Average Delay (sec/veh): 1.5 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:		Include			Include			Include			Include	
Lanes:	0	1 0	0 0	0	0 0	1 0	0	0 1!	0 0	0	0 0	0 0
Volume Module:												
Base Vol:	117	138	0	0	179	20	20	0	79	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	117	138	0	0	179	20	20	0	79	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	123	145	0	0	189	21	21	0	83	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	123	145	0	0	189	21	21	0	83	0	0	0
Adjusted Volume Module:												
Grade:		0%			0%			0%			0%	
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	136	145	0	0	189	21	23	0	92	0	0	0
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	xxxxx	xxxx	xxxxx
Critical Gp:	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	210	xxxx	xxxxx	xxxx	xxxx	xxxxx	468	xxxx	199	xxxx	xxxx	xxxxx
Potent Cap.:	1362	xxxx	xxxxx	xxxx	xxxx	xxxxx	567	xxxx	1098	xxxx	xxxx	xxxxx
Adj Cap:	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.89	xxxx	1.00	xxxx	xxxx	xxxxx
Move Cap.:	1362	xxxx	xxxxx	xxxx	xxxx	xxxxx	506	xxxx	1098	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	2.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.4	xxxx	3.5	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	888	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.3	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:		1.4			0.0			4.3			0.0	

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2020 Intersection Conditions
PM Peak Hour Alternative A Mitigated

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

****

Intersection #29 Gales Crk Rd/Willamina

****

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: B

****

Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1!	0	0
Volume Module:																				
Base Vol:	0	246		40		31	112		0		0	0		0		2	0		1	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	0	246		40		31	112		0		0	0		0		2	0		1	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	0.93	0.93		0.93		0.93	0.93		0.93		0.93	0.93		0.93		0.93	0.93		0.93	
PHF Volume:	0	266		43		34	121		0		0	0		0		2	0		1	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Final Vol.:	0	266		43		34	121		0		0	0		0		2	0		1	
Adjusted Volume Module:																				
Grade:	0%					0%					0%					0%				
% Cycle/Cars:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
% Truck/Comb:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
PCE Adj:	1.10	1.00		1.00		1.10	1.00		1.00		1.10	1.10		1.10		1.10	1.10		1.10	
Cycl/Car PCE:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
Trck/Cmb PCE:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
Adj Vol.:	0	266		43		37	121		0		0	0		0		2	0		1	
Critical Gap Module:																				
MoveUp Time:	xxxxx	xxxx	xxxxx			2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx		3.4	xxxx		2.6				
Critical Gp:	xxxxx	xxxx	xxxxx			5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx		6.5	xxxx		5.5				
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	xxxxx			309	xxxx	xxxxx		xxxx	xxxx	xxxxx		442	xxxx		288			
Potent Cap.:	xxxx	xxxx	xxxxx			1221	xxxx	xxxxx		xxxx	xxxx	xxxxx		587	xxxx		990			
Adj Cap:	xxxx	xxxx	xxxxx			1.00	xxxx	xxxxx		xxxx	xxxx	xxxxx		0.97	xxxx		1.00			
Move Cap.:	xxxx	xxxx	xxxxx			1221	xxxx	xxxxx		xxxx	xxxx	xxxxx		569	xxxx		990			
Level Of Service Module:																				
Stopped Del:	xxxxx	xxxx	xxxxx			3.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx		6.3	xxxx		3.6				
LOS by Move:	*	*	*			A	*	*	*	*	*		*	*		*				
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx	xxxxx			xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx		663	xxxxx			
Shrd StpDel:	xxxxx	xxxx	xxxxx			xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx		5.4	xxxxx			
Shared LOS:	*	*	*			*	*	*		*	*	*		*		B	*			
ApproachDel:	0.0					0.7					0.0					5.4				

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

****

Intersection #31 Thatcher Rd/Gales Crk Rd

****

Average Delay (sec/veh): 2.1 Worst Case Level Of Service: B

****

Approach:	North Bound					South Bound					East Bound					West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Stop Sign					Stop Sign					Uncontrolled					Uncontrolled				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	0	0	0	0	0	1!	0	0	1	0	1	0	0	0	0	0	1	0
Volume Module:																				
Base Vol:	0	0		0		105	0		52		25	102		0		0	243		43	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	0	0		0		105	0		52		25	102		0		0	243		43	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	0.86	0.86		0.86		0.86	0.86		0.86		0.86	0.86		0.86		0.86	0.86		0.86	
PHF Volume:	0	0		0		122	0		60		29	119		0		0	283		50	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Final Vol.:	0	0		0		122	0		60		29	119		0		0	283		50	
Adjusted Volume Module:																				
Grade:	0%					0%					0%					0%				
% Cycle/Cars:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
% Truck/Comb:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
PCE Adj:	1.10	1.10		1.10		1.10	1.10		1.10		1.10	1.00		1.00		1.10	1.00		1.00	
Cycl/Car PCE:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
Trck/Cmb PCE:	xxxx	xxxx				xxxx	xxxx				xxxx	xxxx				xxxx	xxxx			
Adj Vol.:	0	0		0		134	0		67		32	119		0		0	283		50	
Critical Gap Module:																				
MoveUp Time:	xxxxx	xxxx	xxxxx			3.4	xxxx		2.6		2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Critical Gp:	xxxxx	xxxx	xxxxx			6.5	xxxx		5.5		5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	xxxxx			455	xxxx		308		333	xxxx	xxxxx		xxxx	xxxx	xxxxx			
Potent Cap.:	xxxx	xxxx	xxxxx			577	xxxx		967		1190	xxxx	xxxxx		xxxx	xxxx	xxxxx			
Adj Cap:	xxxx	xxxx	xxxxx			0.97	xxxx		1.00		1.00	xxxx	xxxxx		xxxx	xxxx	xxxxx			
Move Cap.:	xxxx	xxxx	xxxxx			562	xxxx		967		1190	xxxx	xxxxx		xxxx	xxxx	xxxxx			
Level Of Service Module:																				
Stopped Del:	xxxxx	xxxx	xxxxx			8.2	xxxx		4.0		3.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
LOS by Move:	*	*	*			*	*		*		A	*	*	*	*	*				
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx	xxxxx			xxxx	652	xxxxx		xxxx	xxxx	xxxxx		xxxx	xxxx	xxxxx				
Shrd StpDel:	xxxxx	xxxx	xxxxx			xxxxx	6.8	xxxxx		xxxxx	xxxx	xxxxx		xxxxx	xxxx	xxxxx				
Shared LOS:	*	*	*			*	B	*		*	*	*		*	*	*				
ApproachDel:	0.0					6.8					0.7					0.0				

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

****

Intersection #33 Thatcher Rd/Watercrest Rd

****

Average Delay (sec/veh): 2.8 Worst Case Level Of Service: B

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 1	0	0	0 0	1! 0	0	0 0	1! 0	0	0 0	0 1	0
Volume Module:												
Base Vol:	25	37	0	86	116	211	120	3	24	0	3	112
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	25	37	0	86	116	211	120	3	24	0	3	112
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	27	39	0	92	124	225	128	3	26	0	3	120
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	27	39	0	92	124	225	128	3	26	0	3	120
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	29	39	0	101	124	225	141	4	28	0	4	131
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx	3.4	3.3	2.6	xxxxx	3.3	2.6
Critical Gp:	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx	6.5	6.0	5.5	xxxxx	6.0	5.5
Capacity Module:												
Cnflict Vol:	349	xxxx	xxxxx	39	xxxx	xxxxx	456	394	236	xxxx	507	39
Potent Cap.:	1169	xxxx	xxxxx	1642	xxxx	xxxxx	577	677	1051	xxxx	591	1322
Adj Cap:	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx	0.83	0.90	1.00	xxxx	0.90	1.00
Move Cap.:	1169	xxxx	xxxxx	1642	xxxx	xxxxx	477	609	1051	xxxx	531	1322
Level Of Service Module:												
Stopped Del:	3.2	xxxx	xxxxx	2.3	xxxx	xxxxx	10.3	5.9	3.5	xxxxx	6.8	3.0
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	526	xxxxx	xxxx	xxxx	1273
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	9.1	xxxxx	xxxxx	xxxx	3.1
Shared LOS:	*	*	*	*	*	*	*	B	*	*	*	A
ApproachDel:		1.3			0.5			9.1			3.1	

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

****

Intersection #39 Sunset/Willamina

****

Average Delay (sec/veh): 2.2 Worst Case Level Of Service: C

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1! 0	0	0 0	1! 0	0	0 0	1! 0	0	0 0	1! 0	0
Volume Module:												
Base Vol:	62	355	13	10	275	131	71	5	31	28	9	12
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	62	355	13	10	275	131	71	5	31	28	9	12
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	65	373	14	11	289	138	75	5	33	29	9	13
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	65	373	14	11	289	138	75	5	33	29	9	13
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	72	373	14	12	289	138	82	6	36	32	10	14
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx	3.4	3.3	2.6	3.4	3.3	2.6
Critical Gp:	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx	6.5	6.0	5.5	6.5	6.0	5.5
Capacity Module:												
Cnflict Vol:	426	xxxx	xxxxx	387	xxxx	xxxxx	824	820	358	832	882	380
Potent Cap.:	1074	xxxx	xxxxx	1122	xxxx	xxxxx	353	405	912	349	376	889
Adj Cap:	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx	0.89	0.90	1.00	0.88	0.90	1.00
Move Cap.:	1074	xxxx	xxxxx	1122	xxxx	xxxxx	314	365	912	306	339	889
Level Of Service Module:												
Stopped Del:	3.6	xxxx	xxxxx	3.2	xxxx	xxxxx	15.0	10.0	4.1	13.0	10.9	4.1
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	390	xxxxx	xxxx	373	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	11.6	xxxxx	xxxxx	10.4	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	C	*
ApproachDel:		0.6			0.1			11.6			10.4	

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Forest Grove TSP Update
2020 Intersection Conditions
Alt. A Mitigated PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Future Volume Alternative)

****

Intersection #32 Gales Creek Rd/Forest Gale Dr

****

Average Delay (sec/veh): 1.9 Worst Case Level Of Service: B

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	1 0 0 1 0			1 0 0 1 0			1 0 0 1 0			1 0 0 1 0		
Volume Module:												
Base Vol:	10	0	15	100	10	10	10	100	2	30	150	175
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	0	15	100	10	10	10	100	2	30	150	175
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	0	15	100	10	10	10	100	2	30	150	175
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	11	0	17	110	11	11	11	110	2	33	165	193
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	11	0	17	110	11	11	11	110	2	33	165	193
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		0.00	0.86		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		0.12	0.02		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	xxxx	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		0.50	1.00		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		1.50	2.00		xxxx	xxxx	
Adj Vol.:	12	0	18	121	12	12	12	110	2	36	165	193
Critical Gap Module:												
MoveUp Time:	3.4	xxxx	2.6	3.4	3.3	2.6	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx
Critical Gp:	6.5	xxxx	5.5	6.5	6.0	5.5	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	428	xxxx	111	425	418	262	358	xxxx	xxxxx	112	xxxx	xxxxx
Potent Cap.:	599	xxxx	1216	601	658	1020	1158	xxxx	xxxxx	1515	xxxx	xxxxx
Adj Cap:	0.95	xxxx	1.00	0.96	0.97	1.00	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx
Move Cap.:	568	xxxx	1216	576	636	1020	1158	xxxx	xxxxx	1515	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	6.5	xxxx	3.0	7.7	5.8	3.6	3.1	xxxx	xxxxx	2.4	xxxx	xxxxx
LOS by Move:	B	*	*	B	*	*	A	*	*	A	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	1216	xxxx	xxxx	784	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	3.0	xxxxx	xxxx	4.7	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	A	*	*	A	*	*	*	*	*	*
ApproachDel:	4.4			7.2			0.3			0.2		

Forest Grove TSP Update
2020 Intersection Conditions
Alt. A Mitigated PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #28 Highway 47/Elm St

Average Delay (sec/veh): 4.9 Worst Case Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	1 0	0 1	0	1 0	0 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	6	47	18	30	18	70	56	450	19	19	650	48
Growth Adj:	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.00	1.00	1.00	1.00	1.50
Initial Bse:	6	47	18	45	27	105	84	450	19	19	650	72
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	7	52	20	50	30	116	93	497	21	21	717	79
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	7	52	20	50	30	116	93	497	21	21	717	79
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	7	57	22	55	33	127	102	497	21	23	717	79
Critical Gap Module:												
MoveUp Time:	3.4	3.3	2.6	3.4	3.3	2.6	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx
Critical Gp:	6.5	6.0	5.5	6.5	6.0	5.5	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1451	1418	507	1414	1389	757	797	xxxx	xxxxx	518	xxxx	xxxxx
Potent Cap.:	153	197	766	161	204	572	715	xxxx	xxxxx	971	xxxx	xxxxx
Adj Cap:	0.58	0.84	1.00	0.63	0.84	1.00	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx
Move Cap.:	89	165	766	101	171	572	715	xxxx	xxxxx	971	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	43.7	31.8	4.8	69.3	25.6	7.9	5.8	xxxx	xxxxx	3.8	xxxx	xxxxx
LOS by Move:	E	*	*	F	*	*	B	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	210	xxxx	xxxx	386	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	24.4	xxxxx	xxxx	11.5	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	D	*	*	C	*	*	*	*	*	*
ApproachDel:		26.0			26.2			1.0			0.1	

Forest Grove TSP Update
2020 Intersection Conditions
Alt. A Mitigated PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #28 Highway 47/Elm St

Cycle (sec):	90	Critical Vol./Cap. (X):	0.648
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	10.7
Optimal Cycle:	52	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	0	1 0	1 0	0	1 0	1 0	0	1 0	1 0	0	1 0
Volume Module:												
Base Vol:	6	47	18	30	18	70	56	450	19	19	650	48
Growth Adj:	1.00	1.00	1.00	1.50	1.50	1.50	1.50	1.00	1.00	1.00	1.00	1.50
Initial Bse:	6	47	18	45	27	105	84	450	19	19	650	72
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	7	52	20	50	30	116	93	497	21	21	717	79
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	7	52	20	50	30	116	93	497	21	21	717	79
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	7	52	20	50	30	116	93	497	21	21	717	79
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.48	0.96	0.96	0.76	0.88	0.88	0.95	0.99	0.99	0.95	0.99	0.99
Lanes:	1.00	0.72	0.28	1.00	0.21	0.79	1.00	0.96	0.04	1.00	0.90	0.10
Final Sat.:	912	1317	507	1444	344	1328	1805	1805	76	1805	1694	187
Capacity Analysis Module:												
Vol/Sat:	0.01	0.04	0.04	0.03	0.09	0.09	0.05	0.28	0.28	0.01	0.42	0.42
Crit Moves:					****		****				****	
Green/Cycle:	0.13	0.13	0.13	0.13	0.13	0.13	0.08	0.70	0.70	0.03	0.65	0.65
Volume/Cap:	0.06	0.29	0.29	0.26	0.65	0.65	0.65	0.39	0.39	0.39	0.65	0.65
Level Of Service Module:												
Delay/Veh:	21.9	22.9	22.9	22.7	28.2	28.2	32.6	3.7	3.7	30.1	6.9	6.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	21.9	22.9	22.9	22.7	28.2	28.2	32.6	3.7	3.7	30.1	6.9	6.9
AustraQueue:	0	1	0	1	1	3	3	5	0	1	11	2

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Forest Grove TSP Update
2020 Intersection Conditions (Mitigated)
PM Peak Hour

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 E St/Pacific Ave	C	1.1	0.000	C	1.1	0.000	+ 0.000 V/C
# 2 B St/Pacific Av	B	11.5	0.717	B	11.5	0.717	+ 0.000 D/V
# 3 B Ave/19th Street	A	2.4	0.311	A	2.4	0.311	+ 0.000 V/C
# 5 Council St/19th Ave	A	0.3	0.000	A	0.3	0.000	+ 0.000 V/C
# 6 Elm St/19th Ave	B	5.3	0.507	B	5.3	0.507	+ 0.000 D/V
# 8 Maple St/Pacific Av	B	7.8	0.699	B	7.8	0.699	+ 0.000 D/V
# 9 Maple St/Hwy 47	F	30.9	0.000	F	30.9	0.000	+ 0.000 V/C
# 10 Hwy 47-Quince/Pacific Ave	C	24.9	0.881	C	24.9	0.881	+ 0.000 D/V
# 13 Elm St/Pacific Av	A	4.8	0.441	A	4.8	0.441	+ 0.000 D/V
# 14 College-Council/Pacific Av	B	5.3	0.642	B	5.3	0.642	+ 0.000 D/V
# 15 Main St/Pacific Av	B	6.8	0.600	B	6.8	0.600	+ 0.000 D/V
# 20 B St/Willamina	A	2.2	0.292	A	2.2	0.292	+ 0.000 V/C
# 25 Main St/23rd Av	A	1.3	0.000	A	1.3	0.000	+ 0.000 V/C
# 29 Gales Crk Rd/Willamina	A	0.3	0.000	A	0.3	0.000	+ 0.000 V/C
# 31 Thatcher Rd/Gales Crk Rd	B	1.1	0.000	B	1.1	0.000	+ 0.000 V/C
# 33 Thatcher Rd/Watercrest Rd	D	7.5	0.000	D	7.5	0.000	+ 0.000 V/C
# 39 Sunset/Willamina	C	2.4	0.000	C	2.4	0.000	+ 0.000 V/C

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Forest Grove TSP Update
2020 Intersection Conditions (Mitigated)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #1 E St/Pacific Ave

Average Delay (sec/veh): 1.1 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	1 0	1 0	0	0 0	0 1	0	0 1	0 1	0	0 0	0 1	0
Volume Module:												
Base Vol:	64	430	0	0	277	2	10	0	150	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	64	430	0	0	277	2	10	0	150	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	69	464	0	0	299	2	11	0	162	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	69	464	0	0	299	2	11	0	162	0	0	0
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	76	464	0	0	299	2	12	0	178	0	0	0
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	xxxxx	xxxx	xxxxx
Critical Gp:	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	301	xxxx	xxxxx	xxxx	xxxx	xxxxx	834	xxxx	300	xxxx	xxxx	xxxxx
Potent Cap.:	1232	xxxx	xxxxx	xxxx	xxxx	xxxxx	348	xxxx	975	xxxx	xxxx	xxxxx
Adj Cap:	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.94	xxxx	1.00	xxxx	xxxx	xxxxx
Move Cap.:	1232	xxxx	xxxxx	xxxx	xxxx	xxxxx	327	xxxx	975	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	3.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	11.4	xxxx	4.4	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	327	xxxx	975	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	11.4	xxxx	4.4	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	C	*	A	*	*	*
ApproachDel:	0.4			0.0			4.9			0.0		

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Forest Grove TSP Update
2020 Intersection Conditions (Mitigated)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #5 Council St/19th Ave

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	0	0 0	1 0	0	0 0	0 1	1	0 0	0 0	0	0 0
Volume Module:												
Base Vol:	0	0	0	0	0	0	88	696	0	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	88	696	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	0	0	0	0	0	94	746	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	0	0	0	94	746	0	0	0	0
Adjusted Volume Module:												
Grade:		0%			0%			0%			0%	
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.00	1.00
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	0	0	0	0	0	0	104	746	0	0	0	0
Critical Gap Module:												
MoveUp Time:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1714	xxxx	xxxxx	xxxx	xxxx	xxxxx
Adj Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1714	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		0.0			0.0			0.3			0.0	

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Forest Grove TSP Update
2020 Intersection Conditions (Mitigated)
PM Peak Hour

Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #6 Elm St/19th Ave

Cycle (sec): 55 Critical Vol./Cap. (X): 0.507
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 5.3
Optimal Cycle: 30 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	1	0 1	0 1	0	0 0	0 1	0	1 0	0 0	0	0 0
Volume Module:												
Base Vol:	0	86	71	24	69	0	6	1076	47	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	86	71	24	69	0	6	1076	47	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	0	97	80	27	78	0	7	1213	53	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	97	80	27	78	0	7	1213	53	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.05	1.00	1.00	1.00
Final Vol.:	0	97	80	27	78	0	7	1274	56	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.99	0.84	0.86	0.86	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Lanes:	0.00	1.00	1.00	0.26	0.74	0.00	0.01	1.91	0.08	0.00	0.00	0.00
Final Sat.:	0	1881	1599	422	1220	0	19	3451	152	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.05	0.05	0.06	0.06	0.00	0.37	0.37	0.37	0.00	0.00	0.00
Crit Moves:					****			****				
Green/Cycle:	0.00	0.13	0.13	0.13	0.13	0.00	0.73	0.73	0.73	0.00	0.00	0.00
Volume/Cap:	0.00	0.41	0.40	0.51	0.51	0.00	0.51	0.51	0.51	0.00	0.00	0.00
Level Of Service Module:												
Delay/Veh:	0.0	17.5	17.5	18.7	18.7	0.0	2.6	2.6	2.6	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	17.5	17.5	18.7	18.7	0.0	2.6	2.6	2.6	0.0	0.0	0.0
AustraQueue:	0	1	1	1	1	0	0	9	0	0	0	0

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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #10 Hwy 47-Quince/Pacific Ave

Cycle (sec):	120	Critical Vol./Cap. (X):	0.881
Loss Time (sec):	16 (Y+R = 4 sec)	Average Delay (sec/veh):	24.9
Optimal Cycle:	120	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	0 1	2	0 1	0 1	1	0 2	0 1	2	0 2	0 1
Volume Module:												
Base Vol:	52	188	385	414	241	103	45	1104	82	685	1125	714
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	52	188	385	414	241	103	45	1104	82	685	1125	714
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	54	195	400	430	250	107	47	1146	85	711	1168	741
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	54	195	400	430	250	107	47	1146	85	711	1168	741
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.03	1.00	1.00	1.00	1.05	1.00	1.03	1.05	1.00
Final Vol.:	54	195	400	443	250	107	47	1204	85	733	1227	741
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.95	0.81	0.91	0.96	0.82	0.93	0.98	0.83	0.94	0.99	0.84
Lanes:	1.00	1.00	1.00	2.00	1.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	1719	1810	1538	3471	1827	1553	1770	3725	1583	3574	3762	1599
Capacity Analysis Module:												
Vol/Sat:	0.03	0.11	0.26	0.13	0.14	0.07	0.03	0.32	0.05	0.21	0.33	0.46
Crit Moves:		****		****				****		****		
Green/Cycle:	0.05	0.12	0.36	0.14	0.22	0.22	0.04	0.37	0.37	0.23	0.56	0.70
Volume/Cap:	0.63	0.88	0.73	0.88	0.63	0.32	0.60	0.88	0.15	0.88	0.59	0.66
Level Of Service Module:												
Delay/Veh:	45.3	55.0	25.3	44.1	29.8	25.7	44.9	28.0	16.4	36.4	11.7	7.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.3	55.0	25.3	44.1	29.8	25.7	44.9	28.0	16.4	36.4	11.7	7.5
AustraQueue:	2	8	12	17	8	3	2	40	2	26	27	14

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Level Of Service Computation Report
1994 HCM Operations Method (Base Volume Alternative)

Intersection #13 Elm St/Pacific Av

Cycle (sec):	55	Critical Vol./Cap. (X):	0.441
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	4.8
Optimal Cycle:	28	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1 0	0 0	0	0 0	1 0	0	0 0	0 0	0	1 0	1 0
Volume Module:												
Base Vol:	96	28	0	0	15	1	0	0	0	83	864	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	96	28	0	0	15	1	0	0	0	83	864	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	105	31	0	0	16	1	0	0	0	91	944	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	105	31	0	0	16	1	0	0	0	91	944	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.05	1.05
Final Vol.:	105	31	0	0	16	1	0	0	0	95	991	3
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	1.00	1.00	0.86	0.86	1.00	1.00	1.00	0.96	0.96	0.96
Lanes:	0.77	0.23	0.00	0.00	0.94	0.06	0.00	0.00	0.00	0.17	1.82	0.01
Final Sat.:	1322	390	0	0	1545	97	0	0	0	319	3330	10
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.30	0.30	0.30
Crit Moves:		****									****	
Green/Cycle:	0.18	0.18	0.00	0.00	0.18	0.18	0.00	0.00	0.00	0.67	0.67	0.67
Volume/Cap:	0.44	0.44	0.00	0.00	0.06	0.06	0.00	0.00	0.00	0.44	0.44	0.44
Level Of Service Module:												
Delay/Veh:	15.9	15.9	0.0	0.0	14.2	14.2	0.0	0.0	0.0	3.2	3.2	3.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	15.9	15.9	0.0	0.0	14.2	14.2	0.0	0.0	0.0	3.2	3.2	3.2
AustraQueue:	2	0	0	0	0	0	0	0	0	1	7	0

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Forest Grove TSP Update
2020 Intersection Conditions (Mitigated)
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Level Of Service Computation Report
1994 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #20 B St/Willamina

Cycle (sec): 1 Critical Vol./Cap. (X): 0.292
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 2.2
Optimal Cycle: 0 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	0 1!	0	0	0 1!	0	0	0 1!	0	0	0 1!	0
Volume Module:												
Base Vol:	12	42	11	64	39	10	7	31	5	9	24	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	12	42	11	64	39	10	7	31	5	9	24	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	13	47	12	72	44	11	8	35	6	10	27	77
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	13	47	12	72	44	11	8	35	6	10	27	77
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	13	47	12	72	44	11	8	35	6	10	27	77
Saturation Flow Module:												
Sat/Lane:	514	514	514	689	689	689	470	470	470	391	391	391
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.18	0.65	0.17	0.57	0.34	0.09	0.16	0.72	0.12	0.09	0.24	0.67
Final Sat.:	93	336	86	391	239	60	77	336	58	34	93	264
Capacity Analysis Module:												
Vol/Sat:	0.14	0.14	0.14	0.18	0.18	0.18	0.10	0.10	0.10	0.29	0.29	0.29
Crit Moves:			****		****				****		****	
ApproachV/S:		0.14			0.18			0.10			0.29	
Level Of Service Module:												
Delay/Veh:	1.7	1.7	1.7	2.0	2.0	2.0	1.5	1.5	1.5	3.0	3.0	3.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.7	1.7	1.7	2.0	2.0	2.0	1.5	1.5	1.5	3.0	3.0	3.0
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:		1.7			2.0			1.5			3.0	
LOS by Appr:		A			A			A			A	

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Forest Grove TSP Update
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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #25 Main St/23rd Av

Average Delay (sec/veh): 1.3 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 1	0	0	0	0	0 1	0	0 1!	0	0	0	0
Volume Module:												
Base Vol:	106	135	0	0	102	20	16	0	49	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	106	135	0	0	102	20	16	0	49	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	112	142	0	0	107	21	17	0	52	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	112	142	0	0	107	21	17	0	52	0	0	0
Adjusted Volume Module:												
Grade:		0%			0%			0%			0%	
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	123	142	0	0	107	21	19	0	57	0	0	0
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.4	xxxx	2.6	xxxxx	xxxx	xxxxx
Critical Gp:	5.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	5.5	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	129	xxxx	xxxxx	xxxx	xxxx	xxxxx	372	xxxx	118	xxxx	xxxx	xxxxx
Potent Cap.:	1489	xxxx	xxxxx	xxxx	xxxx	xxxxx	645	xxxx	1207	xxxx	xxxx	xxxxx
Adj Cap:	1.00	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.91	xxxx	1.00	xxxx	xxxx	xxxxx
Move Cap.:	1489	xxxx	xxxxx	xxxx	xxxx	xxxxx	587	xxxx	1207	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	2.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.3	xxxx	3.1	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	958	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	3.9	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:		1.2			0.0			3.9			0.0	

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

Intersection #33 Thatcher Rd/Watercrest Rd

Average Delay (sec/veh): 7.5 Worst Case Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 1	0	0	0 0	1!	0 0	0 0	1!	0 0	0 0	0	1 0
Volume Module:												
Base Vol:	25	36	0	385	51	49	29	90	24	0	174	498
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	25	36	0	385	51	49	29	90	24	0	174	498
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	27	38	0	411	54	52	31	96	26	0	186	531
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	27	38	0	411	54	52	31	96	26	0	186	531
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	29	38	0	452	54	52	34	106	28	0	204	585
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx	3.4	3.3	2.6	xxxxx	3.3	2.6
Critical Gp:	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx	6.5	6.0	5.5	xxxxx	6.0	5.5
Capacity Module:												
Cnflict Vol:	107	xxxx	xxxxx	38	xxxx	xxxxx	915	557	81	xxxx	583	38
Potent Cap.:	1525	xxxx	xxxxx	1644	xxxx	xxxxx	313	557	1260	xxxx	540	1324
Adj Cap:	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx	0.25	0.69	1.00	xxxx	0.69	1.00
Move Cap.:	1525	xxxx	xxxxx	1644	xxxx	xxxxx	78	386	1260	xxxx	374	1324
Level Of Service Module:												
Stopped Del:	2.4	xxxx	xxxxx	2.9	xxxx	xxxxx	76.1	12.4	2.9	xxxxx	19.1	4.5
LOS by Move:	A	*	*	A	*	*	F	F	*	F	*	*
Movement:	LT	- LTR	- RT	LT	- LTR	- RT	LT	- LTR	- RT	LT	- LTR	- RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	229	xxxxx	xxxx	xxxx	798
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	23.7	xxxxx	xxxxx	xxxx	8.3
Shared LOS:	*	*	*	*	*	*	*	D	*	*	*	B
ApproachDel:	1.0			2.4			23.7			8.3		

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Level Of Service Computation Report
1994 HCM Unsignalized Method (Base Volume Alternative)

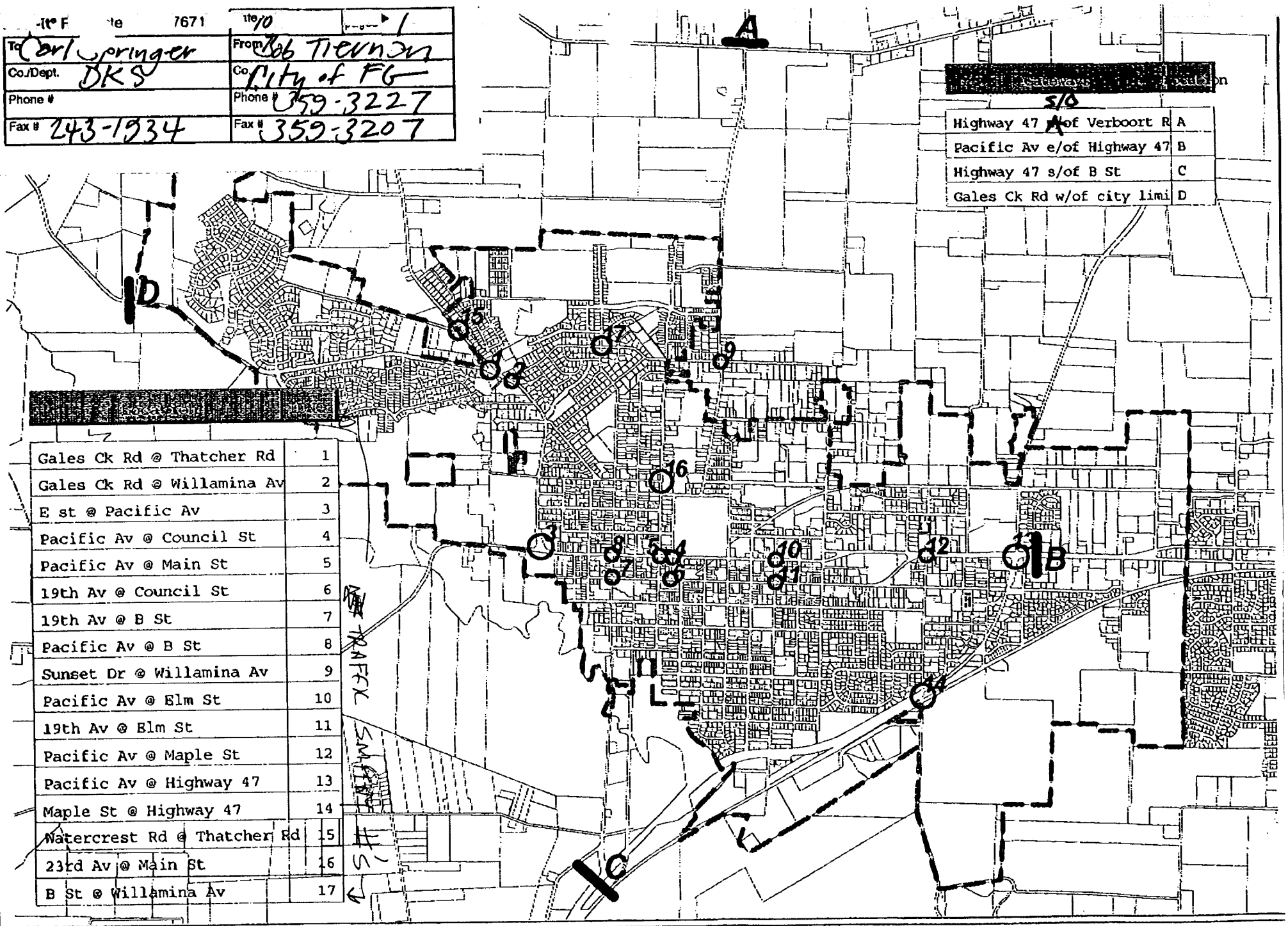
Intersection #39 Sunset/Willamina

Average Delay (sec/veh): 2.4 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1!	0 0	0 0	1!	0 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	62	366	13	28	276	138	74	5	31	28	8	31
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	62	366	13	28	276	138	74	5	31	28	8	31
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	65	384	14	29	290	145	78	5	33	29	8	33
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	65	384	14	29	290	145	78	5	33	29	8	33
Adjusted Volume Module:												
Grade:	0%			0%			0%			0%		
% Cycle/Cars:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
% Truck/Comb:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
PCE Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10
Cycl/Car PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Trck/Cmb PCE:	xxxx	xxxx		xxxx	xxxx		xxxx	xxxx		xxxx	xxxx	
Adj Vol.:	72	384	14	32	290	145	86	6	36	32	9	36
Critical Gap Module:												
MoveUp Time:	2.1	xxxx	xxxxx	2.1	xxxx	xxxxx	3.4	3.3	2.6	3.4	3.3	2.6
Critical Gp:	5.0	xxxx	xxxxx	5.0	xxxx	xxxxx	6.5	6.0	5.5	6.5	6.0	5.5
Capacity Module:												
Cnflict Vol:	435	xxxx	xxxxx	398	xxxx	xxxxx	869	855	362	867	921	391
Potent Cap.:	1064	xxxx	xxxxx	1108	xxxx	xxxxx	333	388	907	333	359	877
Adj Cap:	1.00	xxxx	xxxxx	1.00	xxxx	xxxxx	0.85	0.88	1.00	0.86	0.88	1.00
Move Cap.:	1064	xxxx	xxxxx	1108	xxxx	xxxxx	282	340	907	286	314	877
Level Of Service Module:												
Stopped Del:	3.6	xxxx	xxxxx	3.3	xxxx	xxxxx	17.6	10.7	4.1	14.0	11.8	4.3
LOS by Move:	A	*	*	A	*	*	C	B	*	B	B	*
Movement:	LT	- LTR	- RT	LT	- LTR	- RT	LT	- LTR	- RT	LT	- LTR	- RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	354	xxxxx	xxxx	422	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	13.5	xxxxx	xxxxx	9.2	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	B	*
ApproachDel:	0.5			0.2			13.5			9.2		

Traffic Counts

To: Carl Springer	From: Bob Tiernan
Co./Dept. DKS	Co. City of FG
Phone #	Phone # 359-3227
Fax # 243-1934	Fax # 359-3207

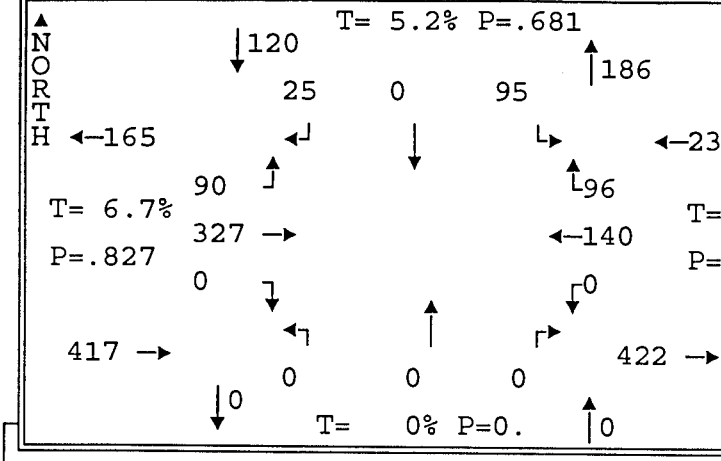


TSP Proposed Traffic Count Locations

Intersections to be counted
Gateways to be counted
City Limits

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
GALES CREEK ROAD AT THATCHER ROAD

17697



DATE OF COUNT: 10/21/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

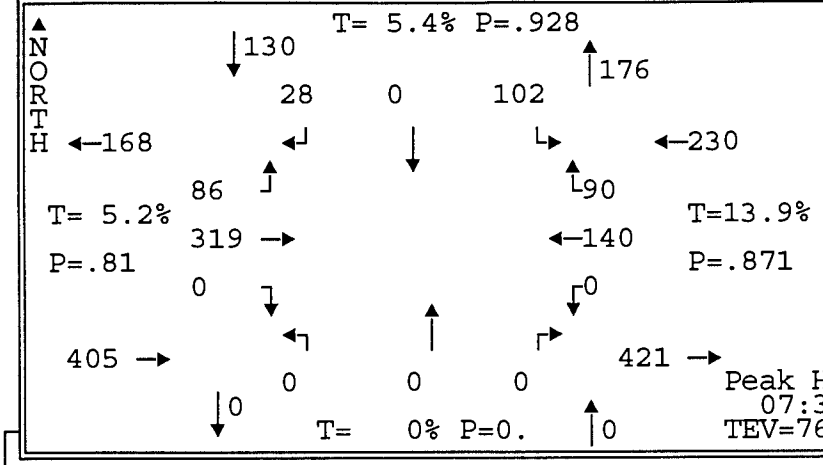
NSBC

Peak Hour
07:10-08:10
TEV=773

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	0	18	3	1	0	6	0	0	0	0	3	6	37
07:05-07:10	0	24	3	3	0	5	0	0	0	0	7	0	42
07:10-07:15	0	17	3	2	0	6	0	0	0	0	6	4	38
07:15-07:20	0	22	4	1	0	2	0	0	0	0	12	12	53
07:20-07:25	0	16	5	1	0	7	0	0	0	0	9	5	43
07:25-07:30	0	33	4	0	0	5	0	0	0	0	9	8	59
07:30-07:35	0	23	12	5	0	6	0	0	0	0	17	9	72
07:35-07:40	0	32	16	1	0	7	0	0	0	0	11	7	74
07:40-07:45	0	24	7	3	0	12	0	0	0	0	10	4	60
07:45-07:50	0	24	15	3	0	5	0	0	0	0	9	13	69
07:50-07:55	0	37	8	2	0	8	0	0	0	0	12	12	79
07:55-08:00	0	35	6	4	0	13	0	0	0	0	10	10	78
08:00-08:05	0	35	5	2	0	14	0	0	0	0	26	8	90
08:05-08:10	0	29	5	1	0	10	0	0	0	0	9	4	58
08:10-08:15	0	10	2	0	0	7	0	0	0	0	4	3	26
08:15-08:20	0	23	2	2	0	8	0	0	0	0	11	4	50
08:20-08:25	0	21	1	3	0	7	0	0	0	0	10	6	48
08:25-08:30	0	26	7	2	0	5	0	0	0	0	11	10	61
08:30-08:35	0	17	2	3	0	6	0	0	0	0	15	3	46
08:35-08:40	0	23	1	0	0	6	0	0	0	0	14	7	51
08:40-08:45	0	24	1	2	0	9	0	0	0	0	10	4	50
08:45-08:50	0	22	2	1	0	3	0	0	0	0	14	4	46
08:50-08:55	0	42	1	1	0	8	0	0	0	0	18	5	75
08:55-09:00	0	34	1	0	0	4	0	0	0	0	13	3	55
Total Survey	0	611	116	43	0	169	0	0	0	0	270	151	1360
PHF	0	.76	.59	.69	0	.64	0	0	0	0	.73	.69	.782
% Trucks	0	7	5.2	7	0	4.7	0	0	0	0	17.4	6.6	8.6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	1	0	0	0	0	0	1	0	
Hourly Totals													
07:00-08:00	0	305	86	26	0	82	0	0	0	0	115	90	704
07:15-08:15	0	320	89	23	0	96	0	0	0	0	138	95	761
07:30-08:30	0	319	86	28	0	102	0	0	0	0	140	90	765
07:45-08:45	0	304	55	24	0	98	0	0	0	0	141	84	706
08:00-09:00	0	306	30	17	0	87	0	0	0	0	155	61	656

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
GALES CREEK ROAD AT THATCHER ROAD



DATE OF COUNT: 10/21/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

NSBC

Traffic Smithy
(503)641-6333

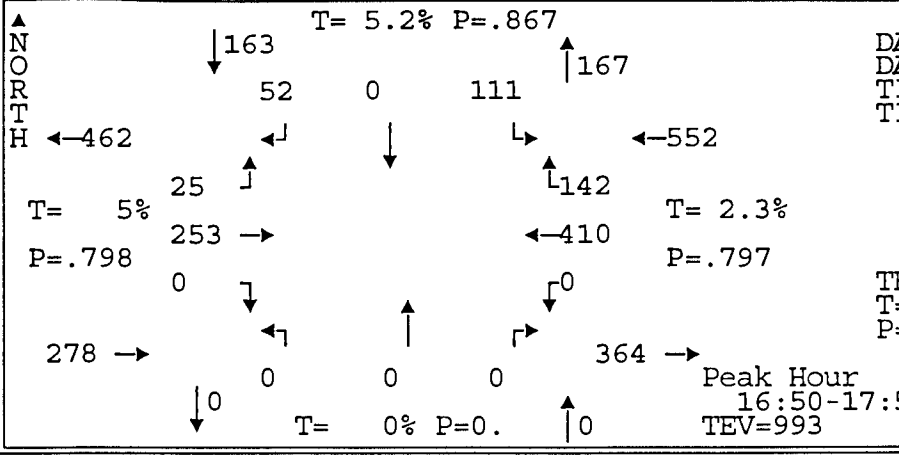
TIME PERIOD FROM - TO	EAST BOUND			SOUTH BOUND			NORTH BOUND			WEST BOUND			ALL
ALL VEHICLES													
07:30-07:45	0	79	35	9	0	25	0	0	0	0	38	20	206
07:45-08:00	0	96	29	9	0	26	0	0	0	0	31	35	226
08:00-08:15	0	74	12	3	0	31	0	0	0	0	39	15	174
08:15-08:30	0	70	10	7	0	20	0	0	0	0	32	20	159
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:30-07:45	0	2	2	0	0	2	0	0	0	0	2	2	10
07:45-08:00	0	3	0	1	0	1	0	0	0	0	2	4	11
08:00-08:15	0	2	0	0	0	1	0	0	0	0	1	0	4
08:15-08:30	0	0	1	1	0	0	0	0	0	0	2	2	6
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:30-07:45	0	0	0	0	0	0	0	0	0	0	2	0	2
07:45-08:00	0	1	0	0	0	1	0	0	0	0	1	0	3
08:00-08:15	0	2	0	0	0	0	0	0	0	0	2	0	4
08:15-08:30	0	1	1	0	0	0	0	0	0	0	2	0	4
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:30-07:45	0	0	0	0	0	0	0	0	0	0	1	0	1
07:45-08:00	0	1	0	0	0	0	0	0	0	0	1	0	2
08:00-08:15	0	1	0	0	0	0	0	0	0	0	4	0	5
08:15-08:30	0	4	0	0	0	0	0	0	0	0	4	0	8
BICYCLES													
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	2	1	0	0	0	0	0	0	0	0	0	3
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	0	1	0	0	0	0	0	0	0	0	0	0	1

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
07:30-07:45	0	0	0	1	1
07:45-08:00	0	0	0	0	0
08:00-08:15	0	0	0	0	0
08:15-08:30	0	0	0	0	0

Peak Hour by Movement													
PHF	0	.83	.61	.78	0	.82	0	0	0	0	.9	.64	.846
% Trucks(all)	0	5.3	4.7	7.1	0	4.9	0	0	0	0	17.1	8.9	7.8
% Trucks(M+H)	0	3.1	1.2	0	0	1	0	0	0	0	12.1	0	3.8
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	0	305	86	26	0	82	0	0	0	0	115	90	704
07:15-08:15	0	320	89	23	0	96	0	0	0	0	138	95	761
07:30-08:30	0	319	86	28	0	102	0	0	0	0	140	90	765
07:45-08:45	0	304	55	24	0	98	0	0	0	0	141	84	706
08:00-09:00	0	306	30	17	0	87	0	0	0	0	155	61	656

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
GALES CREEK ROAD AT THATCHER ROAD

17710



DATE OF COUNT: 10/22/98
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

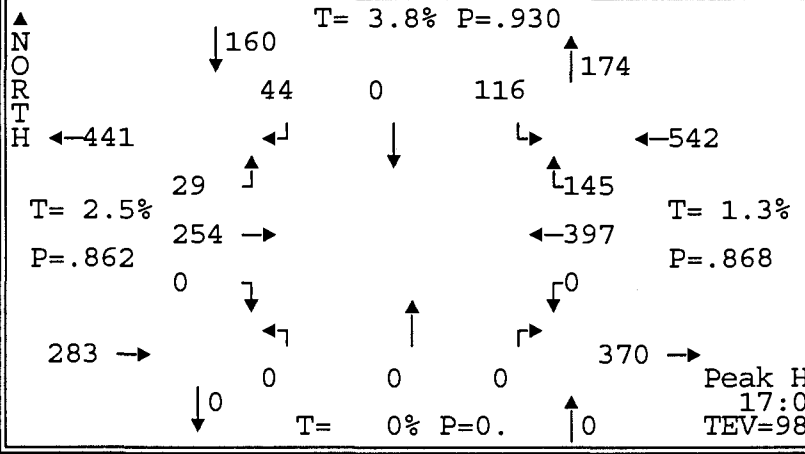
NSCD

Peak Hour
16:50-17:50
TEV=993

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	0	25	2	11	0	6	0	0	0	0	16	7	67
16:05-16:10	0	21	1	2	0	5	0	0	0	0	32	8	69
16:10-16:15	0	21	3	3	0	17	0	0	0	0	25	14	83
16:15-16:20	0	21	4	6	0	16	0	0	0	0	23	14	84
16:20-16:25	0	21	1	2	0	10	0	0	0	0	36	3	73
16:25-16:30	0	21	0	1	0	16	0	0	0	0	27	10	75
16:30-16:35	0	23	3	4	0	10	0	0	0	0	19	9	68
16:35-16:40	0	8	1	2	0	7	0	0	0	0	29	12	59
16:40-16:45	0	15	3	4	0	9	0	0	0	0	25	14	70
16:45-16:50	0	17	1	2	0	10	0	0	0	0	14	7	51
16:50-16:55	0	25	2	3	0	9	0	0	0	0	42	13	94
16:55-17:00	0	20	0	8	0	4	0	0	0	0	26	9	67
17:00-17:05	0	29	2	5	0	13	0	0	0	0	28	13	90
17:05-17:10	0	12	1	4	0	6	0	0	0	0	32	8	63
17:10-17:15	0	7	1	6	0	9	0	0	0	0	30	15	68
17:15-17:20	0	24	3	6	0	9	0	0	0	0	33	12	87
17:20-17:25	0	20	0	5	0	12	0	0	0	0	27	17	81
17:25-17:30	0	28	1	1	0	8	0	0	0	0	36	13	87
17:30-17:35	0	27	3	2	0	6	0	0	0	0	51	10	99
17:35-17:40	0	23	5	2	0	9	0	0	0	0	44	19	102
17:40-17:45	0	20	4	4	0	13	0	0	0	0	26	6	73
17:45-17:50	0	18	3	6	0	13	0	0	0	0	35	7	82
17:50-17:55	0	30	4	2	0	11	0	0	0	0	26	13	86
17:55-18:00	0	16	2	1	0	7	0	0	0	0	29	12	67
Total Survey	0	492	50	92	0	235	0	0	0	0	711	265	1845
PHF	0	.81	.52	.76	0	.79	0	0	0	0	.78	.81	.861
% Trucks	0	5.3	2	1.1	0	6.8	0	0	0	0	2.7	1.1	3.6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	0	0	0	0	0	0	5	0	
Hourly Totals													
16:00-17:00	0	238	21	48	0	119	0	0	0	0	314	120	860
16:15-17:15	0	219	19	47	0	119	0	0	0	0	331	127	862
16:30-17:30	0	228	18	50	0	106	0	0	0	0	341	142	885
16:45-17:45	0	252	23	48	0	108	0	0	0	0	389	142	962
17:00-18:00	0	254	29	44	0	116	0	0	0	0	397	145	985

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
GALES CREEK ROAD AT THATCHER ROAD



DATE OF COUNT: 10/22/98
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

NSCD

Peak Hour
17:00-18:00
TEV=985

Traffic Smithy
(503)641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ←	SOUTH BOUND ↓	SOUTH BOUND →	NORTH BOUND ↑	NORTH BOUND ←	NORTH BOUND →	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
17:00-17:15	0	48	4	15	0	28	0	0	0	0	90	36	221
17:15-17:30	0	72	4	12	0	29	0	0	0	0	96	42	255
17:30-17:45	0	70	12	8	0	28	0	0	0	0	121	35	274
17:45-18:00	0	64	9	9	0	31	0	0	0	0	90	32	235
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
17:00-17:15	0	0	0	0	0	2	0	0	0	0	2	0	4
17:15-17:30	0	0	0	0	0	2	0	0	0	0	0	1	3
17:30-17:45	0	1	0	0	0	1	0	0	0	0	0	1	3
17:45-18:00	0	0	0	0	0	0	0	0	0	0	1	0	1
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
17:00-17:15	0	2	0	0	0	0	0	0	0	0	1	0	3
17:15-17:30	0	3	0	0	0	1	0	0	0	0	0	0	4
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
17:00-17:15	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	0	1	0	0	0	0	0	0	0	0	0	0	1
17:45-18:00	0	0	0	0	0	0	0	0	0	0	0	0	0
BICYCLES													
17:00-17:15	0	1	0	0	0	0	0	0	0	0	0	0	1
17:15-17:30	0	1	0	0	0	0	0	0	0	0	1	1	3
17:30-17:45	0	0	1	0	0	0	0	0	0	0	0	1	2
17:45-18:00	0	0	0	1	0	0	0	0	0	0	1	0	2

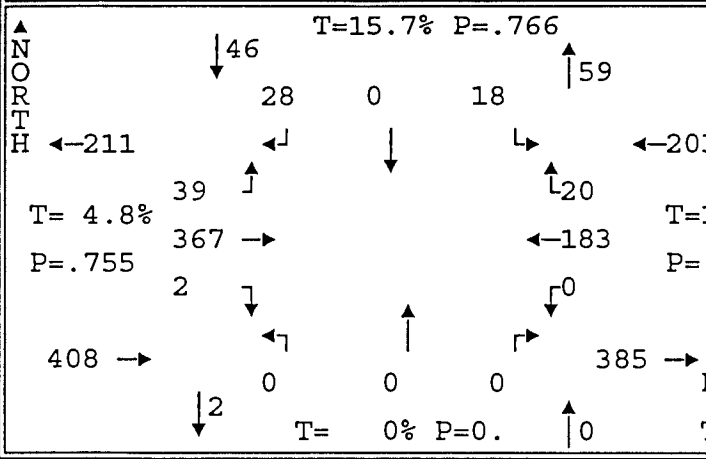
PEDESTRIANS — CROSSWALK USEAGE	SOUTH	WEST	EAST	NORTH	ALL
17:00-17:15	0	0	0	0	0
17:15-17:30	0	0	0	2	2
17:30-17:45	0	0	0	0	0
17:45-18:00	0	0	0	3	3

Peak Hour by Movement													
PHF	0	.88	.6	.73	0	.94	0	0	0	0	.82	.86	.898
% Trucks(all)	0	2.8	0	0	0	5.2	0	0	0	0	1.3	1.4	2
% Trucks(M+H)	0	2.4	0	0	0	.9	0	0	0	0	.5	0	.9
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	

Hourly Totals													
16:00-17:00	0	238	21	48	0	119	0	0	0	0	314	120	860
16:15-17:15	0	219	19	47	0	119	0	0	0	0	331	127	862
16:30-17:30	0	228	18	50	0	106	0	0	0	0	341	142	885
16:45-17:45	0	252	23	48	0	108	0	0	0	0	389	142	962
17:00-18:00	0	254	29	44	0	116	0	0	0	0	397	145	985

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
GALES CREEK ROAD AT WILLIMINA AVENUE

17829



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

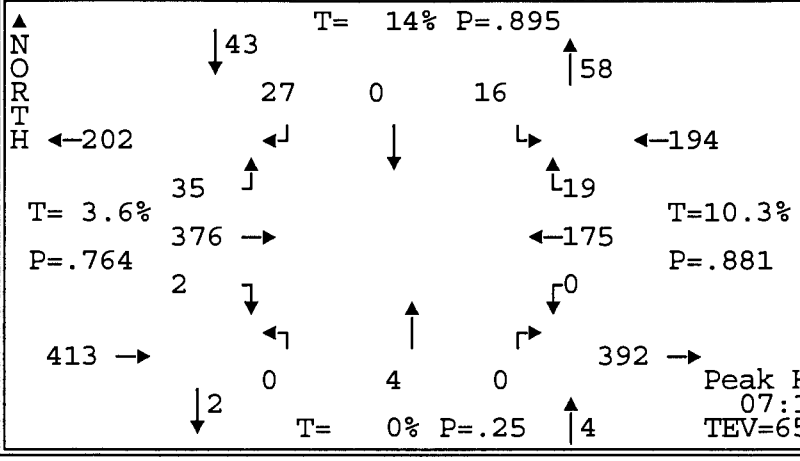
RHAC

Peak Hour
07:05-08:05
TEV=657

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	0	17	3	1	0	0	0	0	0	0	11	0	32
07:05-07:10	1	29	4	2	0	0	0	0	0	0	12	0	48
07:10-07:15	0	14	3	5	0	3	0	0	0	0	11	1	37
07:15-07:20	0	25	4	0	0	0	0	0	0	0	8	2	39
07:20-07:25	0	26	5	1	0	4	0	0	0	0	20	2	58
07:25-07:30	0	25	4	2	0	3	0	0	0	0	21	2	57
07:30-07:35	0	28	4	4	0	1	0	0	0	0	13	3	53
07:35-07:40	0	40	2	1	0	1	0	0	0	0	12	2	58
07:40-07:45	0	34	1	4	0	1	0	0	0	0	19	4	63
07:45-07:50	0	39	4	2	0	1	0	0	0	0	22	3	71
07:50-07:55	0	47	4	2	0	2	0	0	0	0	16	0	71
07:55-08:00	1	38	2	3	0	0	0	0	0	0	10	0	54
08:00-08:05	0	22	2	2	0	2	0	0	0	0	19	1	48
08:05-08:10	0	27	1	4	0	1	0	0	0	0	7	0	40
08:10-08:15	1	25	2	2	0	0	0	4	0	0	8	0	42
08:15-08:20	0	24	0	4	0	0	0	0	0	0	9	0	37
08:20-08:25	1	33	3	3	0	1	0	0	0	0	8	0	49
08:25-08:30	0	25	1	3	0	3	0	0	0	0	16	1	49
08:30-08:35	0	25	2	3	0	2	0	0	0	0	11	5	48
08:35-08:40	0	26	0	0	0	0	0	0	0	0	20	2	48
08:40-08:45	0	39	2	3	0	0	0	0	0	0	16	2	62
08:45-08:50	0	40	6	2	0	1	0	0	0	0	10	1	60
08:50-08:55	0	40	6	1	0	2	0	0	0	0	16	0	65
08:55-09:00	0	29	1	1	0	0	0	0	0	0	29	3	63
Total Survey	4	717	66	55	0	28	0	4	0	0	344	34	1252
PHF	.5	.74	.75	.78	0	.56	0	0	0	0	.8	.56	.801
% Trucks	0	5.2	1.5	20	0	7.1	0	0	0	0	9.6	20.6	7.3
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	0	0	0	5	0	0	3	0	
Hourly Totals													
07:00-08:00	2	362	40	27	0	16	0	0	0	0	175	19	641
07:15-08:15	2	376	35	27	0	16	0	4	0	0	175	19	654
07:30-08:30	3	382	26	34	0	13	0	4	0	0	159	14	635
07:45-08:45	3	370	23	31	0	12	0	4	0	0	162	14	619
08:00-09:00	2	355	26	28	0	12	0	4	0	0	169	15	611

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
GALES CREEK ROAD AT WILLIMINA AVENUE



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

RHAC

Peak Hour
07:15-08:15
TEV=654

Traffic Smithy
(503)641-6333

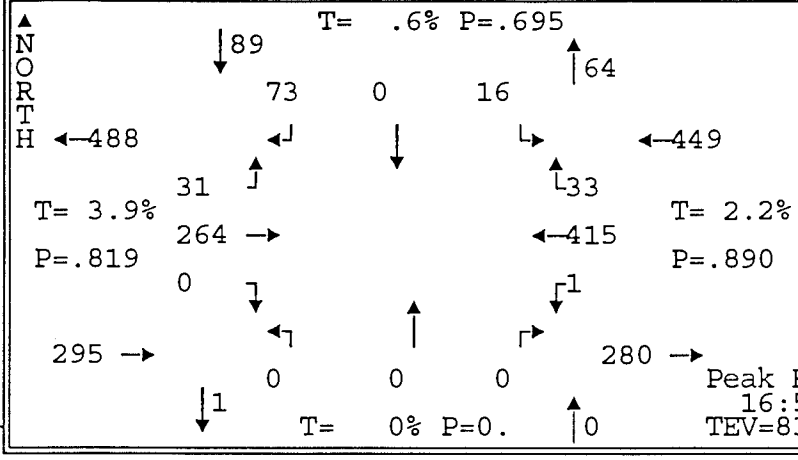
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:15-07:30	0	76	13	3	0	7	0	0	0	0	49	6	154
07:30-07:45	0	102	7	9	0	3	0	0	0	0	44	9	174
07:45-08:00	1	124	10	7	0	3	0	0	0	0	48	3	196
08:00-08:15	1	74	5	8	0	3	0	4	0	0	34	1	130
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:15-07:30	0	1	0	0	0	0	0	0	0	0	3	0	4
07:30-07:45	0	2	1	1	0	0	0	0	0	0	0	1	5
07:45-08:00	0	1	0	1	0	0	0	0	0	0	4	1	7
08:00-08:15	0	2	0	3	0	0	0	0	0	0	0	1	6
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:15-07:30	0	0	0	0	0	1	0	0	0	0	1	0	2
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	1	0	0	0	0	0	0	0	0	4	1	6
08:00-08:15	0	0	0	0	0	0	0	0	0	0	2	0	2
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:15-07:30	0	4	0	0	0	0	0	0	0	0	1	0	5
07:30-07:45	0	1	0	0	0	0	0	0	0	0	0	0	1
07:45-08:00	0	1	0	0	0	0	0	0	0	0	0	0	1
08:00-08:15	0	1	0	0	0	0	0	0	0	0	1	0	2
BICYCLES													
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	1	0	0	0	0	0	0	0	0	2	0	3
07:45-08:00	0	1	0	0	0	0	0	0	0	0	0	0	1
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
07:15-07:30	0	0	0	0	0
07:30-07:45	0	0	1	1	2
07:45-08:00	0	0	0	0	0
08:00-08:15	0	0	4	0	4

Peak Hour by Movement													
PHF	.5	.76	.67	.75	0	.57	0	.25	0	0	.89	.53	.834
% Trucks(all)	0	3.7	2.9	18.5	0	6.3	0	0	0	0	9.1	21.1	6.3
% Trucks(M+H)	0	2.1	0	0	0	6.3	0	0	0	0	5.1	5.3	2.9
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	2	362	40	27	0	16	0	0	0	0	175	19	641
07:15-08:15	2	376	35	27	0	16	0	4	0	0	175	19	654
07:30-08:30	3	382	26	34	0	13	0	4	0	0	159	14	635
07:45-08:45	3	370	23	31	0	12	0	4	0	0	162	14	619
08:00-09:00	2	355	26	28	0	12	0	4	0	0	169	15	611

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
GALES CREEK ROAD AT WILLAMINA ROAD

17733



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

SSIQ

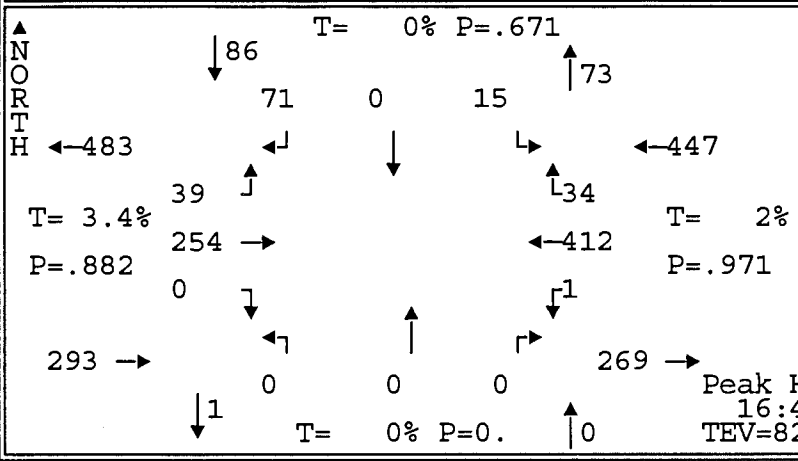
Peak Hour
16:50-17:50
TEV=833

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	0	19	2	5	0	0	0	0	1	0	31	2	60
16:05-16:10	0	26	3	10	0	1	0	0	0	0	34	1	75
16:10-16:15	0	27	4	3	0	2	0	0	0	0	35	3	74
16:15-16:20	0	28	5	4	0	2	0	0	0	0	20	0	59
16:20-16:25	0	22	2	5	0	4	0	0	0	0	26	1	60
16:25-16:30	0	20	1	3	0	2	0	0	0	0	25	1	52
16:30-16:35	0	25	2	3	0	2	0	0	0	0	24	0	56
16:35-16:40	0	17	0	5	0	1	0	0	0	0	36	2	61
16:40-16:45	0	20	3	6	0	0	0	0	0	0	26	3	58
16:45-16:50	0	16	8	1	0	0	0	0	0	0	34	3	62
16:50-16:55	0	20	1	7	0	2	0	0	0	0	26	2	58
16:55-17:00	0	33	2	11	0	2	0	0	0	1	42	3	94
17:00-17:05	0	22	3	5	0	1	0	0	0	0	31	4	66
17:05-17:10	0	26	4	3	0	3	0	0	0	0	26	3	65
17:10-17:15	0	21	7	2	0	1	0	0	0	0	44	2	77
17:15-17:20	0	23	2	4	0	1	0	0	0	0	46	3	79
17:20-17:25	0	22	2	7	0	1	0	0	0	0	28	3	63
17:25-17:30	0	14	0	2	0	1	0	0	0	0	29	2	48
17:30-17:35	0	21	6	5	0	1	0	0	0	0	33	4	70
17:35-17:40	0	19	3	8	0	0	0	0	0	0	28	1	59
17:40-17:45	0	17	1	16	0	2	0	0	0	0	45	4	85
17:45-17:50	0	26	0	3	0	1	0	0	0	0	37	2	69
17:50-17:55	0	18	1	4	0	0	0	0	0	0	32	0	55
17:55-18:00	0	20	1	10	0	2	0	0	0	0	33	2	68
Total Survey	0	522	63	132	0	32	0	0	1	1	771	51	1573
PHF	0	.81	.55	.63	0	.67	0	0	0	.25	.88	.82	.925
% Trucks	0	4	3.2	.8	0	0	0	0	0	0	2.3	0	2.7
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	2	0	0	0	0	0	0	0	0	11	0	
Hourly Totals													
16:00-17:00	0	273	33	63	0	18	0	0	1	1	359	21	769
16:15-17:15	0	270	38	55	0	20	0	0	0	1	360	24	768
16:30-17:30	0	259	34	56	0	15	0	0	0	1	392	30	787
16:45-17:45	0	254	39	71	0	15	0	0	0	1	412	34	826
17:00-18:00	0	249	30	69	0	14	0	0	0	0	412	30	804

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
GALES CREEK ROAD AT WILLAMINA ROAD

10733



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

SSIQ

Peak Hour
16:45-17:45
TEV=826

Traffic Smithy
(503)641-6333

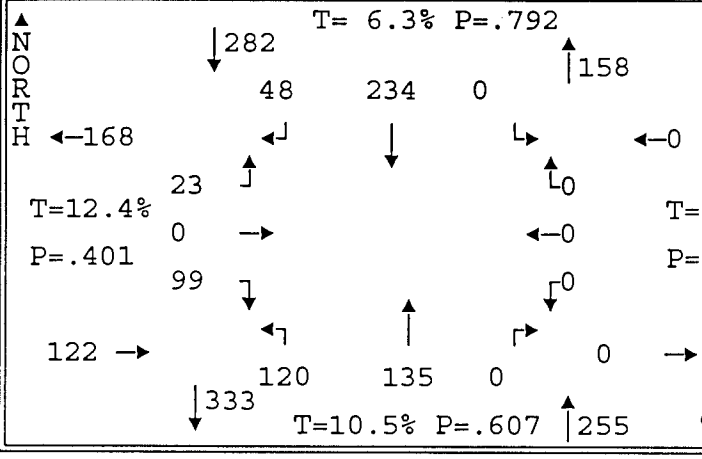
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↱	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↗	WEST BOUND ↘	WEST BOUND ←	WEST BOUND ↰	ALL
ALL VEHICLES													
16:45-17:00	0	69	11	19	0	4	0	0	0	1	102	8	214
17:00-17:15	0	69	14	10	0	5	0	0	0	0	101	9	208
17:15-17:30	0	59	4	13	0	3	0	0	0	0	103	8	190
17:30-17:45	0	57	10	29	0	3	0	0	0	0	106	9	214
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:45-17:00	0	2	1	0	0	0	0	0	0	0	2	0	5
17:00-17:15	0	1	1	0	0	0	0	0	0	0	1	0	3
17:15-17:30	0	0	0	0	0	0	0	0	0	0	1	0	1
17:30-17:45	0	1	0	0	0	0	0	0	0	0	0	0	1
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15-17:30	0	0	0	0	0	0	0	0	0	0	1	0	1
17:30-17:45	0	1	0	0	0	0	0	0	0	0	0	0	1
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	1	0	0	0	0	0	0	0	0	1	0	2
17:15-17:30	0	1	0	0	0	0	0	0	0	0	2	0	3
17:30-17:45	0	1	0	0	0	0	0	0	0	0	0	0	1
BICYCLES													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	1	0	0	0	0	0	0	0	1	0	2
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	0	0	0	0	0	0	0	0	0	0	1	0	1

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
16:45-17:00	0	0	0	0	0
17:00-17:15	0	0	0	1	1
17:15-17:30	0	0	0	0	0
17:30-17:45	0	0	0	4	4

Peak Hour by Movement													
PHF	0	.92	.7	.61	0	.75	0	0	0	.25	.97	.94	.964
% Trucks(all)	0	3.1	5.1	0	0	0	0	0	0	0	2.2	0	2.3
% Trucks(M+H)	0	1.6	0	0	0	0	0	0	0	0	1.2	0	1.1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	0	273	33	63	0	18	0	0	1	1	359	21	769
16:15-17:15	0	270	38	55	0	20	0	0	0	1	360	24	768
16:30-17:30	0	259	34	56	0	15	0	0	0	1	392	30	787
16:45-17:45	0	254	39	71	0	15	0	0	0	1	412	34	826
17:00-18:00	0	249	30	69	0	14	0	0	0	0	412	30	804

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
E STREET AT PACIFIC AVENUE

17852



DATE OF COUNT: 11/05/98
DAY OF WEEK: Thu
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ERQU

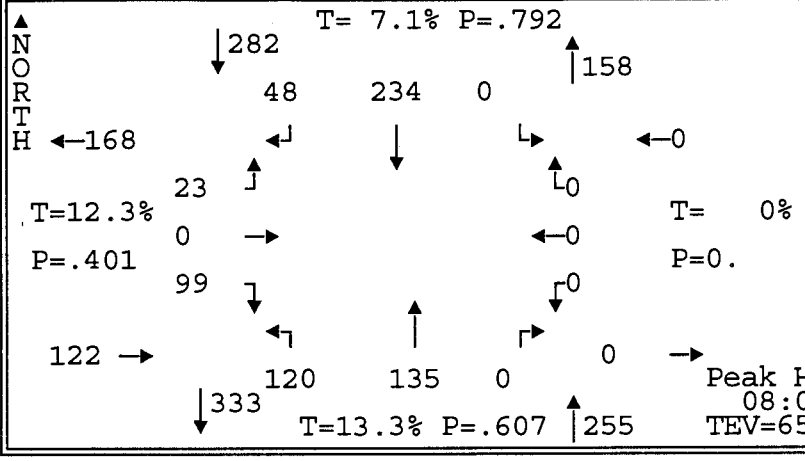
Peak Hour
08:00-09:00
TEV=659

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	3	0	0	1	15	0	7	9	0	0	0	0	35
07:05-07:10	4	0	1	0	15	0	8	8	0	0	0	0	36
07:10-07:15	2	0	0	0	26	0	14	11	0	0	0	0	53
07:15-07:20	1	0	0	1	17	0	9	12	0	0	0	0	40
07:20-07:25	4	0	0	2	29	0	12	15	0	0	0	0	62
07:25-07:30	4	0	2	7	25	0	5	16	0	0	0	0	59
07:30-07:35	7	0	2	2	20	0	5	7	0	0	0	0	43
07:35-07:40	4	0	3	0	31	0	6	11	0	0	0	0	55
07:40-07:45	1	0	1	3	36	0	3	13	0	0	0	0	57
07:45-07:50	2	0	1	2	33	0	5	11	0	0	0	0	54
07:50-07:55	7	0	1	5	28	0	7	5	0	0	0	0	53
07:55-08:00	5	0	1	0	20	0	4	16	0	0	0	0	46
08:00-08:05	2	0	1	4	27	0	9	12	0	0	0	0	55
08:05-08:10	0	0	0	2	17	0	1	9	0	0	0	0	29
08:10-08:15	2	0	1	3	19	0	5	9	0	0	0	0	39
08:15-08:20	2	0	1	0	16	0	2	8	0	0	0	0	29
08:20-08:25	6	0	1	2	17	0	10	12	0	0	0	0	48
08:25-08:30	2	0	0	1	17	0	2	7	0	0	0	0	29
08:30-08:35	2	0	1	1	11	0	5	9	0	0	0	0	29
08:35-08:40	7	0	4	7	19	0	13	20	0	0	0	0	70
08:40-08:45	8	0	6	8	22	0	7	10	0	0	0	0	61
08:45-08:50	13	0	3	4	22	0	17	11	0	0	0	0	70
08:50-08:55	25	0	3	10	21	0	28	8	0	0	0	0	95
08:55-09:00	30	0	2	6	26	0	21	20	0	0	0	0	105
Total Survey	143	0	35	71	529	0	205	269	0	0	0	0	1252
PHF	.36	0	.44	.55	.85	0	.45	.82	0	0	0	0	.610
% Trucks	14	0	5.7	11.3	5.7	0	7.3	13	0	0	0	0	8.8
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	44	0	12	23	295	0	85	134	0	0	0	0	593
07:15-08:15	39	0	13	31	302	0	71	136	0	0	0	0	592
07:30-08:30	40	0	13	24	281	0	59	120	0	0	0	0	537
07:45-08:45	45	0	18	35	246	0	70	128	0	0	0	0	542
08:00-09:00	99	0	23	48	234	0	120	135	0	0	0	0	659

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
E STREET AT PACIFIC AVENUE

17852



DATE OF COUNT: 11/05/98
DAY OF WEEK: Thu
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ERQU

Peak Hour
08:00-09:00
TEV=659

Traffic Smithy
(503)641-6333

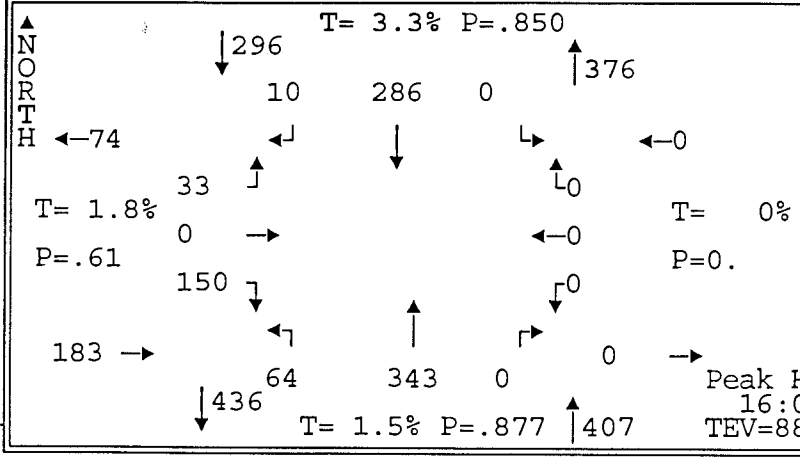
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↓	SOUTH BOUND ←	SOUTH BOUND ↑	NORTH BOUND ↓	NORTH BOUND →	NORTH BOUND ↑	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
08:00-08:15	4	0	2	9	63	0	15	30	0	0	0	0	123
08:15-08:30	10	0	2	3	50	0	14	27	0	0	0	0	106
08:30-08:45	17	0	11	16	52	0	25	39	0	0	0	0	160
08:45-09:00	68	0	8	20	69	0	66	39	0	0	0	0	270
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
08:00-08:15	0	0	0	0	0	0	1	0	0	0	0	0	1
08:15-08:30	0	0	0	0	2	0	1	1	0	0	0	0	4
08:30-08:45	1	0	1	1	3	0	0	3	0	0	0	0	9
08:45-09:00	12	0	0	6	2	0	9	2	0	0	0	0	31
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
08:00-08:15	1	0	0	0	0	0	0	5	0	0	0	0	6
08:15-08:30	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	0	0	0	0	1	0	1	2	0	0	0	0	4
08:45-09:00	0	0	0	0	2	0	0	1	0	0	0	0	3
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
08:00-08:15	0	0	0	0	0	0	0	2	0	0	0	0	2
08:15-08:30	0	0	0	0	0	0	0	2	0	0	0	0	2
08:30-08:45	0	0	0	0	2	0	0	2	0	0	0	0	4
08:45-09:00	0	0	0	0	1	0	0	2	0	0	0	0	3
BICYCLES													
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
08:00-08:15	0	0	0	0	0
08:15-08:30	0	0	0	0	0
08:30-08:45	0	0	0	0	0
08:45-09:00	0	0	0	0	0

Peak Hour by Movement													
PHF	.36	0	.52	.6	.85	0	.45	.87	0	0	0	0	.610
% Trucks(all)	14.1	0	4.3	14.6	5.6	0	10	16.3	0	0	0	0	10.5
% Trucks(M+H)	1	0	0	0	2.6	0	.8	11.9	0	0	0	0	3.6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	44	0	12	23	295	0	85	134	0	0	0	0	593
07:15-08:15	39	0	13	31	302	0	71	136	0	0	0	0	592
07:30-08:30	40	0	13	24	281	0	59	120	0	0	0	0	537
07:45-08:45	45	0	18	35	246	0	70	128	0	0	0	0	542
08:00-09:00	99	0	23	48	234	0	120	135	0	0	0	0	659

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC STREET AT E STREET

17777



DATE OF COUNT: 10/29/98
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

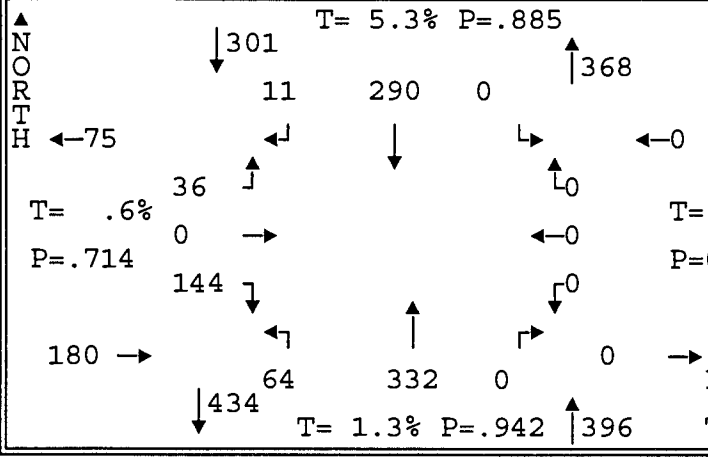
elba

Peak Hour
16:05-17:05
TEV=886

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↙	SOUTH BOUND ↓	SOUTH BOUND ↘	NORTH BOUND ↖	NORTH BOUND ↑	NORTH BOUND ↗	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	4	0	6	1	23	0	4	24	0	0	0	0	62
16:05-16:10	30	0	2	0	27	0	4	29	0	0	0	0	92
16:10-16:15	18	0	3	1	24	0	6	31	0	0	0	0	83
16:15-16:20	21	0	1	0	20	0	3	11	0	0	0	0	56
16:20-16:25	10	0	2	1	20	0	7	34	0	0	0	0	74
16:25-16:30	9	0	3	0	25	0	7	28	0	0	0	0	72
16:30-16:35	9	0	3	2	22	0	5	35	0	0	0	0	76
16:35-16:40	16	0	4	1	37	0	7	26	0	0	0	0	91
16:40-16:45	11	0	1	0	23	0	6	24	0	0	0	0	65
16:45-16:50	4	0	3	2	21	0	5	30	0	0	0	0	65
16:50-16:55	8	0	6	0	22	0	4	30	0	0	0	0	70
16:55-17:00	4	0	2	3	26	0	6	30	0	0	0	0	71
17:00-17:05	10	0	3	0	19	0	4	35	0	0	0	0	71
17:05-17:10	5	0	2	1	16	0	5	33	0	0	0	0	62
17:10-17:15	4	0	2	3	20	0	7	38	0	0	0	0	74
17:15-17:20	2	0	2	0	23	0	3	47	0	0	0	0	77
17:20-17:25	7	0	3	2	22	0	4	34	0	0	0	0	72
17:25-17:30	9	0	2	1	11	0	3	36	0	0	0	0	62
17:30-17:35	3	0	1	0	22	0	0	29	0	0	0	0	55
17:35-17:40	11	0	0	4	15	0	6	37	0	0	0	0	73
17:40-17:45	5	0	3	2	14	0	5	39	0	0	0	0	68
17:45-17:50	5	0	3	1	18	0	4	22	0	0	1	0	54
17:50-17:55	2	0	1	6	16	0	6	39	0	0	0	0	70
17:55-18:00	5	0	4	4	22	0	6	36	0	0	0	0	77
Total Survey	212	0	62	35	508	0	117	757	0	0	1	0	1692
PHF	.54	0	.75	.5	.85	0	.84	.88	0	0	0	0	.926
% Trucks	2.4	0	0	0	3.5	0	.9	1.6	0	0	0	0	2.1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	2	0	0	2	0	0	0	0	0	1	0	
Hourly Totals													
16:00-17:00	144	0	36	11	290	0	64	332	0	0	0	0	877
16:15-17:15	111	0	32	13	271	0	66	354	0	0	0	0	847
16:30-17:30	89	0	33	15	262	0	59	398	0	0	0	0	856
16:45-17:45	72	0	29	18	231	0	52	418	0	0	0	0	820
17:00-18:00	68	0	26	24	218	0	53	425	0	0	1	0	815

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC STREET AT E STREET



DATE OF COUNT: 10/29/98
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

elba

Peak Hour
16:00-17:00
TEV=877

Traffic Smithy
(503)641-6333

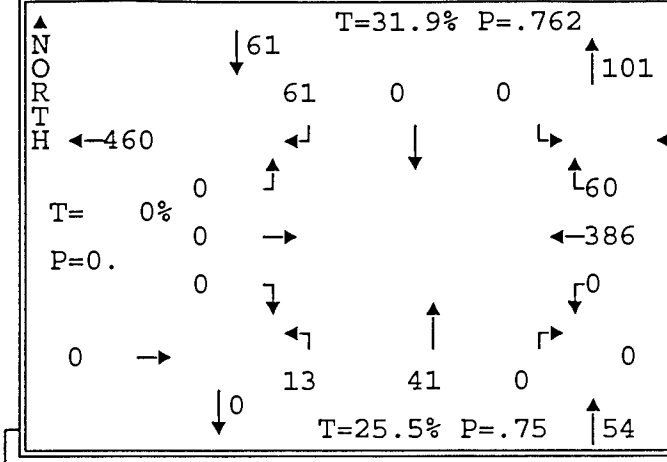
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↴	WEST BOUND ←	WEST BOUND ↰	ALL
ALL VEHICLES													
16:00-16:15	52	0	11	2	74	0	14	84	0	0	0	0	237
16:15-16:30	40	0	6	1	65	0	17	73	0	0	0	0	202
16:30-16:45	36	0	8	3	82	0	18	85	0	0	0	0	232
16:45-17:00	16	0	11	5	69	0	15	90	0	0	0	0	206
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:00-16:15	0	0	0	0	3	0	0	2	0	0	0	0	5
16:15-16:30	1	0	0	0	6	0	0	1	0	0	0	0	8
16:30-16:45	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	0	0	0	0	5	0	0	0	0	0	0	0	5
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:00-16:15	0	0	0	0	0	0	0	1	0	0	0	0	1
16:15-16:30	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	0	0	0	0	1	0	0	0	0	0	0	0	1
16:45-17:00	0	0	0	0	0	0	0	1	0	0	0	0	1
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:00-16:15	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	0	0	0	0	1	0	0	0	0	0	0	0	1
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
BICYCLES													
16:00-16:15	0	0	0	1	0	0	0	0	0	0	1	0	2
16:15-16:30	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	1	0	0	0	0	0	0	0	0	0	0	0	1
16:45-17:00	0	0	0	0	0	0	2	0	0	0	0	0	2

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
16:00-16:15	0	1	0	0	1
16:15-16:30	0	0	0	0	0
16:30-16:45	0	0	0	0	0
16:45-17:00	0	1	0	1	2

Peak Hour by Movement													
PHF	.69	0	.82	.55	.88	0	.89	.92	0	0	0	0	.925
% Trucks(all)	.7	0	0	0	5.5	0	0	1.5	0	0	0	0	2.5
% Trucks(M+H)	0	0	0	0	.7	0	0	.6	0	0	0	0	.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	144	0	36	11	290	0	64	332	0	0	0	0	877
16:15-17:15	111	0	32	13	271	0	66	354	0	0	0	0	847
16:30-17:30	89	0	33	15	262	0	59	398	0	0	0	0	856
16:45-17:45	72	0	29	18	231	0	52	418	0	0	0	0	820
17:00-18:00	68	0	26	24	218	0	53	425	0	0	1	0	815

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC AVENUE AT COLLEGE WAY

17853



DATE OF COUNT: 11/05/98
DAY OF WEEK: Thu
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

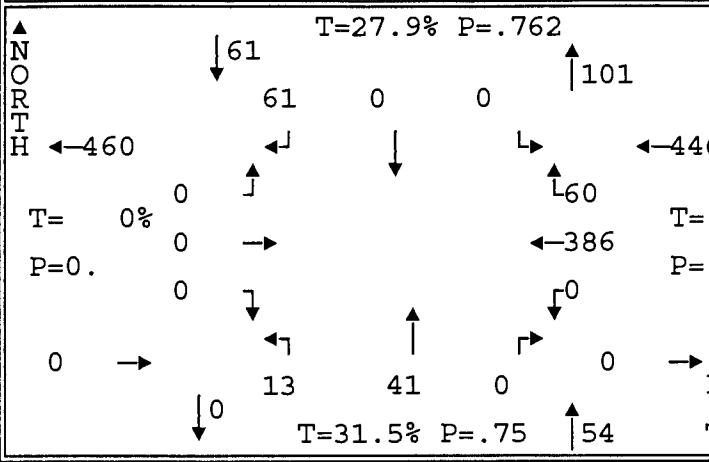
ELBC

Peak Hour
08:00-09:00
TEV=561

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	0	0	0	1	0	0	0	4	0	0	25	1	31
07:05-07:10	0	0	0	4	0	0	1	1	0	0	30	2	38
07:10-07:15	0	0	0	7	0	0	0	2	0	0	32	1	42
07:15-07:20	0	0	0	6	0	0	0	3	0	0	25	5	39
07:20-07:25	0	0	0	4	0	0	0	3	0	0	36	1	44
07:25-07:30	0	0	0	8	0	0	0	1	0	0	39	3	51
07:30-07:35	0	0	0	1	0	0	0	6	0	0	38	2	47
07:35-07:40	0	0	0	2	0	0	0	3	0	0	33	1	39
07:40-07:45	0	0	0	3	0	0	0	8	0	0	35	3	49
07:45-07:50	0	0	0	4	0	0	0	2	0	0	26	5	37
07:50-07:55	0	0	0	10	1	0	1	3	0	0	35	4	54
07:55-08:00	0	0	0	7	0	0	1	5	0	0	32	5	50
08:00-08:05	0	0	0	5	0	0	2	4	0	0	35	4	50
08:05-08:10	0	0	0	5	0	0	2	4	0	0	25	11	47
08:10-08:15	0	0	0	10	0	0	1	5	0	0	29	5	50
08:15-08:20	0	0	0	3	0	0	0	2	0	0	21	2	28
08:20-08:25	0	0	0	4	0	0	2	3	0	0	36	1	46
08:25-08:30	0	0	0	2	0	0	3	2	0	0	24	5	36
08:30-08:35	0	0	0	5	0	0	2	1	0	0	26	4	38
08:35-08:40	0	0	0	6	0	0	0	1	0	0	38	6	51
08:40-08:45	0	0	0	4	0	0	1	3	0	0	23	1	32
08:45-08:50	0	0	0	4	0	0	0	7	0	0	40	5	56
08:50-08:55	0	0	0	7	0	0	0	6	0	0	41	10	64
08:55-09:00	0	0	0	6	0	0	0	3	0	0	48	6	63
Total Survey	0	0	0	118	1	0	16	82	0	0	772	93	1082
PHF	0	0	0	.76	0	0	.46	.64	0	0	.75	.71	.766
% Trucks	0	0	0	32.2	0	0	6.3	29.3	0	0	6.7	9.7	11.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	3	0	
Peds	0	16	0	0	3	0	0	12	0	0	17	0	
Hourly Totals													
07:00-08:00	0	0	0	57	1	0	3	41	0	0	386	33	521
07:15-08:15	0	0	0	65	1	0	7	47	0	0	388	49	557
07:30-08:30	0	0	0	56	1	0	12	47	0	0	369	48	533
07:45-08:45	0	0	0	65	1	0	15	35	0	0	350	53	519
08:00-09:00	0	0	0	61	0	0	13	41	0	0	386	60	561

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC AVENUE AT COLLEGE WAY



DATE OF COUNT: 11/05/98
DAY OF WEEK: Thu
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ELBC

Peak Hour
08:00-09:00
TEV=561

Traffic Smithy
(503)641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
08:00-08:15	0	0	0	20	0	0	5	13	0	0	89	20	147
08:15-08:30	0	0	0	9	0	0	5	7	0	0	81	8	110
08:30-08:45	0	0	0	15	0	0	3	5	0	0	87	11	121
08:45-09:00	0	0	0	17	0	0	0	16	0	0	129	21	183
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
08:00-08:15	0	0	0	0	0	0	0	0	0	0	1	1	2
08:15-08:30	0	0	0	0	0	0	0	0	0	0	4	1	5
08:30-08:45	0	0	0	0	0	0	0	0	0	0	2	0	2
08:45-09:00	0	0	0	0	0	0	0	1	0	0	8	0	9
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
08:00-08:15	0	0	0	1	0	0	0	1	0	0	7	3	12
08:15-08:30	0	0	0	1	0	0	0	0	0	0	1	0	2
08:30-08:45	0	0	0	0	0	0	0	0	0	0	4	0	4
08:45-09:00	0	0	0	1	0	0	0	0	0	0	5	0	6
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
08:00-08:15	0	0	0	2	0	0	0	3	0	0	1	1	7
08:15-08:30	0	0	0	2	0	0	0	2	0	0	0	0	4
08:30-08:45	0	0	0	4	0	0	0	3	0	0	0	0	7
08:45-09:00	0	0	0	6	0	0	0	7	0	0	0	0	13
BICYCLES													
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45-09:00	0	0	0	0	0	0	0	0	0	0	0	0	0

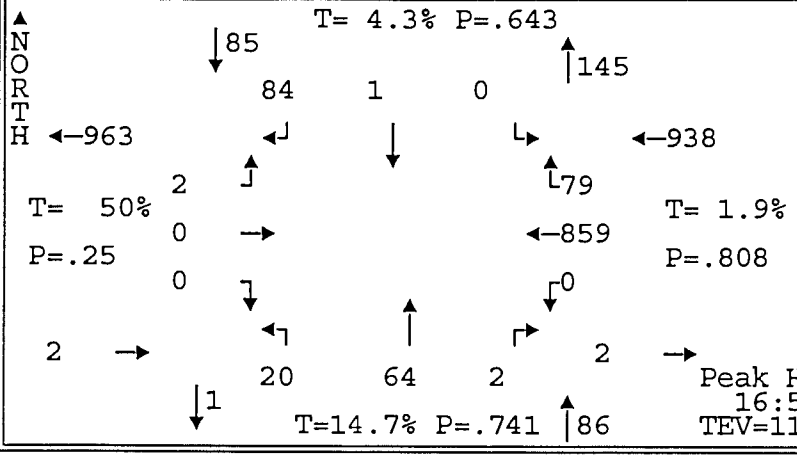
PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
08:00-08:15	2	0	1	2	5
08:15-08:30	0	0	1	2	3
08:30-08:45	3	0	4	3	10
08:45-09:00	8	2	3	6	19

Peak Hour by Movement													
PHF	0	0	0	.76	0	0	.65	.64	0	0	.75	.71	.766
% Trucks(all)	0	0	0	27.9	0	0	0	41.5	0	0	8.5	10	13
% Trucks(M+H)	0	0	0	27.9	0	0	0	39	0	0	4.7	6.7	9.8
Stopped Buses	0	0	0	0	0	0	0	0	0	0	1	0	

Hourly Totals													
07:00-08:00	0	0	0	57	1	0	3	41	0	0	386	33	521
07:15-08:15	0	0	0	65	1	0	7	47	0	0	388	49	557
07:30-08:30	0	0	0	56	1	0	12	47	0	0	369	48	533
07:45-08:45	0	0	0	65	1	0	15	35	0	0	350	53	519
08:00-09:00	0	0	0	61	0	0	13	41	0	0	386	60	561

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC AVENUE AT COLLEGE WAY

17756



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

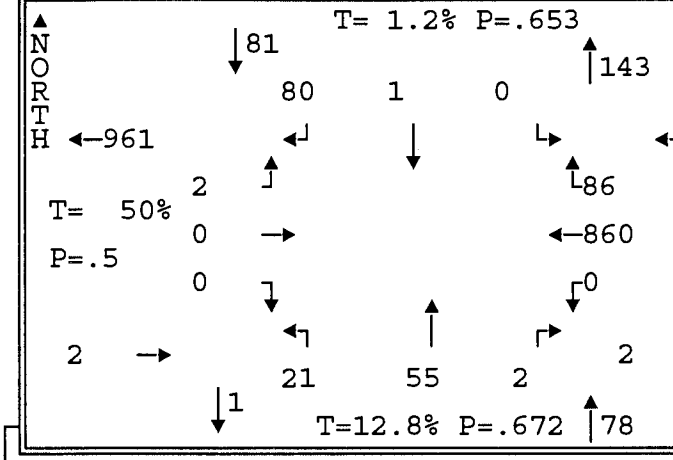
ELAY

Peak Hour
16:50-17:50
TEV=1111

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	0	0	0	9	0	0	2	9	1	0	55	5	81
16:05-16:10	0	0	0	6	0	0	1	2	0	0	61	5	75
16:10-16:15	0	0	0	10	0	0	1	8	0	0	62	7	88
16:15-16:20	0	0	0	11	0	0	2	4	0	0	70	6	93
16:20-16:25	0	0	0	16	0	0	1	11	0	0	74	10	112
16:25-16:30	0	0	0	8	0	0	1	3	0	0	67	6	85
16:30-16:35	0	0	0	4	0	0	2	7	0	0	65	3	81
16:35-16:40	0	0	0	3	0	0	2	9	0	0	63	11	88
16:40-16:45	0	0	0	11	0	0	1	5	0	0	52	2	71
16:45-16:50	0	0	0	7	0	0	1	4	0	0	67	3	82
16:50-16:55	0	0	0	10	0	0	0	7	0	0	56	4	77
16:55-17:00	0	0	0	12	0	0	0	8	0	0	71	3	94
17:00-17:05	0	0	0	1	0	0	2	5	0	0	73	8	89
17:05-17:10	0	0	0	5	0	0	9	4	0	0	63	5	86
17:10-17:15	0	0	0	2	1	0	1	1	0	0	69	9	83
17:15-17:20	0	0	0	2	0	0	2	2	0	0	59	5	70
17:20-17:25	0	0	0	8	0	0	0	5	0	0	70	10	93
17:25-17:30	0	0	0	5	0	0	1	2	0	0	64	7	79
17:30-17:35	0	0	0	6	0	0	1	9	1	0	72	6	95
17:35-17:40	0	0	0	11	0	0	2	9	1	0	129	6	158
17:40-17:45	0	0	1	14	0	0	2	4	0	0	70	7	98
17:45-17:50	0	0	1	8	0	0	0	8	0	0	63	9	89
17:50-17:55	0	0	0	9	0	0	0	2	0	0	54	6	71
17:55-18:00	0	0	0	9	0	0	1	4	0	0	74	8	96
Total Survey	0	0	2	187	1	0	35	132	3	0	1623	151	2134
PHF	0	0	.25	.64	.25	0	.42	.73	.25	0	.79	.82	.791
% Trucks	0	0	50	4.3	0	0	0	18.9	0	0	1.8	2	3.1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	5	0	
Peds	0	30	0	0	13	0	0	12	0	0	33	0	
Hourly Totals													
16:00-17:00	0	0	0	107	0	0	14	77	1	0	763	65	1027
16:15-17:15	0	0	0	90	1	0	22	68	0	0	790	70	1041
16:30-17:30	0	0	0	70	1	0	21	59	0	0	772	70	993
16:45-17:45	0	0	1	83	1	0	21	60	2	0	863	73	1104
17:00-18:00	0	0	2	80	1	0	21	55	2	0	860	86	1107

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC AVENUE AT COLLEGE WAY



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ELAY

Peak Hour
17:00-18:00
TEV=1107

Traffic Smithy
(503)641-6333

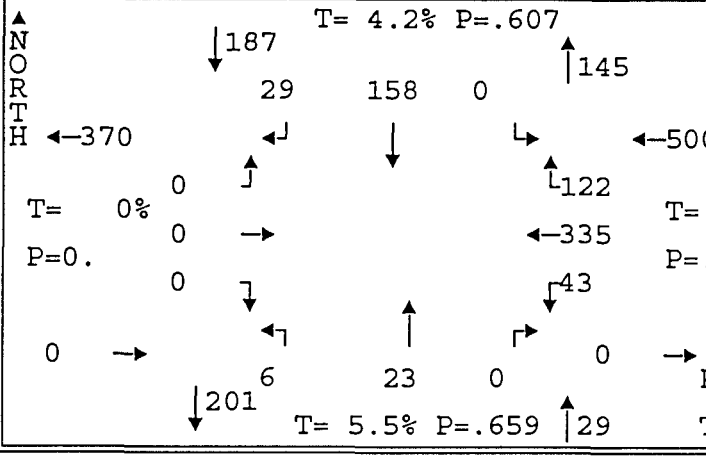
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
17:00-17:15	0	0	0	8	1	0	12	10	0	0	205	22	258
17:15-17:30	0	0	0	15	0	0	3	9	0	0	193	22	242
17:30-17:45	0	0	1	31	0	0	5	22	2	0	271	19	351
17:45-18:00	0	0	1	26	0	0	1	14	0	0	191	23	256
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
17:00-17:15	0	0	0	0	0	0	0	1	0	0	1	1	3
17:15-17:30	0	0	0	0	0	0	0	0	0	0	2	1	3
17:30-17:45	0	0	1	0	0	0	0	0	0	0	1	0	2
17:45-18:00	0	0	0	0	0	0	0	0	0	0	4	0	4
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
17:00-17:15	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15-17:30	0	0	0	1	0	0	0	0	0	0	0	0	1
17:30-17:45	0	0	0	0	0	0	0	1	0	0	0	0	1
17:45-18:00	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
17:00-17:15	0	0	0	0	0	0	0	1	0	0	0	0	1
17:15-17:30	0	0	0	0	0	0	0	2	0	0	0	0	2
17:30-17:45	0	0	0	0	0	0	0	3	0	0	0	0	3
17:45-18:00	0	0	0	0	0	0	0	2	0	0	0	0	2
BICYCLES													
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	1	1
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45-18:00	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
17:00-17:15	7	4	2	4	17
17:15-17:30	2	2	0	1	5
17:30-17:45	3	0	2	1	6
17:45-18:00	0	1	0	0	1

Peak Hour by Movement													
PHF	0	0	.5	.65	.25	0	.44	.63	.25	0	.79	.93	.788
% Trucks(all)	0	0	50	1.3	0	0	0	18.2	0	0	1	2.3	2.1
% Trucks(M+H)	0	0	0	1.3	0	0	0	16.4	0	0	.1	0	1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	3	0	
Hourly Totals													
16:00-17:00	0	0	0	107	0	0	14	77	1	0	763	65	1027
16:15-17:15	0	0	0	90	1	0	22	68	0	0	790	70	1041
16:30-17:30	0	0	0	70	1	0	21	59	0	0	772	70	993
16:45-17:45	0	0	1	83	1	0	21	60	2	0	863	73	1104
17:00-18:00	0	0	2	80	1	0	21	55	2	0	860	86	1107

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC AVENUE AT MAIN STREET

17831



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

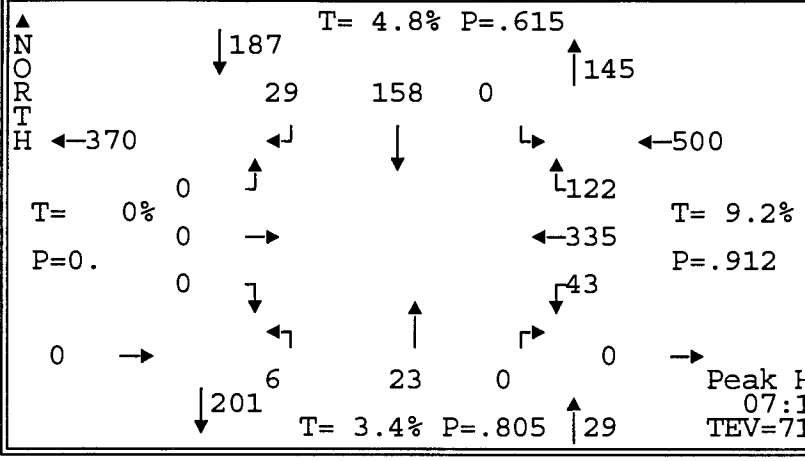
ELBB

Peak Hour
07:15-08:15
TEV=716

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	0	0	0	3	9	0	0	0	0	1	22	3	38
07:05-07:10	0	0	0	1	4	0	0	3	0	0	33	4	45
07:10-07:15	0	0	0	1	7	0	0	2	0	1	18	2	31
07:15-07:20	0	0	0	6	5	0	0	0	0	4	47	4	66
07:20-07:25	0	0	0	1	3	0	1	2	0	3	33	7	50
07:25-07:30	0	0	0	2	7	0	0	5	0	0	28	11	53
07:30-07:35	0	0	0	3	12	0	0	3	0	0	19	14	51
07:35-07:40	0	0	0	4	16	0	0	3	0	4	26	12	65
07:40-07:45	0	0	0	3	17	0	1	2	0	7	22	12	64
07:45-07:50	0	0	0	2	26	0	0	2	0	8	27	12	77
07:50-07:55	0	0	0	4	25	0	2	2	0	3	29	15	80
07:55-08:00	0	0	0	0	19	0	0	2	0	3	28	7	59
08:00-08:05	0	0	0	2	17	0	0	0	0	3	38	12	72
08:05-08:10	0	0	0	2	9	0	1	0	0	4	18	7	41
08:10-08:15	0	0	0	0	2	0	1	2	0	4	20	9	38
08:15-08:20	0	0	0	0	5	0	0	2	0	2	24	3	36
08:20-08:25	0	0	0	3	5	0	1	2	0	3	21	7	42
08:25-08:30	0	0	0	2	4	0	1	2	0	5	26	4	44
08:30-08:35	0	0	0	0	13	0	2	4	0	4	27	3	53
08:35-08:40	0	0	0	4	12	0	1	3	0	5	36	8	69
08:40-08:45	0	0	0	0	11	0	2	2	0	2	37	3	57
08:45-08:50	0	0	0	5	10	0	0	3	0	3	41	11	73
08:50-08:55	0	0	0	4	10	0	5	4	0	5	37	12	77
08:55-09:00	0	0	0	3	9	0	4	1	0	8	30	21	76
Total Survey	0	0	0	55	257	0	22	51	0	82	687	203	1357
PHF	0	0	0	.73	.56	0	.5	.52	0	.57	.78	.78	.809
% Trucks	0	0	0	5.5	3.9	0	0	7.8	0	4.9	10.8	3	7.4
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	14	0	0	13	0	0	10	0	0	16	0	
Hourly Totals													
07:00-08:00	0	0	0	30	150	0	4	26	0	34	332	103	679
07:15-08:15	0	0	0	29	158	0	6	23	0	43	335	122	716
07:30-08:30	0	0	0	25	157	0	7	22	0	46	298	114	669
07:45-08:45	0	0	0	19	148	0	11	23	0	46	331	90	668
08:00-09:00	0	0	0	25	107	0	18	25	0	48	355	100	678

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC AVENUE AT MAIN STREET



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

ELBB

Traffic Smithy
(503)641-6333

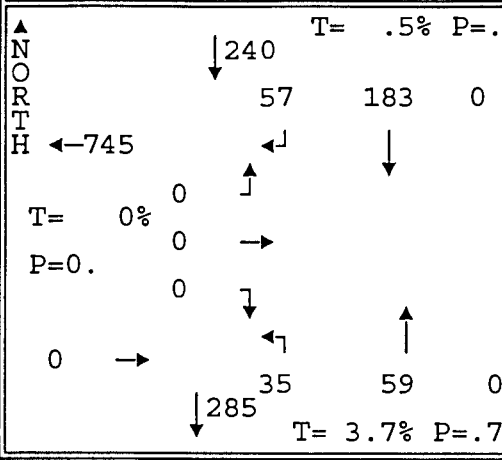
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:15-07:30	0	0	0	9	15	0	1	7	0	7	108	22	169
07:30-07:45	0	0	0	10	45	0	1	8	0	11	67	38	180
07:45-08:00	0	0	0	6	70	0	2	6	0	14	84	34	216
08:00-08:15	0	0	0	4	28	0	2	2	0	11	76	28	151
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:15-07:30	0	0	0	0	1	0	0	0	0	0	3	0	4
07:30-07:45	0	0	0	0	2	0	0	0	0	0	3	2	7
07:45-08:00	0	0	0	1	2	0	0	0	0	0	4	0	7
08:00-08:15	0	0	0	0	0	0	0	0	0	0	2	0	2
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:15-07:30	0	0	0	0	0	0	0	0	0	0	1	0	1
07:30-07:45	0	0	0	1	1	0	0	0	0	0	3	0	5
07:45-08:00	0	0	0	0	0	0	0	0	0	0	2	0	2
08:00-08:15	0	0	0	0	0	0	0	0	0	0	1	0	1
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:15-07:30	0	0	0	0	0	0	0	1	0	0	5	0	6
07:30-07:45	0	0	0	0	0	0	0	0	0	0	8	0	8
07:45-08:00	0	0	0	1	0	0	0	0	0	1	5	0	7
08:00-08:15	0	0	0	0	0	0	0	0	0	0	6	0	6
BICYCLES													
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
07:15-07:30	0	0	0	0	0
07:30-07:45	3	4	2	0	9
07:45-08:00	1	1	0	2	4
08:00-08:15	1	0	1	8	10

Peak Hour by Movement													
PHF	0	0	0	.73	.56	0	.75	.72	0	.77	.78	.8	.828
% Trucks(all)	0	0	0	10.3	3.8	0	0	4.3	0	2.3	12.8	1.6	7.8
% Trucks(M+H)	0	0	0	6.9	.6	0	0	4.3	0	2.3	9.3	0	5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	0	0	0	30	150	0	4	26	0	34	332	103	679
07:15-08:15	0	0	0	29	158	0	6	23	0	43	335	122	716
07:30-08:30	0	0	0	25	157	0	7	22	0	46	298	114	669
07:45-08:45	0	0	0	19	148	0	11	23	0	46	331	90	668
08:00-09:00	0	0	0	25	107	0	18	25	0	48	355	100	678

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC AVENUE AT MAIN STREET

17755



Peak Hour
16:10-17:10
TEV=1258

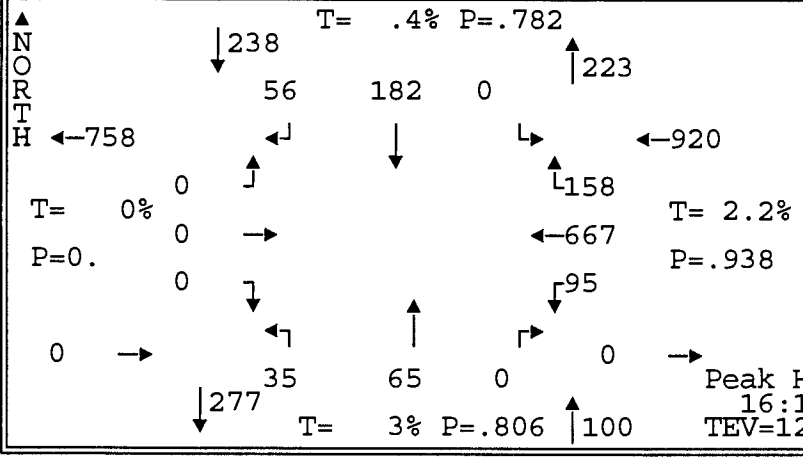
DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

PLAI

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↱	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↰	ALL
16:00-16:05	0	0	0	2	13	0	5	6	0	12	51	5	94
16:05-16:10	0	0	0	4	10	0	3	11	0	11	44	10	93
16:10-16:15	0	0	0	3	19	0	2	6	0	13	43	17	103
16:15-16:20	0	0	0	5	18	0	6	3	0	12	71	9	124
16:20-16:25	0	0	0	8	13	0	1	2	0	10	56	17	107
16:25-16:30	0	0	0	4	14	0	2	1	0	6	45	19	91
16:30-16:35	0	0	0	3	13	0	3	3	0	8	47	11	88
16:35-16:40	0	0	0	3	13	0	1	8	0	11	53	14	103
16:40-16:45	0	0	0	4	13	0	4	5	0	4	43	14	87
16:45-16:50	0	0	0	4	12	0	5	5	0	5	55	12	98
16:50-16:55	0	0	0	5	10	0	4	7	0	11	51	14	102
16:55-17:00	0	0	0	6	14	0	3	7	0	10	58	10	108
17:00-17:05	0	0	0	5	16	0	3	8	0	11	68	15	126
17:05-17:10	0	0	0	7	28	0	1	4	0	1	63	17	121
17:10-17:15	0	0	0	2	18	0	2	12	0	6	57	6	103
17:15-17:20	0	0	0	8	16	0	2	3	0	3	41	15	88
17:20-17:25	0	0	0	4	13	0	1	6	0	10	64	16	114
17:25-17:30	0	0	0	3	11	0	6	1	0	7	38	11	77
17:30-17:35	0	0	0	3	12	0	2	3	0	7	63	20	110
17:35-17:40	0	0	0	3	14	0	4	5	0	5	65	9	105
17:40-17:45	0	0	0	4	9	0	1	3	0	7	59	17	100
17:45-17:50	0	0	0	10	22	0	5	5	0	5	40	11	98
17:50-17:55	0	0	0	3	11	0	1	1	0	5	58	8	87
17:55-18:00	0	0	0	3	6	0	1	5	0	10	50	21	96
Total Survey	0	0	0	106	338	0	68	120	0	190	1283	318	2423
PHF	0	0	0	.79	.79	0	.67	.67	0	.73	.86	.9	.885
% Trucks	0	0	0	0	.6	0	2.9	4.2	0	1.6	2.7	1.6	2.1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	45	0	0	38	0	0	31	0	0	52	0	
Hourly Totals													
16:00-17:00	0	0	0	51	162	0	39	64	0	113	617	152	1198
16:15-17:15	0	0	0	56	182	0	35	65	0	95	667	158	1258
16:30-17:30	0	0	0	54	177	0	35	69	0	87	638	155	1215
16:45-17:45	0	0	0	54	173	0	34	64	0	83	682	162	1252
17:00-18:00	0	0	0	55	176	0	29	56	0	77	666	166	1225

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC AVENUE AT MAIN STREET



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

PLAI

Peak Hour
16:15-17:15
TEV=1258

Traffic Smithy
(503)641-6333

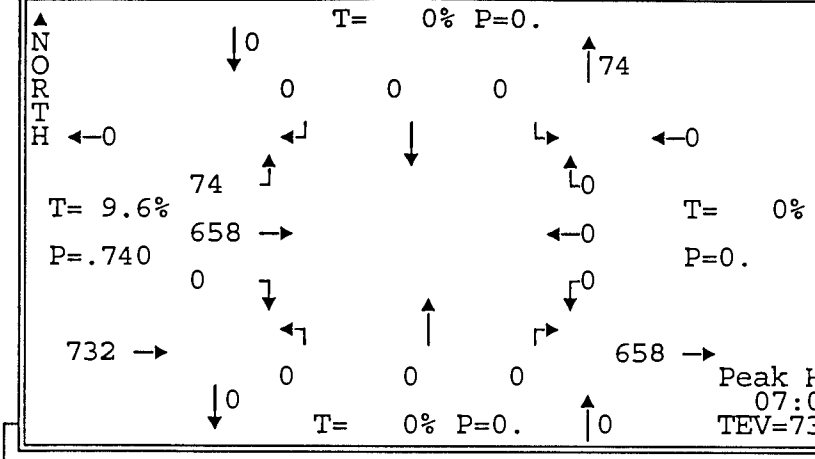
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
16:15-16:30	0	0	0	17	45	0	9	6	0	28	172	45	322
16:30-16:45	0	0	0	10	39	0	8	16	0	23	143	39	278
16:45-17:00	0	0	0	15	36	0	12	19	0	26	164	36	308
17:00-17:15	0	0	0	14	62	0	6	24	0	18	188	38	350
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:15-16:30	0	0	0	0	0	0	0	0	0	0	5	0	5
16:30-16:45	0	0	0	0	0	0	0	0	0	0	3	0	3
16:45-17:00	0	0	0	0	0	0	0	0	0	1	2	0	3
17:00-17:15	0	0	0	0	1	0	0	2	0	0	1	1	5
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:15-16:30	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:15-16:30	0	0	0	0	0	0	0	0	0	0	4	0	4
16:30-16:45	0	0	0	0	0	0	1	0	0	0	2	0	3
16:45-17:00	0	0	0	0	0	0	0	0	0	0	1	0	1
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
BICYCLES													
16:15-16:30	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	0	0	0	0	0	0	0	0	0	0	1	0	1
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
16:15-16:30	3	11	7	4	25
16:30-16:45	9	5	4	15	33
16:45-17:00	9	4	2	5	20
17:00-17:15	10	8	4	9	31

Peak Hour by Movement													
PHF	0	0	0	.82	.73	0	.73	.68	0	.85	.89	.88	.898
% Trucks(all)	0	0	0	0	.5	0	2.9	3.1	0	1.1	2.7	.6	1.9
% Trucks(M+H)	0	0	0	0	0	0	2.9	0	0	0	1	0	.6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	0	0	0	51	162	0	39	64	0	113	617	152	1198
16:15-17:15	0	0	0	56	182	0	35	65	0	95	667	158	1258
16:30-17:30	0	0	0	54	177	0	35	69	0	87	638	155	1215
16:45-17:45	0	0	0	54	173	0	34	64	0	83	682	162	1252
17:00-18:00	0	0	0	55	176	0	29	56	0	77	666	166	1225

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
19TH AVENUE AT COLLEGE WAY

17737



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ELAV

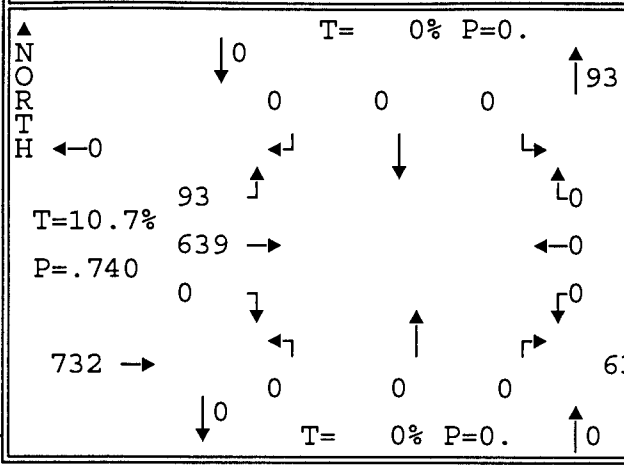
Peak Hour
07:05-08:05
TEV=732

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	0	31	4	0	0	0	0	0	0	0	0	0	35
07:05-07:10	0	41	4	0	0	0	0	0	0	0	0	0	45
07:10-07:15	0	50	6	0	0	0	0	0	0	0	0	0	56
07:15-07:20	0	36	4	0	0	0	0	0	0	0	0	0	40
07:20-07:25	0	51	4	0	0	0	0	0	0	0	0	0	55
07:25-07:30	0	38	2	0	0	0	0	0	0	0	0	0	40
07:30-07:35	0	51	3	0	0	0	0	0	0	0	0	0	54
07:35-07:40	0	52	10	0	0	0	0	0	0	0	0	0	62
07:40-07:45	0	76	4	0	0	0	0	0	0	0	0	0	80
07:45-07:50	0	81	11	0	0	0	0	0	0	0	0	0	92
07:50-07:55	0	59	3	0	0	0	0	0	0	0	0	0	62
07:55-08:00	0	81	12	0	0	0	0	0	0	0	0	0	93
08:00-08:05	0	42	11	0	0	0	0	0	0	0	0	0	53
08:05-08:10	0	35	7	0	0	0	0	0	0	0	0	0	42
08:10-08:15	0	28	7	0	0	0	0	0	0	0	0	0	35
08:15-08:20	0	42	10	0	0	0	0	0	0	0	0	0	52
08:20-08:25	0	49	6	0	0	0	0	0	0	0	0	0	55
08:25-08:30	0	43	9	0	0	0	0	0	0	0	0	0	52
08:30-08:35	0	45	6	0	0	0	0	0	0	0	0	0	51
08:35-08:40	0	42	2	0	0	0	0	0	0	0	0	0	44
08:40-08:45	0	40	4	0	0	0	0	0	0	0	0	0	44
08:45-08:50	0	37	6	0	0	0	0	0	0	0	0	0	43
08:50-08:55	0	65	5	0	0	0	0	0	0	0	0	0	70
08:55-09:00	0	60	8	0	0	0	0	0	0	0	0	0	68
Total Survey	0	1175	148	0	0	0	0	0	0	0	0	0	1323
PHF	0	.74	.71	0	0	0	0	0	0	0	0	0	.740
% Trucks	0	7.4	27	0	0	0	0	0	0	0	0	0	9.6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	1	0	0	2	0	0	0	0	0	1	0	
Hourly Totals													
07:00-08:00	0	647	67	0	0	0	0	0	0	0	0	0	714
07:15-08:15	0	630	78	0	0	0	0	0	0	0	0	0	708
07:30-08:30	0	639	93	0	0	0	0	0	0	0	0	0	732
07:45-08:45	0	587	88	0	0	0	0	0	0	0	0	0	675
08:00-09:00	0	528	81	0	0	0	0	0	0	0	0	0	609

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
19TH AVENUE AT COLLEGE WAY

17737



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ELAV

Peak Hour
07:30-08:30
TEV=732

Traffic Smithy
(503)641-6333

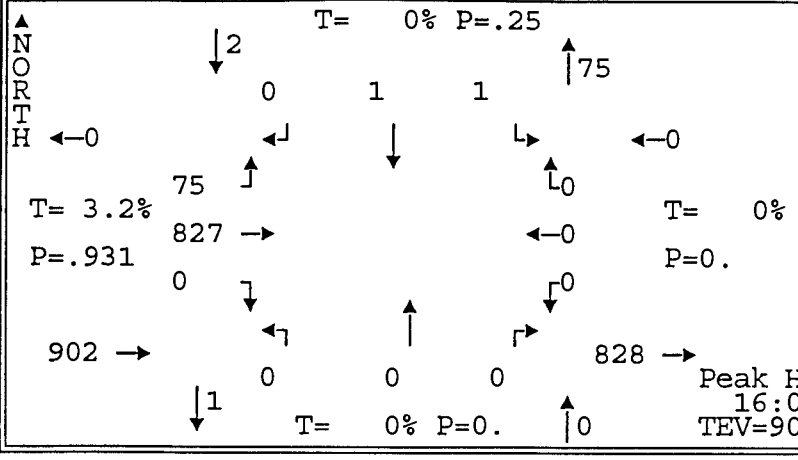
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:30-07:45	0	179	17	0	0	0	0	0	0	0	0	0	196
07:45-08:00	0	221	26	0	0	0	0	0	0	0	0	0	247
08:00-08:15	0	105	25	0	0	0	0	0	0	0	0	0	130
08:15-08:30	0	134	25	0	0	0	0	0	0	0	0	0	159
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:30-07:45	0	8	0	0	0	0	0	0	0	0	0	0	8
07:45-08:00	0	16	0	0	0	0	0	0	0	0	0	0	16
08:00-08:15	0	3	0	0	0	0	0	0	0	0	0	0	3
08:15-08:30	0	1	1	0	0	0	0	0	0	0	0	0	2
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:30-07:45	0	9	0	0	0	0	0	0	0	0	0	0	9
07:45-08:00	0	6	0	0	0	0	0	0	0	0	0	0	6
08:00-08:15	0	3	2	0	0	0	0	0	0	0	0	0	5
08:15-08:30	0	2	2	0	0	0	0	0	0	0	0	0	4
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:30-07:45	0	2	3	0	0	0	0	0	0	0	0	0	5
07:45-08:00	0	1	4	0	0	0	0	0	0	0	0	0	5
08:00-08:15	0	3	4	0	0	0	0	0	0	0	0	0	7
08:15-08:30	0	0	8	0	0	0	0	0	0	0	0	0	8
BICYCLES													
07:30-07:45	0	1	0	0	0	0	0	0	0	0	0	0	1
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
07:30-07:45	0	0	0	0	0
07:45-08:00	0	0	0	0	0
08:00-08:15	0	1	0	0	1
08:15-08:30	0	0	0	0	0

Peak Hour by Movement													
PHF	0	.72	.89	0	0	0	0	0	0	0	0	0	.740
% Trucks(all)	0	8.5	25.8	0	0	0	0	0	0	0	0	0	10.7
% Trucks(M+H)	0	4.1	24.7	0	0	0	0	0	0	0	0	0	6.7
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	0	647	67	0	0	0	0	0	0	0	0	0	714
07:15-08:15	0	630	78	0	0	0	0	0	0	0	0	0	708
07:30-08:30	0	639	93	0	0	0	0	0	0	0	0	0	732
07:45-08:45	0	587	88	0	0	0	0	0	0	0	0	0	675
08:00-09:00	0	528	81	0	0	0	0	0	0	0	0	0	609

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
19TH AVENUE AT COLLEGE WAY

17736



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ELAU

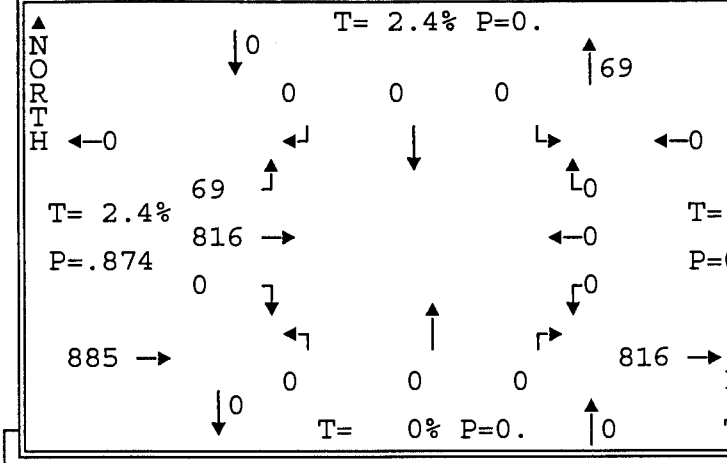
Peak Hour
16:05-17:05
TEV=904

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	0	57	10	0	0	0	0	0	0	0	0	0	67
16:05-16:10	0	76	6	0	0	0	0	0	0	0	0	0	82
16:10-16:15	0	80	4	0	0	0	0	0	0	0	0	0	84
16:15-16:20	0	73	3	0	0	0	0	0	0	0	0	0	76
16:20-16:25	0	64	4	0	0	0	0	0	0	0	0	0	68
16:25-16:30	0	60	7	0	0	0	0	0	0	0	0	0	67
16:30-16:35	0	66	11	0	0	0	0	0	0	0	0	0	77
16:35-16:40	0	70	8	0	1	1	0	0	0	0	0	0	80
16:40-16:45	0	66	8	0	0	0	0	0	0	0	0	0	74
16:45-16:50	0	58	6	0	0	0	0	0	0	0	0	0	64
16:50-16:55	0	64	10	0	0	0	0	0	0	0	0	0	74
16:55-17:00	0	62	4	0	0	0	0	0	0	0	0	0	66
17:00-17:05	0	88	4	0	0	0	0	0	0	0	0	0	92
17:05-17:10	0	71	6	0	0	0	0	0	0	0	0	0	77
17:10-17:15	0	63	3	0	0	0	0	0	0	0	0	0	66
17:15-17:20	0	59	2	0	0	0	0	0	0	0	0	0	61
17:20-17:25	0	61	6	0	0	0	0	0	0	0	0	0	67
17:25-17:30	0	57	8	0	0	0	0	0	0	0	0	0	65
17:30-17:35	0	75	7	0	0	0	0	0	0	0	0	0	82
17:35-17:40	0	97	7	0	0	0	0	0	0	0	0	0	104
17:40-17:45	0	61	6	0	0	0	0	0	0	0	0	0	67
17:45-17:50	0	48	0	0	0	0	0	0	0	0	0	0	48
17:50-17:55	0	39	5	0	0	0	0	0	0	0	0	0	44
17:55-18:00	0	51	8	0	0	0	0	0	0	0	0	0	59
Total Survey	0	1566	143	0	1	1	0	0	0	0	0	0	1711
PHF	0	.9	.69	0	.25	.25	0	0	0	0	0	0	.933
% Trucks	0	2.8	7.7	0	0	0	0	0	0	0	0	0	3.2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	1	0	0	5	0	0	1	0	0	0	0	
Hourly Totals													
16:00-17:00	0	796	81	0	1	1	0	0	0	0	0	0	879
16:15-17:15	0	805	74	0	1	1	0	0	0	0	0	0	881
16:30-17:30	0	785	76	0	1	1	0	0	0	0	0	0	863
16:45-17:45	0	816	69	0	0	0	0	0	0	0	0	0	885
17:00-18:00	0	770	62	0	0	0	0	0	0	0	0	0	832

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
19TH AVENUE AT COLLEGE WAY

17736



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ELAU

Peak Hour
16:45-17:45
TEV=885

Traffic Smithy
(503)641-6333

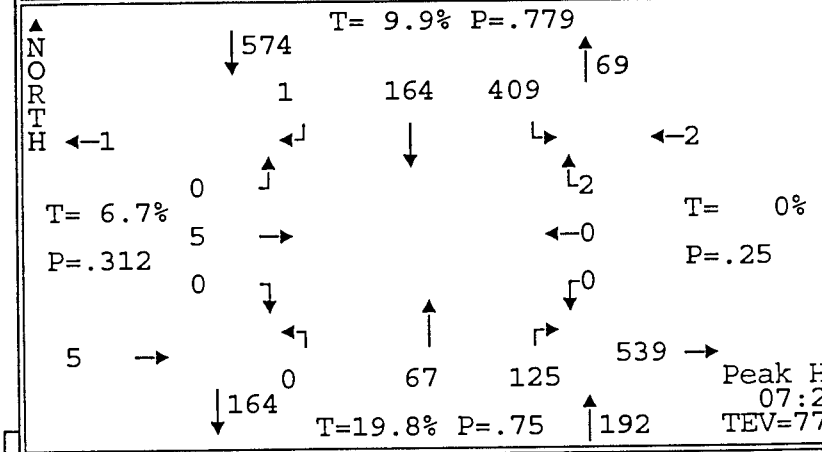
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
16:45-17:00	0	184	20	0	0	0	0	0	0	0	0	0	204
17:00-17:15	0	222	13	0	0	0	0	0	0	0	0	0	235
17:15-17:30	0	177	16	0	0	0	0	0	0	0	0	0	193
17:30-17:45	0	233	20	0	0	0	0	0	0	0	0	0	253
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:45-17:00	0	3	1	0	0	0	0	0	0	0	0	0	4
17:00-17:15	0	6	0	0	0	0	0	0	0	0	0	0	6
17:15-17:30	0	3	0	0	0	0	0	0	0	0	0	0	3
17:30-17:45	0	1	0	0	0	0	0	0	0	0	0	0	1
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:45-17:00	0	2	0	0	0	0	0	0	0	0	0	0	2
17:00-17:15	0	1	0	0	0	0	0	0	0	0	0	0	1
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	0	1	0	0	0	0	0	0	0	0	0	0	1
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	1	0	0	0	0	0	0	0	0	0	0	1
17:15-17:30	0	1	0	0	0	0	0	0	0	0	0	0	1
17:30-17:45	0	1	0	0	0	0	0	0	0	0	0	0	1
BICYCLES													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	1	0	0	0	0	0	0	0	0	0	0	1
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
16:45-17:00	1	0	0	0	1
17:00-17:15	0	1	0	0	1
17:15-17:30	0	2	0	0	2
17:30-17:45	0	0	0	0	0

Peak Hour by Movement													
PHF	0	.88	.86	0	0	0	0	0	0	0	0	0	.874
% Trucks(all)	0	2.5	1.4	0	0	0	0	0	0	0	0	0	2.4
% Trucks(M+H)	0	.9	0	0	0	0	0	0	0	0	0	0	.8
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	0	796	81	0	1	1	0	0	0	0	0	0	879
16:15-17:15	0	805	74	0	1	1	0	0	0	0	0	0	881
16:30-17:30	0	785	76	0	1	1	0	0	0	0	0	0	863
16:45-17:45	0	816	69	0	0	0	0	0	0	0	0	0	885
17:00-18:00	0	770	62	0	0	0	0	0	0	0	0	0	832

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
19TH AVENUE AT OLD HIGHWAY 47 (CB ST.)

17830



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

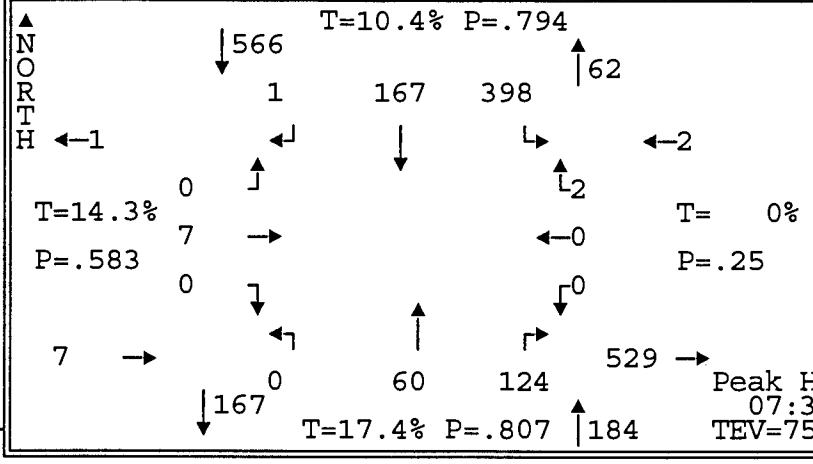
TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

JJAC

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↴	EAST BOUND →	EAST BOUND ↱	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↴	WEST BOUND ←	WEST BOUND ↰	ALL
07:00-07:05	0	2	0	0	10	23	0	7	6	0	0	0	48
07:05-07:10	0	2	0	0	8	25	0	3	9	0	0	0	47
07:10-07:15	0	0	0	1	7	24	0	8	4	0	0	0	44
07:15-07:20	0	0	0	0	21	15	0	5	2	0	0	0	43
07:20-07:25	0	0	0	0	9	22	0	10	4	0	0	0	45
07:25-07:30	0	0	0	0	9	33	0	10	6	0	0	0	58
07:30-07:35	0	0	0	0	19	30	0	3	14	0	0	0	66
07:35-07:40	0	0	0	0	16	39	0	3	14	0	0	2	74
07:40-07:45	0	1	0	0	10	49	0	13	10	0	0	0	83
07:45-07:50	0	1	0	0	18	52	0	10	14	0	0	0	95
07:50-07:55	0	2	0	0	15	38	0	2	13	0	0	0	70
07:55-08:00	0	0	0	0	22	33	0	7	8	0	0	0	70
08:00-08:05	0	0	0	0	17	24	0	4	10	0	0	0	55
08:05-08:10	0	0	0	0	8	26	0	0	8	0	0	0	42
08:10-08:15	0	0	0	0	12	24	0	2	11	0	0	0	49
08:15-08:20	0	0	0	0	8	32	0	5	8	0	0	0	53
08:20-08:25	0	1	0	1	10	29	0	8	9	0	0	0	58
08:25-08:30	0	2	0	0	12	22	0	3	5	0	0	0	44
08:30-08:35	0	0	0	1	19	21	0	4	10	0	0	0	55
08:35-08:40	0	0	0	1	8	22	0	9	11	0	0	0	51
08:40-08:45	1	3	0	0	11	33	0	7	11	0	0	0	66
08:45-08:50	0	0	0	0	21	40	0	5	13	0	0	0	79
08:50-08:55	0	0	0	0	13	49	0	11	16	0	0	0	89
08:55-09:00	0	0	0	0	19	53	0	13	10	0	0	0	95
Total Survey	1	14	0	4	322	758	0	152	226	0	0	2	1479
PHF	0	.31	0	.25	.75	.73	0	.64	.82	0	0	.25	.766
% Trucks	100	0	0	0	23.3	4.2	0	21.1	19	0	0	0	12.4
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	1	0	0	4	0	0	3	0	0	7	0	
Hourly Totals													
07:00-08:00	0	8	0	1	164	383	0	81	104	0	0	2	743
07:15-08:15	0	4	0	0	176	385	0	69	114	0	0	2	750
07:30-08:30	0	7	0	1	167	398	0	60	124	0	0	2	759
07:45-08:45	1	9	0	3	160	356	0	61	118	0	0	0	708
08:00-09:00	1	6	0	3	158	375	0	71	122	0	0	0	736

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
19TH AVENUE AT OLD HIGHWAY 47



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

JJAC

Peak Hour
07:30-08:30
TEV=759

Traffic Smithy
(503)641-6333

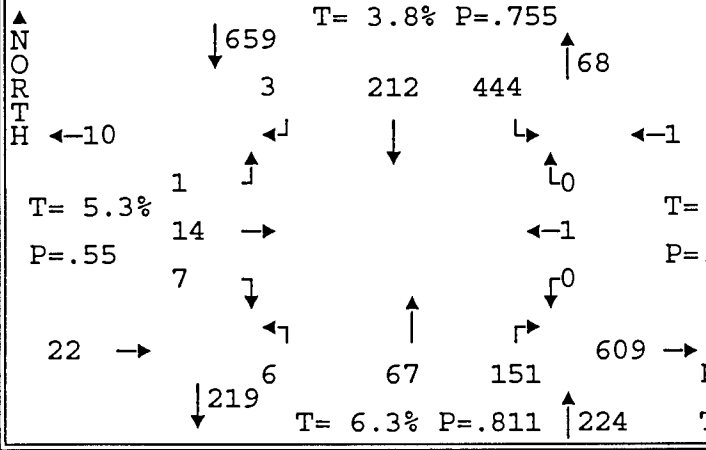
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:30-07:45	0	1	0	0	45	118	0	19	38	0	0	2	223
07:45-08:00	0	3	0	0	55	123	0	19	35	0	0	0	235
08:00-08:15	0	0	0	0	37	74	0	6	29	0	0	0	146
08:15-08:30	0	3	0	1	30	83	0	16	22	0	0	0	155
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:30-07:45	1	0	0	0	3	10	0	0	2	0	0	0	16
07:45-08:00	0	0	0	0	2	4	0	4	2	0	0	0	12
08:00-08:15	0	0	0	0	3	3	0	0	5	0	0	0	11
08:15-08:30	0	0	0	0	0	0	0	3	0	0	0	0	3
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:30-07:45	0	0	0	0	3	0	0	0	1	0	0	0	4
07:45-08:00	0	0	0	0	0	1	0	0	1	0	0	0	2
08:00-08:15	0	0	0	0	1	0	0	0	1	0	0	0	2
08:15-08:30	0	0	0	0	1	2	0	0	0	0	0	0	3
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:30-07:45	0	0	0	0	7	0	0	0	1	0	0	0	8
07:45-08:00	0	0	0	0	9	0	0	1	1	0	0	0	11
08:00-08:15	0	0	0	0	5	0	0	1	2	0	0	0	8
08:15-08:30	0	0	0	0	4	1	0	2	5	0	0	0	12
BICYCLES													
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
07:30-07:45	0	0	0	1	1
07:45-08:00	0	0	0	0	0
08:00-08:15	0	0	0	1	1
08:15-08:30	0	1	0	3	4

Peak Hour by Movement													
PHF	0	.58	0	.25	.76	.81	0	.79	.82	0	0	.25	.807
% Trucks(all)	0	0	0	0	22.8	5.3	0	18.3	16.9	0	0	0	12.1
% Trucks(M+H)	0	0	0	0	18	1	0	6.7	9.7	0	0	0	6.6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	0	8	0	1	164	383	0	81	104	0	0	2	743
07:15-08:15	0	4	0	0	176	385	0	69	114	0	0	2	750
07:30-08:30	0	7	0	1	167	398	0	60	124	0	0	2	759
07:45-08:45	1	9	0	3	160	356	0	61	118	0	0	0	708
08:00-09:00	1	6	0	3	158	375	0	71	122	0	0	0	736

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
19TH AVENUE AT OLD HIGHWAY 47 (B' St.)

17800



DATE OF COUNT: 11/03/98
DAY OF WEEK: Tue
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

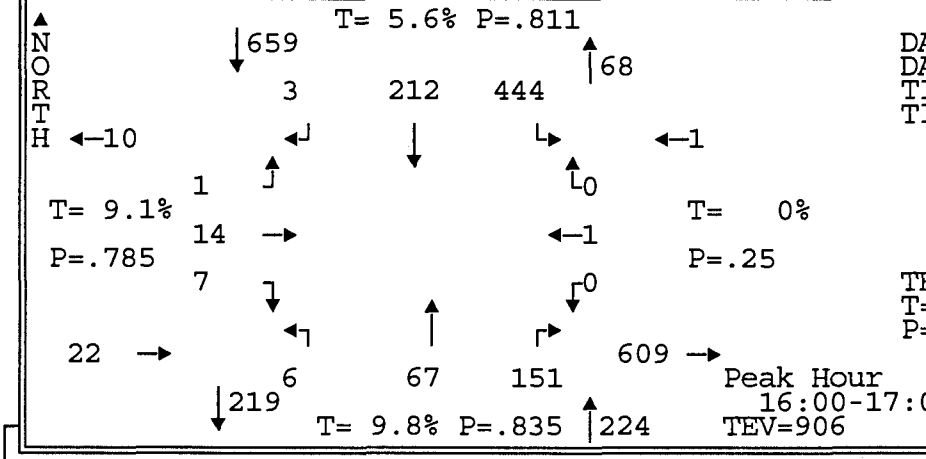
JJAC

Peak Hour
16:00-17:00
TEV=906

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	0	1	0	0	14	36	0	6	10	0	0	0	67
16:05-16:10	0	2	0	0	15	54	0	5	13	0	0	0	89
16:10-16:15	1	3	0	0	20	64	1	3	17	0	0	0	109
16:15-16:20	1	0	0	0	23	42	1	4	16	0	0	0	87
16:20-16:25	0	1	0	1	16	35	1	4	12	0	0	0	70
16:25-16:30	1	4	0	0	17	36	1	11	17	0	0	0	87
16:30-16:35	1	1	0	0	12	27	0	6	13	0	1	0	61
16:35-16:40	2	0	1	0	17	37	0	11	10	0	0	0	78
16:40-16:45	0	0	0	0	14	21	2	5	10	0	0	0	52
16:45-16:50	0	1	0	0	12	30	0	2	17	0	0	0	62
16:50-16:55	0	0	0	0	36	35	0	6	10	0	0	0	87
16:55-17:00	1	1	0	2	16	27	0	4	6	0	0	0	57
17:00-17:05	0	3	0	1	12	23	0	6	14	0	0	0	59
17:05-17:10	0	2	0	0	12	24	1	5	12	0	0	0	56
17:10-17:15	0	1	0	0	13	39	0	7	8	0	0	0	68
17:15-17:20	0	1	0	1	9	28	0	6	8	0	0	0	53
17:20-17:25	0	1	0	2	10	26	0	8	8	0	0	0	55
17:25-17:30	0	1	0	0	11	25	0	4	4	0	0	0	45
17:30-17:35	0	2	0	0	16	27	0	7	26	0	0	0	78
17:35-17:40	0	0	0	1	13	36	0	7	8	0	0	0	65
17:40-17:45	1	0	0	1	13	32	0	6	6	0	0	0	59
17:45-17:50	0	1	0	0	14	33	0	4	6	0	0	0	58
17:50-17:55	0	1	0	0	11	24	0	5	5	0	0	0	46
17:55-18:00	0	2	0	0	12	33	1	5	12	0	0	0	65
Total Survey	8	29	1	9	358	794	8	137	268	0	1	0	1613
PHF	.44	.58	.25	.38	.83	.69	.5	.6	.82	0	.25	0	.794
% Trucks	12.5	3.4	0	0	8.4	1.8	0	1.5	9	0	0	0	4.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	4	0	0	7	0	0	3	0	
Hourly Totals													
16:00-17:00	7	14	1	3	212	444	6	67	151	0	1	0	906
16:15-17:15	6	14	1	4	200	376	6	71	145	0	1	0	824
16:30-17:30	4	12	1	6	174	342	3	70	120	0	1	0	733
16:45-17:45	2	13	0	8	173	352	1	68	127	0	0	0	744
17:00-18:00	1	15	0	6	146	350	2	70	117	0	0	0	707

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
19TH AVENUE AT OLD HIGHWAY 47



DATE OF COUNT: 11/03/98
DAY OF WEEK: Tue
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

JJAC

Peak Hour
16:00-17:00
TEV=906

Traffic Smithy
(503)641-6333

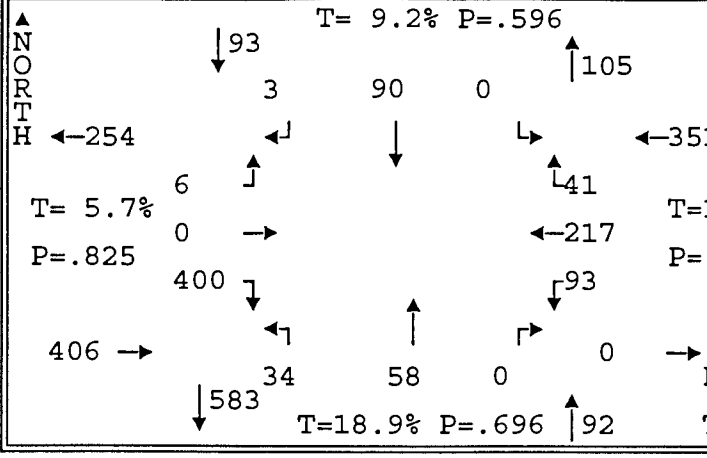
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↱	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↰	ALL
ALL VEHICLES													
16:00-16:15	1	6	0	0	49	154	1	14	40	0	0	0	265
16:15-16:30	2	5	0	1	56	113	3	19	45	0	0	0	244
16:30-16:45	3	1	1	0	43	85	2	22	33	0	1	0	191
16:45-17:00	1	2	0	2	64	92	0	12	33	0	0	0	206
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:00-16:15	0	0	0	0	6	5	0	0	3	0	0	0	14
16:15-16:30	0	0	0	0	8	3	0	1	1	0	0	0	13
16:30-16:45	1	1	0	0	3	0	0	0	0	0	0	0	5
16:45-17:00	0	0	0	0	3	0	0	0	0	0	0	0	3
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:00-16:15	0	0	0	0	0	1	0	0	0	0	0	0	1
16:15-16:30	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	0	0	0	0	0	0	0	0	3	0	0	0	3
16:45-17:00	0	0	0	0	0	2	0	0	1	0	0	0	3
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:00-16:15	0	0	0	0	1	0	0	0	2	0	0	0	3
16:15-16:30	0	0	0	0	2	0	0	1	4	0	0	0	7
16:30-16:45	0	0	0	0	3	0	0	0	4	0	0	0	7
16:45-17:00	0	0	0	0	0	0	0	0	2	0	0	0	2
BICYCLES													
16:00-16:15	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15-16:30	0	1	0	0	0	0	0	0	0	0	0	0	1
16:30-16:45	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
16:00-16:15	0	0	0	0	0
16:15-16:30	0	0	0	2	2
16:30-16:45	0	0	0	1	1
16:45-17:00	0	3	4	0	7

Peak Hour by Movement													
PHF	.58	.58	.25	.38	.83	.72	.5	.76	.84	0	.25	0	.854
% Trucks(all)	14.3	7.1	0	0	12.3	2.5	0	3	13.2	0	0	0	6.7
% Trucks(M+H)	0	0	0	0	2.8	.7	0	1.5	10.6	0	0	0	2.9
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	7	14	1	3	212	444	6	67	151	0	1	0	906
16:15-17:15	6	14	1	4	200	376	6	71	145	0	1	0	824
16:30-17:30	4	12	1	6	174	342	3	70	120	0	1	0	733
16:45-17:45	2	13	0	8	173	352	1	68	127	0	0	0	744
17:00-18:00	1	15	0	6	146	350	2	70	117	0	0	0	707

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC AVENUE AT OLD HIGHWAY 47 (B AVENUE)

17734



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

NSCE

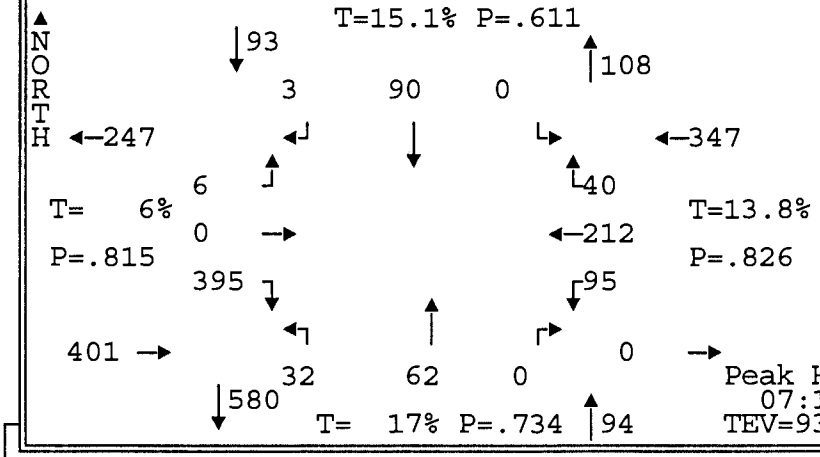
Peak Hour
07:10-08:10
TEV=942

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	22	0	1	0	4	0	2	3	0	10	20	2	64
07:05-07:10	28	1	0	1	2	0	0	4	0	7	17	1	61
07:10-07:15	25	0	0	0	4	0	3	2	0	4	21	1	60
07:15-07:20	27	0	1	1	7	0	8	2	0	7	18	1	72
07:20-07:25	30	0	0	0	3	0	0	7	0	9	22	0	71
07:25-07:30	28	0	1	0	8	0	3	4	0	7	22	4	77
07:30-07:35	33	0	0	0	2	0	7	12	0	7	20	2	83
07:35-07:40	28	0	1	1	4	0	2	3	0	4	13	8	64
07:40-07:45	40	0	1	1	12	0	1	7	0	7	10	3	82
07:45-07:50	53	0	0	0	10	0	2	12	0	9	13	7	106
07:50-07:55	25	0	1	0	16	0	4	2	0	15	20	4	87
07:55-08:00	43	0	1	0	12	0	2	4	0	9	26	2	99
08:00-08:05	36	0	0	0	5	0	1	2	0	8	21	3	76
08:05-08:10	32	0	0	0	7	0	1	1	0	7	11	6	65
08:10-08:15	20	0	0	0	4	0	1	6	0	6	16	0	53
08:15-08:20	10	0	1	0	11	0	3	3	0	4	10	2	44
08:20-08:25	24	0	1	0	7	0	2	0	0	7	18	3	62
08:25-08:30	32	1	2	0	3	0	1	2	0	6	13	1	61
08:30-08:35	19	0	0	1	4	0	7	3	0	7	14	2	57
08:35-08:40	19	0	1	1	5	0	2	1	0	5	14	4	52
08:40-08:45	17	0	0	0	5	0	4	1	0	7	17	4	55
08:45-08:50	12	0	1	0	6	0	2	3	0	3	18	5	50
08:50-08:55	28	0	1	1	12	0	6	5	0	9	18	2	82
08:55-09:00	32	0	1	4	9	0	10	1	0	15	24	4	100
Total Survey	663	2	15	11	162	0	74	90	0	179	416	71	1683
PHF	.83	0	.75	.38	.59	0	.71	.63	0	.7	.81	.57	.806
% Trucks	5.9	0	0	18.2	8.6	0	25.7	13.3	0	25.1	9.6	0	10.2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	9	0	0	1	0	0	2	0	0	8	0	
Hourly Totals													
07:00-08:00	382	1	7	4	84	0	34	62	0	95	222	35	926
07:15-08:15	395	0	6	3	90	0	32	62	0	95	212	40	935
07:30-08:30	376	1	8	2	93	0	27	54	0	89	191	41	882
07:45-08:45	330	1	7	2	89	0	30	37	0	90	193	38	817
08:00-09:00	281	1	8	7	78	0	40	28	0	84	194	36	757

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC AVENUE AT OLD HIGHWAY 47 (B AVENUE)

17734



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

NSCE

Peak Hour
07:15-08:15
TEV=935

Traffic Smithy
(503)641-6333

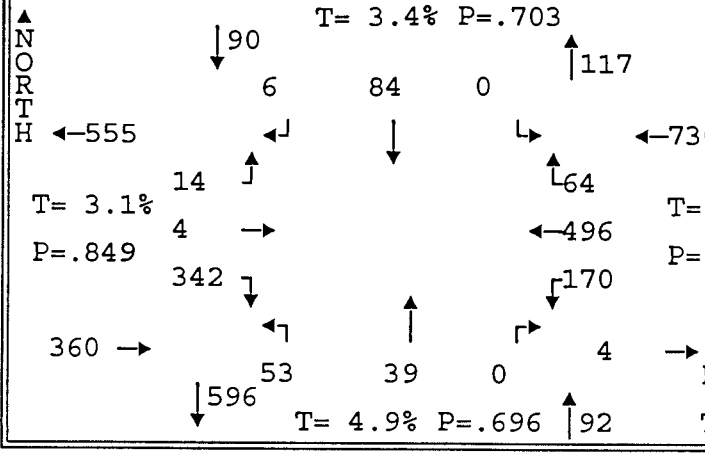
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:15-07:30	85	0	2	1	18	0	11	13	0	23	62	5	220
07:30-07:45	101	0	2	2	18	0	10	22	0	18	43	13	229
07:45-08:00	121	0	2	0	38	0	8	18	0	33	59	13	292
08:00-08:15	88	0	0	0	16	0	3	9	0	21	48	9	194
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:15-07:30	2	0	0	0	1	0	1	5	0	1	1	0	11
07:30-07:45	2	0	0	1	6	0	0	3	0	3	2	0	17
07:45-08:00	8	0	0	0	3	0	2	0	0	1	6	0	20
08:00-08:15	2	0	0	0	1	0	1	0	0	2	2	0	8
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:15-07:30	3	0	0	0	0	0	0	0	0	2	2	0	7
07:30-07:45	0	0	0	0	0	0	0	0	0	0	2	0	2
07:45-08:00	2	0	0	0	1	0	0	0	0	1	1	0	5
08:00-08:15	2	0	0	0	0	0	0	0	0	0	2	0	4
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:15-07:30	1	0	0	0	0	0	2	0	0	6	0	0	9
07:30-07:45	0	0	0	0	0	0	2	0	0	4	1	0	7
07:45-08:00	1	0	0	0	0	0	0	0	0	4	1	0	6
08:00-08:15	1	0	0	0	1	0	0	0	0	3	1	0	6
BICYCLES													
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
07:15-07:30	3	0	0	0	3
07:30-07:45	0	0	0	3	3
07:45-08:00	1	0	0	0	1
08:00-08:15	2	0	0	2	4

Peak Hour by Movement													
PHF	.82	0	.75	.38	.59	0	.73	.7	0	.72	.85	.77	.800
% Trucks(all)	6.1	0	0	33.3	14.4	0	25	12.9	0	28.4	9.9	0	10.9
% Trucks(M+H)	2.5	0	0	0	2.2	0	12.5	0	0	21.1	4.7	0	4.9
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	382	1	7	4	84	0	34	62	0	95	222	35	926
07:15-08:15	395	0	6	3	90	0	32	62	0	95	212	40	935
07:30-08:30	376	1	8	2	93	0	27	54	0	89	191	41	882
07:45-08:45	330	1	7	2	89	0	30	37	0	90	193	38	817
08:00-09:00	281	1	8	7	78	0	40	28	0	84	194	36	757

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC AVENUE AT OLD HIGHWAY 47 (B AVENUE)

17735



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

NSCF

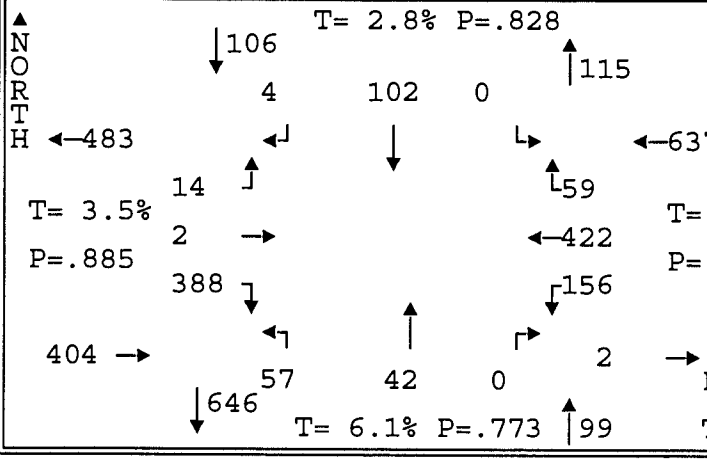
Peak Hour
16:50-17:50
TEV=1272

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	12	0	1	0	11	0	1	2	0	10	33	4	74
16:05-16:10	41	1	2	3	14	0	2	3	0	8	31	1	106
16:10-16:15	43	1	2	1	10	0	2	3	0	11	15	4	92
16:15-16:20	44	2	3	0	12	0	6	2	0	18	28	7	122
16:20-16:25	38	0	1	0	10	0	1	2	0	12	42	9	115
16:25-16:30	26	0	0	0	8	0	4	3	0	7	13	2	63
16:30-16:35	36	0	0	1	10	0	1	5	0	4	30	3	90
16:35-16:40	45	0	0	0	8	0	5	3	0	15	41	5	122
16:40-16:45	27	0	2	1	4	0	3	1	0	17	43	7	105
16:45-16:50	27	0	0	0	10	0	5	5	0	12	27	2	88
16:50-16:55	23	0	1	1	6	0	9	3	0	16	28	5	92
16:55-17:00	32	0	3	0	3	0	5	4	0	16	51	4	118
17:00-17:05	44	0	2	0	10	0	3	6	0	16	33	10	124
17:05-17:10	25	0	0	0	9	0	8	7	0	10	31	2	92
17:10-17:15	21	0	2	1	12	0	7	1	0	13	55	3	115
17:15-17:20	23	1	0	0	6	0	1	2	0	15	33	2	83
17:20-17:25	33	0	0	0	7	0	0	6	0	16	41	7	110
17:25-17:30	18	0	3	1	5	0	8	3	0	11	43	5	97
17:30-17:35	24	0	1	0	8	0	2	1	0	16	31	4	87
17:35-17:40	31	0	0	2	6	0	5	2	0	13	37	8	104
17:40-17:45	26	3	1	0	5	0	1	1	0	17	62	4	120
17:45-17:50	42	0	1	1	7	0	4	3	0	11	51	10	130
17:50-17:55	22	1	4	2	3	0	5	2	0	8	39	3	89
17:55-18:00	35	1	1	0	7	0	3	1	0	6	28	7	89
Total Survey	738	10	30	14	191	0	91	71	0	298	866	118	2427
PHF	.85	.33	.58	.5	.68	0	.74	.57	0	.89	.83	.73	.898
% Trucks	3.3	0	0	7.1	3.1	0	7.7	1.4	0	8.7	1.5	0	3.2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	4	0	0	5	0	0	11	0	
Hourly Totals													
16:00-17:00	394	4	15	7	106	0	44	36	0	146	382	53	1187
16:15-17:15	388	2	14	4	102	0	57	42	0	156	422	59	1246
16:30-17:30	354	1	13	5	90	0	55	46	0	161	456	55	1236
16:45-17:45	327	4	13	5	87	0	54	41	0	171	472	56	1230
17:00-18:00	344	6	15	7	85	0	47	35	0	152	484	65	1240

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC AVENUE AT OLD HIGHWAY 47 (B AVENUE)

17735



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

NSCF

Peak Hour
16:15-17:15
TEV=1246

Traffic Smithy
(503)641-6333

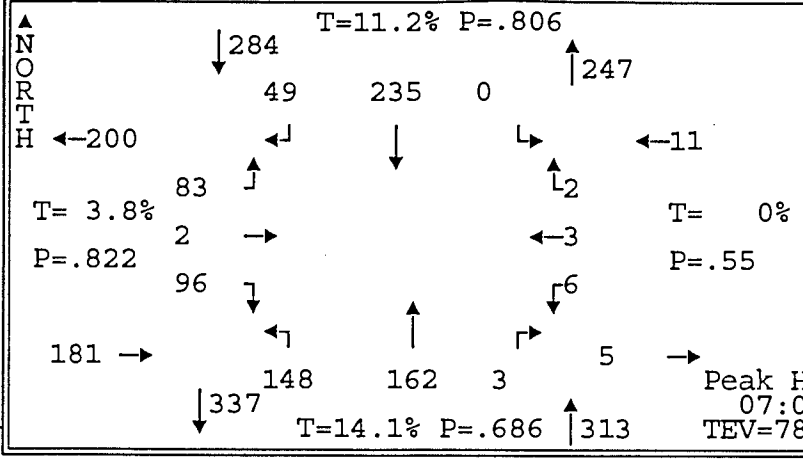
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↱	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↗	WEST BOUND ↙	WEST BOUND ←	WEST BOUND ↰	ALL
ALL VEHICLES													
16:15-16:30	108	2	4	0	30	0	11	7	0	37	83	18	300
16:30-16:45	108	0	2	2	22	0	9	9	0	36	114	15	317
16:45-17:00	82	0	4	1	19	0	19	12	0	44	106	11	298
17:00-17:15	90	0	4	1	31	0	18	14	0	39	119	15	331
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:15-16:30	8	0	0	0	0	0	1	0	2	2	0		13
16:30-16:45	2	0	0	0	1	0	0	0	0	1	0	0	4
16:45-17:00	1	0	0	0	0	0	0	0	0	3	1	0	5
17:00-17:15	1	0	0	1	1	0	2	0	0	2	0	0	7
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:15-16:30	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30-16:45	1	0	0	0	0	0	1	0	0	0	1	0	3
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:15-16:30	0	0	0	0	0	0	0	0	0	0	1	0	1
16:30-16:45	0	0	0	0	0	0	1	0	0	0	1	0	2
16:45-17:00	0	0	0	0	0	0	0	0	0	4	0	0	4
17:00-17:15	1	0	0	0	0	0	1	0	0	0	0	0	2
BICYCLES													
16:15-16:30	0	0	0	0	0	0	0	1	0	0	0	0	1
16:30-16:45	0	0	0	0	1	0	0	0	0	0	0	0	1
16:45-17:00	0	0	0	0	1	0	0	0	0	1	0	0	2
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS — CROSSWALK USEAGE	SOUTH	WEST	EAST	NORTH	ALL
16:15-16:30	0	0	2	2	4
16:30-16:45	0	0	0	0	0
16:45-17:00	0	1	0	2	3
17:00-17:15	0	0	2	2	4

Peak Hour by Movement													
PHF	.9	.25	.88	.5	.82	0	.75	.75	0	.89	.89	.82	.941
% Trucks(all)	3.6	0	0	25	2	0	8.8	2.4	0	7.7	1.4	0	3.3
% Trucks(M+H)	.5	0	0	0	0	0	5.3	0	0	2.6	.7	0	1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	394	4	15	7	106	0	44	36	0	146	382	53	1187
16:15-17:15	388	2	14	4	102	0	57	42	0	156	422	59	1246
16:30-17:30	354	1	13	5	90	0	55	46	0	161	456	55	1236
16:45-17:45	327	4	13	5	87	0	54	41	0	171	472	56	1230
17:00-18:00	344	6	15	7	85	0	47	35	0	152	484	65	1240

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
SUNSET DRIVE AT WILLAMINA AVENUE

17856



DATE OF COUNT: 11/05/98
DAY OF WEEK: Thu
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

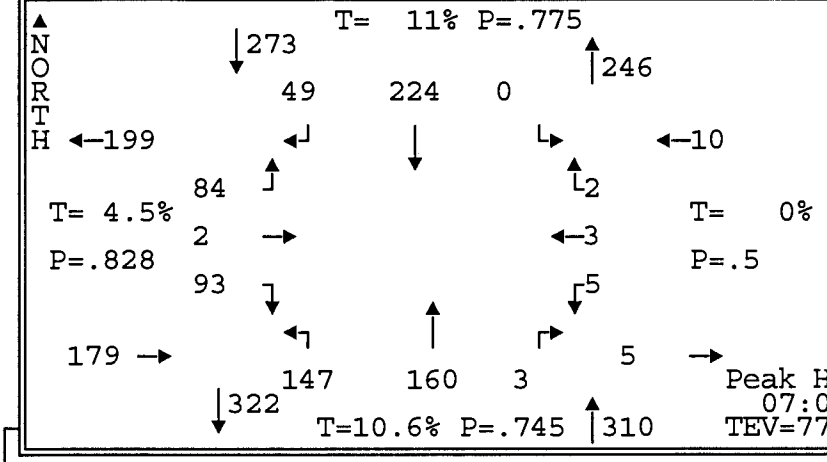
MWAB

Peak Hour
07:05-08:05
TEV=789

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	2	0	9	2	6	0	1	13	0	0	0	0	33
07:05-07:10	2	0	7	2	22	0	8	10	0	0	0	0	51
07:10-07:15	3	0	11	5	10	0	6	19	0	0	0	0	54
07:15-07:20	4	0	9	3	15	0	11	13	1	0	0	0	56
07:20-07:25	5	0	7	4	24	0	16	11	0	2	0	0	69
07:25-07:30	8	0	5	6	15	0	9	12	0	1	2	0	58
07:30-07:35	10	0	12	7	17	0	18	11	1	0	0	0	76
07:35-07:40	8	0	9	4	20	0	17	12	0	0	0	0	70
07:40-07:45	12	0	3	3	20	0	23	22	0	0	1	0	84
07:45-07:50	16	0	5	1	24	0	25	14	1	1	0	0	87
07:50-07:55	14	2	3	6	29	0	8	12	0	0	0	0	74
07:55-08:00	9	0	4	6	22	0	5	11	0	1	0	2	60
08:00-08:05	5	0	8	2	17	0	2	15	0	1	0	0	50
08:05-08:10	5	0	3	3	12	0	3	8	0	0	0	0	34
08:10-08:15	4	0	6	2	15	0	2	13	0	0	0	0	42
08:15-08:20	1	0	9	1	16	0	3	12	0	0	1	0	43
08:20-08:25	1	0	4	2	9	0	3	12	0	0	0	0	31
08:25-08:30	5	0	4	0	14	0	3	8	1	0	0	0	35
08:30-08:35	2	0	4	0	17	0	2	12	0	0	0	0	37
08:35-08:40	4	0	11	3	24	0	3	13	0	0	0	0	58
08:40-08:45	5	0	3	1	26	0	0	6	0	0	0	0	41
08:45-08:50	5	0	1	3	29	0	4	21	0	1	1	0	65
08:50-08:55	4	0	6	1	32	0	2	22	0	1	0	0	68
08:55-09:00	3	0	5	1	22	0	3	11	1	0	1	0	47
Total Survey	137	2	148	68	457	0	177	313	5	8	6	2	1323
PHF	.57	.25	.77	.72	.78	0	.57	.84	.75	.5	.38	.25	.805
% Trucks	3.6	0	4.1	2.9	12.5	0	9	17.3	0	0	0	0	10.6
Stopped Buses	0	0	0	0	0	0	0	1	0	0	0	0	
Peds	0	3	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	93	2	84	49	224	0	147	160	3	5	3	2	772
07:15-08:15	100	2	74	47	230	0	139	154	3	6	3	2	760
07:30-08:30	90	2	70	37	215	0	112	150	3	3	2	2	686
07:45-08:45	71	2	64	27	225	0	59	136	2	3	1	2	592
08:00-09:00	44	0	64	19	233	0	30	153	2	3	3	0	551

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
SUNSET DRIVE AT WILLAMINA AVENUE



DATE OF COUNT: 11/05/98
DAY OF WEEK: Thu
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

MWAB

Peak Hour
07:00-08:00
TEV=772

Traffic Smithy
(503)641-6333

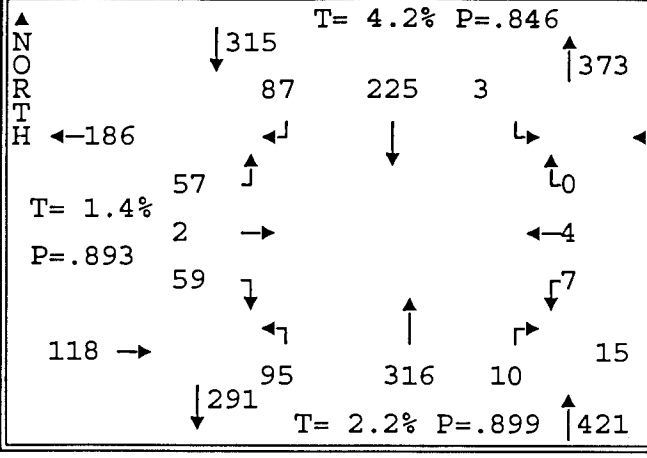
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:00-07:15	7	0	27	9	38	0	15	42	0	0	0	0	138
07:15-07:30	17	0	21	13	54	0	36	36	1	3	2	0	183
07:30-07:45	30	0	24	14	57	0	58	45	1	0	1	0	230
07:45-08:00	39	2	12	13	75	0	38	37	1	2	0	2	221
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:00-07:15	0	0	0	0	1	0	1	3	0	0	0	0	5
07:15-07:30	0	0	0	0	1	0	8	2	0	0	0	0	11
07:30-07:45	3	0	1	1	2	0	3	4	0	0	0	0	14
07:45-08:00	2	0	0	1	3	0	1	2	0	0	0	0	9
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:00-07:15	0	0	1	0	0	0	0	1	0	0	0	0	2
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	1	0	0	3	0	0	0	0	4
07:45-08:00	0	0	1	0	0	0	0	3	0	0	0	0	4
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:00-07:15	0	0	0	0	5	0	0	0	0	0	0	0	5
07:15-07:30	0	0	0	0	3	0	0	0	0	0	0	0	3
07:30-07:45	0	0	0	0	5	0	0	1	0	0	0	0	6
07:45-08:00	0	0	0	0	7	0	0	1	0	0	0	0	8
BICYCLES													
07:00-07:15	0	0	0	0	1	0	0	0	0	0	0	0	1
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
07:00-07:15	0	0	0	0	0
07:15-07:30	0	0	0	0	0
07:30-07:45	0	0	0	0	0
07:45-08:00	0	0	0	0	0

Peak Hour by Movement													
PHF	.6	.25	.78	.88	.75	0	.63	.89	.75	.42	.38	.25	.839
% Trucks(all)	5.4	0	3.6	4.1	12.5	0	8.8	12.5	0	0	0	0	9.2
% Trucks(M+H)	0	0	2.4	0	9.4	0	0	5.6	0	0	0	0	4.1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	93	2	84	49	224	0	147	160	3	5	3	2	772
07:15-08:15	100	2	74	47	230	0	139	154	3	6	3	2	760
07:30-08:30	90	2	70	37	215	0	112	150	3	3	2	2	686
07:45-08:45	71	2	64	27	225	0	59	136	2	3	1	2	592
08:00-09:00	44	0	64	19	233	0	30	153	2	3	3	0	551

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
SUNSET DRIVE AT WILLAMINA AVENUE

17738



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

PLAH

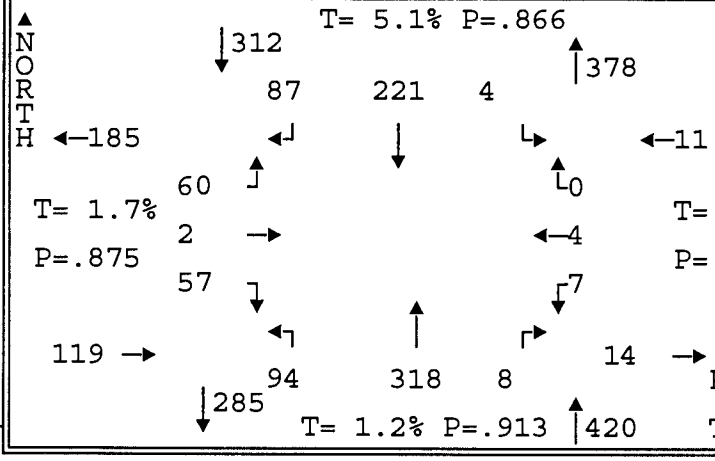
Peak Hour
16:40-17:40
TEV=865

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	5	0	6	8	17	0	6	34	0	1	0	0	77
16:05-16:10	3	0	8	8	26	0	6	25	1	0	0	0	77
16:10-16:15	3	2	3	5	20	1	5	23	1	2	0	0	65
16:15-16:20	3	0	6	5	18	0	8	23	2	0	0	0	65
16:20-16:25	1	0	4	11	22	0	6	21	0	0	2	0	67
16:25-16:30	2	0	3	4	25	0	7	18	0	0	0	0	59
16:30-16:35	4	1	8	13	24	0	5	24	2	0	0	0	81
16:35-16:40	0	0	3	9	13	0	4	23	1	2	0	0	55
16:40-16:45	4	0	5	8	22	0	6	25	2	0	0	0	72
16:45-16:50	4	0	10	8	27	0	6	22	0	0	0	0	77
16:50-16:55	7	0	3	9	19	0	14	25	0	1	0	0	78
16:55-17:00	5	0	3	7	19	1	3	30	0	0	1	0	69
17:00-17:05	8	0	2	5	14	0	6	34	1	1	0	0	71
17:05-17:10	4	1	3	8	17	0	7	35	1	1	0	0	77
17:10-17:15	5	0	4	5	20	0	6	25	0	2	0	0	67
17:15-17:20	4	0	6	6	17	0	8	28	0	1	1	0	71
17:20-17:25	5	0	6	5	12	0	12	23	2	0	0	0	65
17:25-17:30	1	0	4	5	21	1	7	21	2	0	0	0	62
17:30-17:35	3	0	7	10	19	0	12	30	2	1	1	0	85
17:35-17:40	9	1	4	11	18	1	8	18	0	0	1	0	71
17:40-17:45	2	0	8	8	18	1	5	27	0	0	0	0	69
17:45-17:50	3	1	4	11	17	0	14	21	0	0	0	0	71
17:50-17:55	10	0	4	6	23	0	10	21	0	1	0	2	77
17:55-18:00	4	0	0	4	16	0	10	27	1	1	0	0	63
Total Survey	99	6	114	179	464	5	181	603	18	14	6	2	1691
PHF	.74	.5	.79	.84	.83	.38	.77	.8	.42	.44	.5	0	.952
% Trucks	1	0	1.8	.6	5.6	0	.6	2.7	5.6	0	0	0	2.8
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	41	3	62	95	252	2	76	293	9	6	3	0	842
16:15-17:15	47	2	54	92	240	1	78	305	9	7	3	0	838
16:30-17:30	51	2	57	88	225	2	84	315	11	8	2	0	845
16:45-17:45	57	2	60	87	221	4	94	318	8	7	4	0	862
17:00-18:00	58	3	52	84	212	3	105	310	9	8	3	2	849

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
SUNSET DRIVE AT WILLAMINA AVENUE

17738



DATE OF COUNT: 10/27/98
DAY OF WEEK: Tue
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

PLAH

Peak Hour
16:45-17:45
TEV=862

Traffic Smithy
(503)641-6333

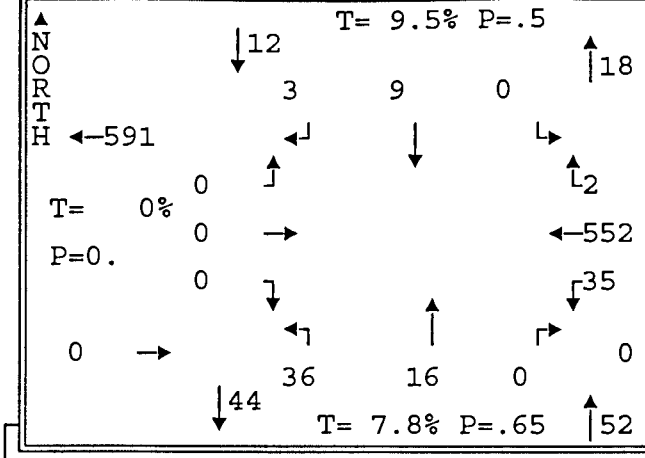
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
16:45-17:00	16	0	16	24	65	1	23	77	0	1	1	0	224
17:00-17:15	17	1	9	18	51	0	19	94	2	4	0	0	215
17:15-17:30	10	0	16	16	50	1	27	72	4	1	1	0	198
17:30-17:45	14	1	19	29	55	2	25	75	2	1	2	0	225
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:45-17:00	0	0	0	1	2	0	0	1	0	0	0	0	4
17:00-17:15	0	0	0	0	1	0	0	0	0	0	0	0	1
17:15-17:30	0	0	1	0	3	0	0	0	0	0	0	0	4
17:30-17:45	0	0	0	0	1	0	0	1	0	0	0	0	2
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:45-17:00	1	0	0	0	1	0	0	0	0	0	0	0	2
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:45-17:00	0	0	0	0	4	0	0	1	0	0	0	0	5
17:00-17:15	0	0	0	0	0	0	0	1	0	0	0	0	1
17:15-17:30	0	0	0	0	1	0	0	0	0	0	0	0	1
17:30-17:45	0	0	0	0	2	0	0	1	0	0	0	0	3
BICYCLES													
16:45-17:00	1	1	0	0	0	0	0	0	0	0	0	0	2
17:00-17:15	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
16:45-17:00	0	0	0	0	0
17:00-17:15	0	0	0	0	0
17:15-17:30	0	0	0	0	0
17:30-17:45	0	0	0	0	0

Peak Hour by Movement													
PHF	.84	.5	.79	.75	.85	.5	.87	.85	.5	.44	.5	0	.957
% Trucks(all)	1.8	0	1.7	1.1	6.8	0	0	1.6	0	0	0	0	2.7
% Trucks(M+H)	1.8	0	0	0	3.6	0	0	.9	0	0	0	0	1.4
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	41	3	62	95	252	2	76	293	9	6	3	0	842
16:15-17:15	47	2	54	92	240	1	78	305	9	7	3	0	838
16:30-17:30	51	2	57	88	225	2	84	315	11	8	2	0	845
16:45-17:45	57	2	60	87	221	4	94	318	8	7	4	0	862
17:00-18:00	58	3	52	84	212	3	105	310	9	8	3	2	849

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC AVENUE AT ELM STREET

17757



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

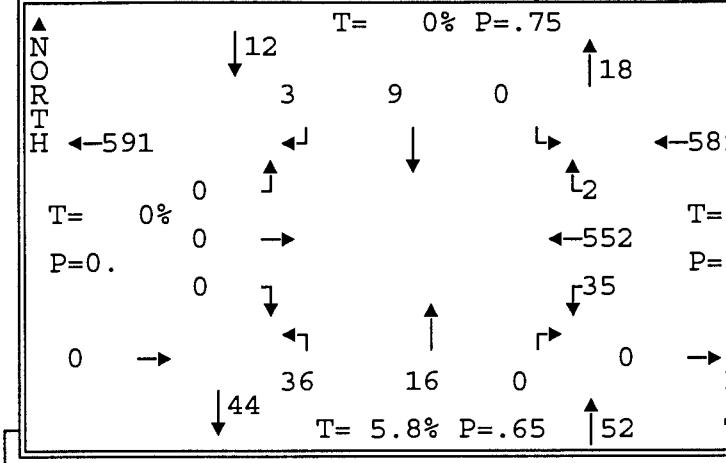
DCBI

Peak Hour
07:45-08:45
TEV=653

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	0	0	0	1	0	0	3	0	0	0	29	0	33
07:05-07:10	0	0	0	0	2	0	3	0	0	1	34	0	40
07:10-07:15	0	0	0	0	0	0	1	0	0	2	45	0	48
07:15-07:20	0	0	0	0	0	0	1	1	0	1	37	1	41
07:20-07:25	0	0	0	0	1	0	3	1	0	1	32	0	38
07:25-07:30	0	0	0	0	0	0	2	2	0	3	43	0	50
07:30-07:35	0	0	0	0	0	0	3	0	0	1	43	0	47
07:35-07:40	0	0	0	0	1	0	3	1	0	3	40	0	48
07:40-07:45	0	0	0	0	3	0	5	0	0	1	45	0	54
07:45-07:50	0	0	0	0	0	0	3	1	0	3	60	0	67
07:50-07:55	0	0	0	0	1	0	2	2	0	3	62	0	70
07:55-08:00	0	0	0	0	3	0	5	2	0	2	71	0	83
08:00-08:05	0	0	0	0	2	0	0	0	0	3	45	1	51
08:05-08:10	0	0	0	0	0	0	3	1	0	4	30	0	38
08:10-08:15	0	0	0	1	1	0	1	2	0	0	37	0	42
08:15-08:20	0	0	0	0	0	0	4	1	0	3	40	0	48
08:20-08:25	0	0	0	0	1	0	0	2	0	3	38	0	44
08:25-08:30	0	0	0	0	0	0	3	0	0	3	45	0	51
08:30-08:35	0	0	0	0	0	0	7	2	0	5	36	1	51
08:35-08:40	0	0	0	1	0	0	4	2	0	4	30	0	41
08:40-08:45	0	0	0	1	1	0	4	1	0	2	58	0	67
08:45-08:50	0	0	0	1	0	0	5	2	0	1	51	1	61
08:50-08:55	0	0	0	0	0	0	5	2	0	7	57	0	71
08:55-09:00	0	0	0	0	0	0	7	1	0	2	55	0	65
Total Survey	0	0	0	5	16	0	77	26	0	58	1063	4	1249
PHF	0	0	0	.38	.38	0	.6	.8	0	.73	.72	.5	.742
% Trucks	0	0	0	20	6.3	0	7.8	7.7	0	12.1	7.4	0	7.7
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	2	0	0	1	0	0	0	0	0	1	0	
Hourly Totals													
07:00-08:00	0	0	0	1	11	0	34	10	0	21	541	1	619
07:15-08:15	0	0	0	1	12	0	31	13	0	25	545	2	629
07:30-08:30	0	0	0	1	12	0	32	12	0	29	556	1	643
07:45-08:45	0	0	0	3	9	0	36	16	0	35	552	2	653
08:00-09:00	0	0	0	4	5	0	43	16	0	37	522	3	630

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC AVENUE AT ELM STREET



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

DCBI

Traffic Smithy
(503)641-6333

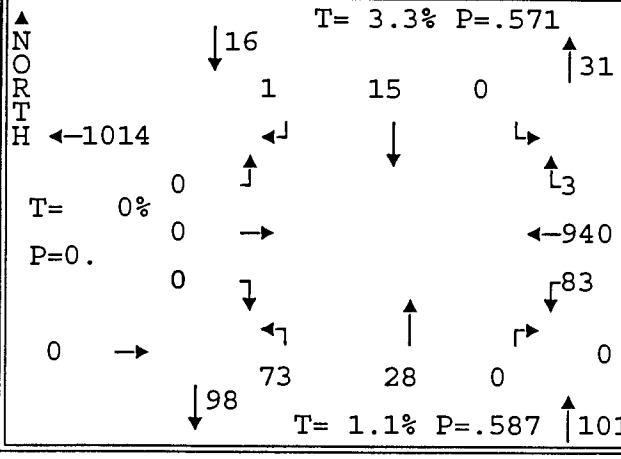
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:45-08:00	0	0	0	0	4	0	10	5	0	8	193	0	220
08:00-08:15	0	0	0	1	3	0	4	3	0	7	112	1	131
08:15-08:30	0	0	0	0	1	0	7	3	0	9	123	0	143
08:30-08:45	0	0	0	2	1	0	15	5	0	11	124	1	159
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:45-08:00	0	0	0	0	0	0	1	0	0	0	4	0	5
08:00-08:15	0	0	0	0	0	0	0	0	0	2	2	0	4
08:15-08:30	0	0	0	0	0	0	0	1	0	1	13	0	15
08:30-08:45	0	0	0	0	0	0	1	0	0	3	6	0	10
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:45-08:00	0	0	0	0	0	0	0	0	0	0	3	0	3
08:00-08:15	0	0	0	0	0	0	0	0	0	0	2	0	2
08:15-08:30	0	0	0	0	0	0	0	0	0	0	1	0	1
08:30-08:45	0	0	0	0	0	0	0	0	0	0	1	0	1
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:45-08:00	0	0	0	0	0	0	0	0	0	0	1	0	1
08:00-08:15	0	0	0	0	0	0	0	0	0	0	4	0	4
08:15-08:30	0	0	0	0	0	0	0	0	0	0	3	0	3
08:30-08:45	0	0	0	0	0	0	0	0	0	0	3	0	3
BICYCLES													
07:45-08:00	0	1	0	0	0	0	0	0	0	0	2	0	3
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30-08:45	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS ---CROSSWALK USEAGE---	SOUTH	WEST	EAST	NORTH	ALL
07:45-08:00	2	0	0	0	2
08:00-08:15	0	1	0	0	1
08:15-08:30	0	0	0	0	0
08:30-08:45	0	0	0	0	0

Peak Hour by Movement													
PHF	0	0	0	.38	.56	0	.6	.8	0	.8	.72	.5	.742
% Trucks(all)	0	0	0	0	0	0	5.6	6.3	0	17.1	7.8	0	8
% Trucks(M+H)	0	0	0	0	0	0	0	0	0	0	3.3	0	2.8
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	0	0	0	1	11	0	34	10	0	21	541	1	619
07:15-08:15	0	0	0	1	12	0	31	13	0	25	545	2	629
07:30-08:30	0	0	0	1	12	0	32	12	0	29	556	1	643
07:45-08:45	0	0	0	3	9	0	36	16	0	35	552	2	653
08:00-09:00	0	0	0	4	5	0	43	16	0	37	522	3	630

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC AVENUE AT ELM STREET

17711



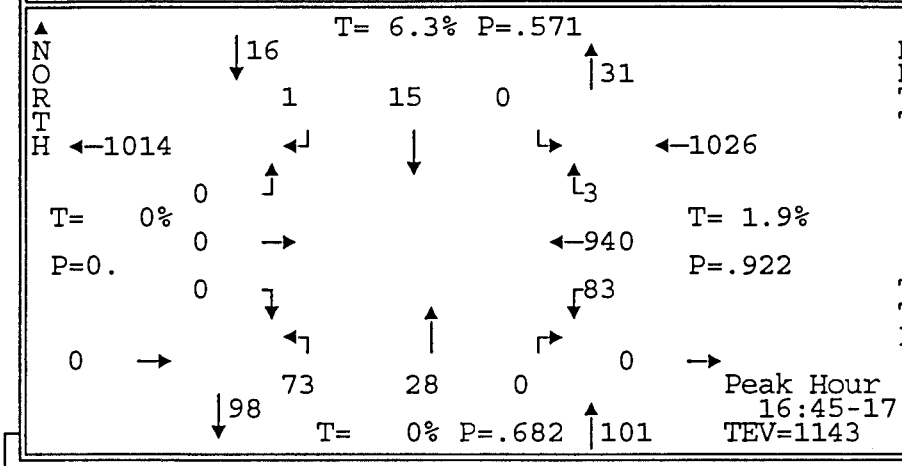
DATE OF COUNT: 10/22/98
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 18:00

jsbo

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	0	0	0	0	0	0	4	2	0	11	71	1	89
16:05-16:10	0	0	0	1	1	0	9	3	0	15	65	0	94
16:10-16:15	0	0	0	0	0	0	7	0	0	9	76	1	93
16:15-16:20	0	0	0	0	2	0	8	2	0	10	75	0	97
16:20-16:25	0	0	0	0	2	0	3	3	0	7	56	0	71
16:25-16:30	0	0	0	0	1	0	7	0	0	7	53	0	68
16:30-16:35	0	0	0	0	0	0	4	2	0	6	72	0	84
16:35-16:40	0	0	0	0	0	0	5	0	0	8	63	0	76
16:40-16:45	0	0	0	0	1	0	10	1	0	12	57	0	81
16:45-16:50	0	0	0	0	2	0	6	2	0	4	80	0	94
16:50-16:55	0	0	0	0	1	0	4	0	0	9	59	1	74
16:55-17:00	0	0	0	0	1	0	5	3	0	7	79	0	95
17:00-17:05	0	0	0	1	1	0	8	1	0	7	68	0	86
17:05-17:10	0	0	0	0	3	0	2	0	0	7	78	0	90
17:10-17:15	0	0	0	0	2	0	6	4	0	5	78	0	95
17:15-17:20	0	0	0	0	0	0	8	6	0	5	88	0	107
17:20-17:25	0	0	0	0	0	0	16	3	0	6	85	0	110
17:25-17:30	0	0	0	0	2	0	2	2	0	5	76	1	88
17:30-17:35	0	0	0	0	1	0	9	4	0	6	73	1	94
17:35-17:40	0	0	0	0	2	0	1	1	0	9	89	0	102
17:40-17:45	0	0	0	0	0	0	6	2	0	13	87	0	108
17:45-17:50	0	0	0	1	2	0	3	1	0	8	68	1	84
17:50-17:55	0	0	0	0	1	0	5	1	0	3	59	2	71
17:55-18:00	0	0	0	0	2	0	5	1	0	14	68	0	90
Total Survey	0	0	0	3	27	0	143	44	0	193	1723	8	2141
PHF	0	0	0	.25	.63	0	.61	.54	0	.74	.94	.38	.915
% Trucks	0	0	0	0	3.7	0	1.4	0	0	1.6	2.7	0	2.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	8	0	0	3	0	0	6	0	0	11	0	
Hourly Totals													
16:00-17:00	0	0	0	1	11	0	72	18	0	105	806	3	1016
16:15-17:15	0	0	0	1	16	0	68	18	0	89	818	1	1011
16:30-17:30	0	0	0	1	13	0	76	24	0	81	883	2	1080
16:45-17:45	0	0	0	1	15	0	73	28	0	83	940	3	1143
17:00-18:00	0	0	0	2	16	0	71	26	0	88	917	5	1125

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC AVENUE AT ELM STREET



DATE OF COUNT: 10/22/98
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

jsbo

Peak Hour
16:45-17:45
TEV=1143

Traffic Smithy
(503)641-6333

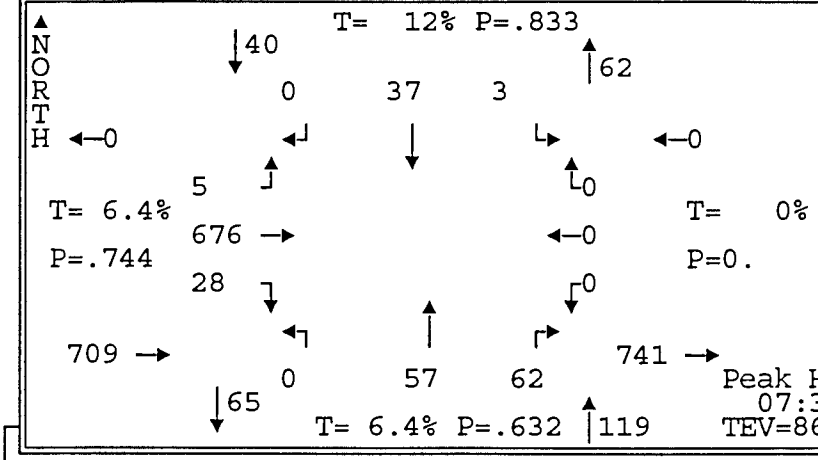
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
16:45-17:00	0	0	0	0	4	0	15	5	0	20	218	1	263
17:00-17:15	0	0	0	1	6	0	16	5	0	19	224	0	271
17:15-17:30	0	0	0	0	2	0	26	11	0	16	249	1	305
17:30-17:45	0	0	0	0	3	0	16	7	0	28	249	1	304
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:45-17:00	0	0	0	0	0	0	0	0	0	1	4	0	5
17:00-17:15	0	0	0	0	1	0	0	0	0	0	4	0	5
17:15-17:30	0	0	0	0	0	0	0	0	0	0	3	0	3
17:30-17:45	0	0	0	0	0	0	0	0	0	0	4	0	4
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	1	0	1
17:00-17:15	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	0	0	0	0	0	0	0	0	0	0	1	0	1
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	1	0	1
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0
BICYCLES													
16:45-17:00	0	2	0	0	0	0	0	2	0	0	1	0	5
17:00-17:15	0	0	0	0	1	0	0	0	0	0	0	0	1
17:15-17:30	0	0	0	0	0	0	0	0	0	1	2	0	3
17:30-17:45	0	1	0	0	0	0	0	0	0	0	0	0	1

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
16:45-17:00	0	0	1	3	4
17:00-17:15	0	0	0	0	0
17:15-17:30	1	0	0	0	1
17:30-17:45	0	3	0	2	5

Peak Hour by Movement													
PHF	0	0	0	.25	.63	0	.7	.64	0	.74	.94	.75	.936
% Trucks(all)	0	0	0	0	6.7	0	0	0	0	1.2	2	0	1.8
% Trucks(M+H)	0	0	0	0	0	0	0	0	0	0	.4	0	.3
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	0	0	0	1	11	0	72	18	0	105	806	3	1016
16:15-17:15	0	0	0	1	16	0	68	18	0	89	818	1	1011
16:30-17:30	0	0	0	1	13	0	76	24	0	81	883	2	1080
16:45-17:45	0	0	0	1	15	0	73	28	0	83	940	3	1143
17:00-18:00	0	0	0	2	16	0	71	26	0	88	917	5	1125

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
19TH AVENUE AT ELM STREET

17758



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

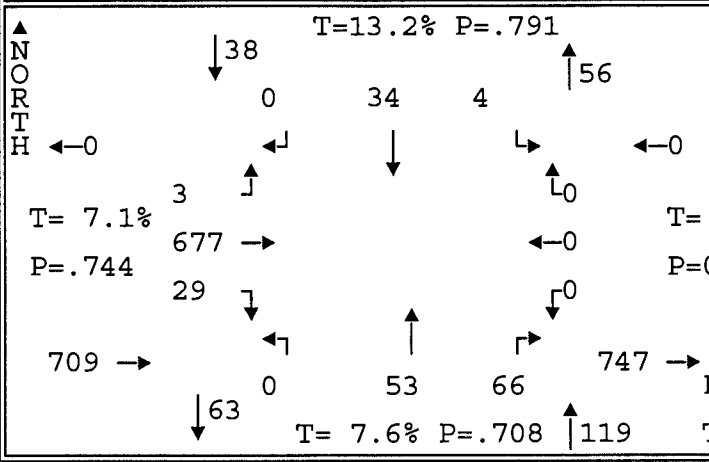
ELAX

Peak Hour
07:35-08:35
TEV=868

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	WEST BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	0	27	0	0	0	1	0	4	1	0	0	0	33
07:05-07:10	1	35	0	0	1	0	0	2	10	0	0	0	49
07:10-07:15	2	42	1	0	2	0	0	1	1	0	0	0	49
07:15-07:20	4	43	1	0	1	1	0	2	5	0	0	0	57
07:20-07:25	2	50	1	0	2	1	0	3	3	0	0	0	62
07:25-07:30	2	39	0	0	4	1	0	3	2	0	0	0	51
07:30-07:35	2	37	0	0	1	1	0	2	10	0	0	0	53
07:35-07:40	2	71	1	0	3	1	0	2	1	0	0	0	81
07:40-07:45	2	57	0	0	2	0	0	9	8	0	0	0	78
07:45-07:50	4	82	0	0	3	0	0	11	10	0	0	0	110
07:50-07:55	2	76	0	0	3	1	0	5	4	0	0	0	91
07:55-08:00	4	70	0	0	5	0	0	7	5	0	0	0	91
08:00-08:05	6	60	0	0	2	0	0	0	4	0	0	0	72
08:05-08:10	3	43	1	0	4	1	0	3	5	0	0	0	60
08:10-08:15	1	41	0	0	2	0	0	2	5	0	0	0	51
08:15-08:20	2	46	0	0	1	0	0	7	4	0	0	0	60
08:20-08:25	0	55	1	0	3	0	0	2	4	0	0	0	65
08:25-08:30	1	39	0	0	5	0	0	3	6	0	0	0	54
08:30-08:35	1	36	2	0	4	0	0	6	6	0	0	0	55
08:35-08:40	4	43	0	0	4	0	0	7	8	0	0	0	66
08:40-08:45	2	56	0	0	3	1	0	5	6	0	0	0	73
08:45-08:50	6	56	0	0	2	0	0	6	6	0	0	0	76
08:50-08:55	3	56	1	0	5	0	0	8	9	0	0	0	82
08:55-09:00	3	62	1	0	4	0	0	8	3	0	0	0	81
Total Survey	59	1222	10	0	66	9	0	108	126	0	0	0	1600
PHF	.54	.74	.42	0	.77	.75	0	.57	.7	0	0	0	.743
% Trucks	5.1	6.5	0	0	12.1	11.1	0	10.2	3.2	0	0	0	6.7
Stopped Buses	0	5	0	0	0	0	0	0	0	0	0	0	
Peds	0	1	0	0	2	0	0	0	0	0	2	0	
Hourly Totals													
07:00-08:00	27	629	4	0	27	7	0	51	60	0	0	0	805
07:15-08:15	34	669	4	0	32	7	0	49	62	0	0	0	857
07:30-08:30	29	677	3	0	34	4	0	53	66	0	0	0	866
07:45-08:45	30	647	4	0	39	3	0	58	67	0	0	0	848
08:00-09:00	32	593	6	0	39	2	0	57	66	0	0	0	795

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
19TH AVENUE AT ELM STREET



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ELAX

Peak Hour
07:30-08:30
TEV=866

Traffic Smithy
(503)641-6333

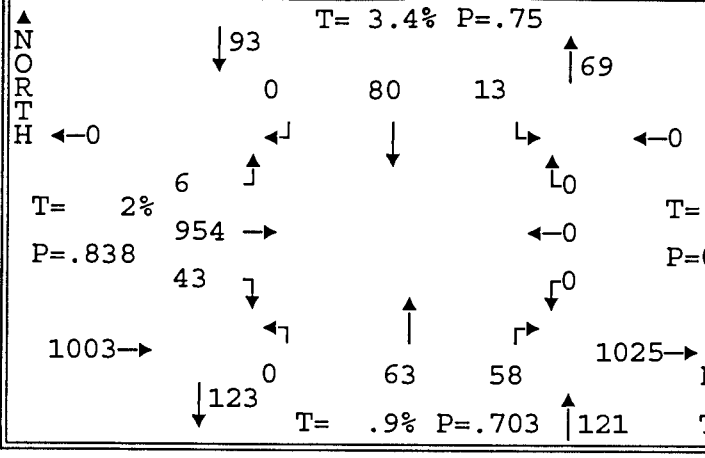
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↓	SOUTH BOUND ←	SOUTH BOUND ↑	NORTH BOUND ↓	NORTH BOUND →	NORTH BOUND ↑	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:30-07:45	6	165	1	0	6	2	0	13	19	0	0	0	212
07:45-08:00	10	228	0	0	11	1	0	23	19	0	0	0	292
08:00-08:15	10	144	1	0	8	1	0	5	14	0	0	0	183
08:15-08:30	3	140	1	0	9	0	0	12	14	0	0	0	179
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:30-07:45	1	11	0	0	0	1	0	3	1	0	0	0	17
07:45-08:00	0	15	0	0	0	0	0	1	0	0	0	0	16
08:00-08:15	0	3	0	0	2	0	0	0	0	0	0	0	5
08:15-08:30	0	4	0	0	1	0	0	3	1	0	0	0	9
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:30-07:45	0	2	0	0	0	0	0	0	0	0	0	0	2
07:45-08:00	0	4	0	0	0	0	0	0	0	0	0	0	4
08:00-08:15	0	4	0	0	0	0	0	0	0	0	0	0	4
08:15-08:30	0	4	0	0	1	0	0	0	0	0	0	0	5
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	1	0	0	0	0	0	0	0	0	0	0	1
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	0	1	0	0	0	0	0	0	0	0	0	0	1
BICYCLES													
07:30-07:45	0	0	0	0	1	0	0	0	0	0	0	0	1
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15-08:30	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
07:30-07:45	0	1	0	0	1
07:45-08:00	1	0	0	0	1
08:00-08:15	0	1	0	0	1
08:15-08:30	0	0	0	1	1

Peak Hour by Movement													
PHF	.73	.74	.75	0	.77	.5	0	.58	.87	0	0	0	.741
% Trucks(all)	3.4	7.2	0	0	11.8	25	0	13.2	3	0	0	0	7.4
% Trucks(M+H)	0	2.4	0	0	2.9	0	0	0	0	0	0	0	2
Stopped Buses	0	3	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	27	629	4	0	27	7	0	51	60	0	0	0	805
07:15-08:15	34	669	4	0	32	7	0	49	62	0	0	0	857
07:30-08:30	29	677	3	0	34	4	0	53	66	0	0	0	866
07:45-08:45	30	647	4	0	39	3	0	58	67	0	0	0	848
08:00-09:00	32	593	6	0	39	2	0	57	66	0	0	0	795

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
19TH AVENUE AT ELM STREET

17759



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

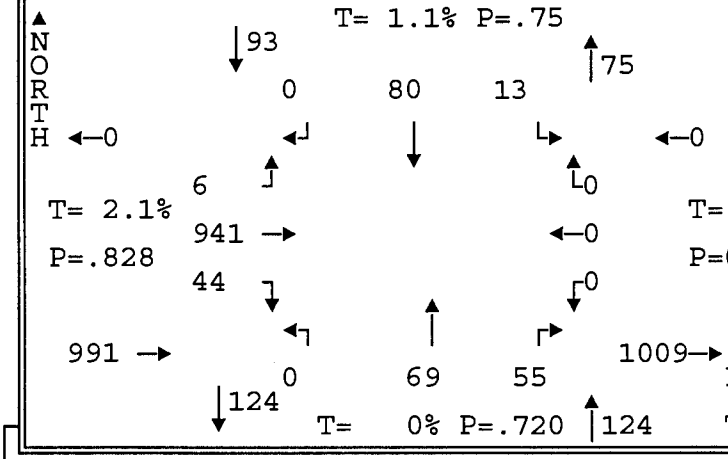
SSIT

Peak Hour
16:40-17:40
TEV=1217

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	2	51	1	0	9	0	0	8	1	0	0	0	72
16:05-16:10	6	58	0	0	5	1	0	6	5	0	0	0	81
16:10-16:15	6	73	0	0	11	1	0	6	2	0	0	0	99
16:15-16:20	3	78	0	0	4	0	0	3	3	0	0	0	91
16:20-16:25	2	20	1	0	1	0	0	2	0	0	0	0	26
16:25-16:30	6	72	1	0	6	0	0	8	7	0	0	0	100
16:30-16:35	1	58	2	0	4	1	0	5	3	0	0	0	74
16:35-16:40	6	76	0	0	9	0	0	6	3	0	0	0	100
16:40-16:45	7	87	2	0	6	1	0	5	4	0	0	0	112
16:45-16:50	2	69	1	0	11	0	0	6	6	0	0	0	95
16:50-16:55	3	78	0	0	5	3	0	4	8	0	0	0	101
16:55-17:00	1	62	0	0	10	2	0	13	6	0	0	0	94
17:00-17:05	2	86	0	0	2	0	0	5	2	0	0	0	97
17:05-17:10	2	98	0	0	9	0	0	6	3	0	0	0	118
17:10-17:15	7	104	0	0	8	2	0	3	1	0	0	0	125
17:15-17:20	4	77	0	0	7	0	0	6	6	0	0	0	100
17:20-17:25	7	71	1	0	1	2	0	5	5	0	0	0	92
17:25-17:30	2	75	0	0	8	2	0	5	8	0	0	0	100
17:30-17:35	2	62	1	0	7	0	0	0	3	0	0	0	75
17:35-17:40	4	85	1	0	6	1	0	5	6	0	0	0	108
17:40-17:45	2	65	3	0	8	2	0	5	6	0	0	0	91
17:45-17:50	1	65	2	0	6	0	0	5	6	0	0	0	85
17:50-17:55	4	52	0	0	8	0	0	4	6	0	0	0	74
17:55-18:00	3	63	0	0	4	2	0	3	6	0	0	0	81
Total Survey	85	1685	16	0	155	20	0	124	106	0	0	0	2191
PHF	.6	.83	.5	0	.77	.65	0	.66	.73	0	0	0	.887
% Trucks	8.2	1.7	6.3	0	3.9	0	0	1.6	0	0	0	0	2
Stopped Buses	0	4	0	0	0	0	0	0	0	0	0	0	
Peds	0	3	0	0	5	0	0	4	0	0	2	0	
Hourly Totals													
16:00-17:00	45	782	8	0	81	9	0	72	48	0	0	0	1045
16:15-17:15	42	888	7	0	75	9	0	66	46	0	0	0	1133
16:30-17:30	44	941	6	0	80	13	0	69	55	0	0	0	1208
16:45-17:45	38	932	7	0	82	14	0	63	60	0	0	0	1196
17:00-18:00	40	903	8	0	74	11	0	52	58	0	0	0	1146

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
19TH AVENUE AT ELM STREET



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

SSIT

Traffic Smithy
(503)641-6333

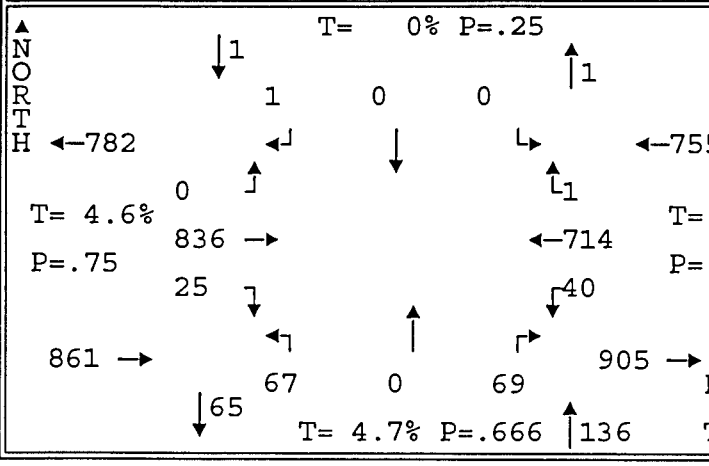
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↓	SOUTH BOUND ←	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
16:30-16:45	14	221	4	0	19	2	0	16	10	0	0	0	286
16:45-17:00	6	209	1	0	26	5	0	23	20	0	0	0	290
17:00-17:15	11	288	0	0	19	2	0	14	6	0	0	0	340
17:15-17:30	13	223	1	0	16	4	0	16	19	0	0	0	292
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:30-16:45	1	2	0	0	1	0	0	0	0	0	0	0	4
16:45-17:00	1	2	0	0	0	0	0	0	0	0	0	0	3
17:00-17:15	1	3	0	0	0	0	0	0	0	0	0	0	4
17:15-17:30	0	2	0	0	0	0	0	0	0	0	0	0	2
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:30-16:45	0	1	0	0	0	0	0	0	0	0	0	0	1
16:45-17:00	0	2	0	0	0	0	0	0	0	0	0	0	2
17:00-17:15	0	3	0	0	0	0	0	0	0	0	0	0	3
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:30-16:45	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	0	3	0	0	0	0	0	0	0	0	0	0	3
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
BICYCLES													
16:30-16:45	0	1	0	0	0	0	0	0	0	0	0	0	1
16:45-17:00	0	1	0	0	1	0	0	0	0	0	0	0	2
17:00-17:15	0	1	0	0	0	0	0	0	0	0	0	0	1
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
16:30-16:45	0	0	1	0	1
16:45-17:00	0	0	0	1	1
17:00-17:15	0	0	0	0	0
17:15-17:30	1	3	1	0	5

Peak Hour by Movement													
PHF	.79	.82	.38	0	.77	.65	0	.75	.69	0	0	0	.888
% Trucks(all)	6.8	1.9	0	0	1.3	0	0	0	0	0	0	0	1.8
% Trucks(M+H)	0	1	0	0	0	0	0	0	0	0	0	0	.7
Stopped Buses	0	1	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	45	782	8	0	81	9	0	72	48	0	0	0	1045
16:15-17:15	42	888	7	0	75	9	0	66	46	0	0	0	1133
16:30-17:30	44	941	6	0	80	13	0	69	55	0	0	0	1208
16:45-17:45	38	932	7	0	82	14	0	63	60	0	0	0	1196
17:00-18:00	40	903	8	0	74	11	0	52	58	0	0	0	1146

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC AVENUE AT MAPLE STREET

17832



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

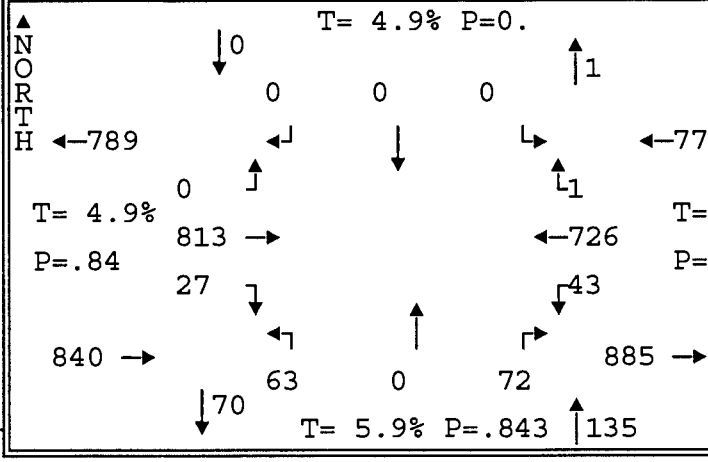
BKKN

Peak Hour
07:20-08:20
TEV=1753

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↙	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	1	56	0	0	0	0	1	0	9	5	47	0	119
07:05-07:10	2	57	0	0	0	0	7	0	9	2	37	0	114
07:10-07:15	2	56	0	0	0	0	4	0	12	2	44	0	120
07:15-07:20	4	44	0	0	0	0	2	0	6	4	60	0	120
07:20-07:25	4	52	0	0	0	0	2	0	4	4	48	0	114
07:25-07:30	2	71	0	0	0	0	11	0	7	3	43	0	137
07:30-07:35	2	59	0	0	0	0	9	0	4	3	65	0	142
07:35-07:40	4	79	0	0	0	0	5	0	4	5	68	0	165
07:40-07:45	3	97	0	0	0	0	10	0	8	1	53	0	172
07:45-07:50	3	93	0	0	0	0	5	0	12	3	79	0	195
07:50-07:55	0	91	0	0	0	0	8	0	8	1	77	0	185
07:55-08:00	2	61	0	0	0	0	3	0	3	6	76	0	151
08:00-08:05	1	58	0	0	0	0	3	0	8	5	52	0	127
08:05-08:10	1	53	0	0	0	0	4	0	6	4	53	0	121
08:10-08:15	1	55	0	0	0	0	1	0	2	4	52	1	116
08:15-08:20	2	67	0	1	0	0	6	0	3	1	48	0	128
08:20-08:25	2	42	0	0	0	0	4	0	3	2	41	1	95
08:25-08:30	5	50	0	0	0	0	8	0	5	2	50	0	120
08:30-08:35	3	43	0	0	0	0	3	0	4	5	55	1	114
08:35-08:40	1	49	0	1	0	0	3	0	14	10	52	0	130
08:40-08:45	2	62	0	0	0	0	10	0	3	6	55	1	139
08:45-08:50	2	59	0	0	0	0	7	0	7	10	64	0	149
08:50-08:55	3	63	0	0	0	0	11	0	11	13	89	0	190
08:55-09:00	7	50	0	0	0	0	14	0	8	12	70	0	161
Total Survey	59	1467	0	2	0	0	141	0	160	113	1378	4	3324
PHF	.63	.74	0	.25	0	0	.67	0	.62	.67	.77	.25	.793
% Trucks	0	4.8	0	0	0	0	2.8	0	6.3	4.4	6.9	0	5.5
Stopped Buses	0	5	0	0	0	0	0	0	0	0	3	0	
Peds	0	5	0	0	1	0	0	5	0	0	6	0	
Hourly Totals													
07:00-08:00	29	816	0	0	0	0	67	0	86	39	697	0	1734
07:15-08:15	27	813	0	0	0	0	63	0	72	43	726	1	1745
07:30-08:30	26	805	0	1	0	0	66	0	66	37	714	2	1717
07:45-08:45	23	724	0	2	0	0	58	0	71	49	690	4	1621
08:00-09:00	30	651	0	2	0	0	74	0	74	74	681	4	1590

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC AVENUE AT MAPLE STREET



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

BKKN

Peak Hour
07:15-08:15
TEV=1745

Traffic Smithy
(503)641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:15-07:30	10	167	0	0	0	0	15	0	17	11	151	0	371
07:30-07:45	9	235	0	0	0	0	24	0	16	9	186	0	479
07:45-08:00	5	245	0	0	0	0	16	0	23	10	232	0	531
08:00-08:15	3	166	0	0	0	0	8	0	16	13	157	1	364
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:15-07:30	0	6	0	0	0	0	1	0	0	0	8	0	15
07:30-07:45	0	12	0	0	0	0	0	0	2	1	10	0	25
07:45-08:00	0	10	0	0	0	0	2	0	1	0	6	0	19
08:00-08:15	0	6	0	0	0	0	0	0	1	0	10	0	17
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:15-07:30	0	0	0	0	0	0	0	0	1	2	1	0	4
07:30-07:45	0	1	0	0	0	0	0	0	0	0	4	0	5
07:45-08:00	0	3	0	0	0	0	0	0	0	0	0	0	3
08:00-08:15	0	0	0	0	0	0	0	0	0	0	2	0	2
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:15-07:30	0	1	0	0	0	0	0	0	0	0	0	0	1
07:30-07:45	0	0	0	0	0	0	0	0	0	0	1	0	1
07:45-08:00	0	2	0	0	0	0	0	0	0	0	0	0	2
08:00-08:15	0	0	0	0	0	0	0	0	0	0	1	0	1
BICYCLES													
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0

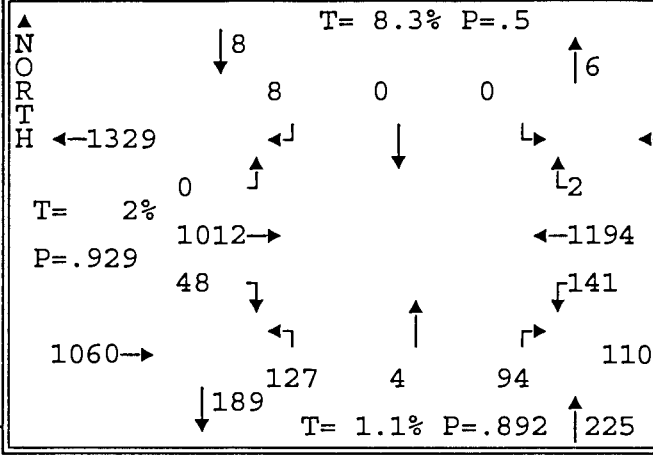
PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
07:15-07:30	1	1	1	1	4
07:30-07:45	1	0	0	3	4
07:45-08:00	0	0	2	1	3
08:00-08:15	0	0	0	0	0

Peak Hour by Movement													
PHF	.68	.83	0	0	0	0	.66	0	.78	.83	.78	.25	.821
% Trucks(all)	0	5	0	0	0	0	4.8	0	6.9	7	5.9	0	5.4
% Trucks(M+H)	0	.9	0	0	0	0	0	0	1.4	4.7	1.2	0	1.1
Stopped Buses	0	2	0	0	0	0	0	0	0	0	2	0	

Hourly Totals													
07:00-08:00	29	816	0	0	0	0	67	0	86	39	697	0	1734
07:15-08:15	27	813	0	0	0	0	63	0	72	43	726	1	1745
07:30-08:30	26	805	0	1	0	0	66	0	66	37	714	2	1717
07:45-08:45	23	724	0	2	0	0	58	0	71	49	690	4	1621
08:00-09:00	30	651	0	2	0	0	74	0	74	74	681	4	1590

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
PACIFIC AVENUE AT MAPLE STREET

17833



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

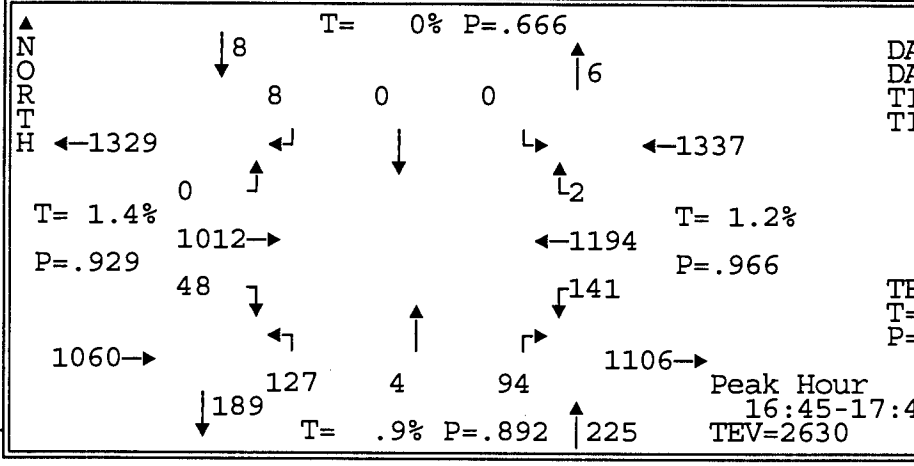
BKKO

Peak Hour
16:45-17:45
TEV=2630

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	4	75	0	1	0	0	6	0	13	14	96	0	209
16:05-16:10	2	101	0	0	0	0	13	0	11	12	98	0	237
16:10-16:15	4	96	0	0	0	0	7	0	11	10	80	0	208
16:15-16:20	4	92	0	0	0	0	10	0	8	14	104	0	232
16:20-16:25	5	65	0	0	0	0	14	0	10	17	85	0	196
16:25-16:30	5	95	0	0	0	0	10	0	6	12	104	0	232
16:30-16:35	3	76	0	0	0	0	14	0	14	12	96	0	215
16:35-16:40	4	86	0	2	0	0	7	0	16	6	101	0	222
16:40-16:45	2	82	0	0	0	0	11	0	10	10	83	1	199
16:45-16:50	2	94	0	0	0	0	12	0	8	10	104	1	231
16:50-16:55	3	64	0	1	0	0	13	0	3	12	98	0	194
16:55-17:00	5	80	0	1	0	0	14	0	8	9	94	0	211
17:00-17:05	1	72	0	2	0	0	8	2	6	12	96	1	200
17:05-17:10	6	108	0	1	0	0	12	1	4	12	78	0	222
17:10-17:15	3	80	0	0	0	0	5	0	14	17	114	0	233
17:15-17:20	6	80	0	1	0	0	12	1	10	9	94	0	213
17:20-17:25	9	81	0	0	0	0	6	0	10	12	129	0	247
17:25-17:30	7	74	0	1	0	0	17	0	7	15	87	0	208
17:30-17:35	1	89	0	1	0	0	10	0	6	8	105	0	220
17:35-17:40	4	106	0	0	0	0	10	0	8	12	108	0	248
17:40-17:45	1	84	0	0	0	0	8	0	10	13	87	0	203
17:45-17:50	5	79	0	1	0	0	14	0	3	9	101	0	212
17:50-17:55	8	68	0	0	0	0	10	0	8	7	87	0	188
17:55-18:00	5	76	0	0	0	0	5	0	9	8	103	0	206
Total Survey	99	2003	0	12	0	0	248	4	213	272	2332	3	5186
PHF	.55	.91	0	.5	0	0	.81	.33	.69	.86	.89	.5	.948
% Trucks	2	2	0	8.3	0	0	1.6	0	.5	1.8	1.4	0	1.7
Stopped Buses	0	4	1	0	0	0	0	0	0	0	4	0	
Peds	0	7	0	0	0	0	0	14	0	0	3	0	
Hourly Totals													
16:00-17:00	43	1006	0	5	0	0	131	0	118	138	1143	2	2586
16:15-17:15	43	994	0	7	0	0	130	3	107	143	1157	3	2587
16:30-17:30	51	977	0	9	0	0	131	4	110	136	1174	3	2595
16:45-17:45	48	1012	0	8	0	0	127	4	94	141	1194	2	2630
17:00-18:00	56	997	0	7	0	0	117	4	95	134	1189	1	2600

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
PACIFIC AVENUE AT MAPLE STREET



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

BKKO

Peak Hour
16:45-17:45
TEV=2630

Traffic Smithy
(503)641-6333

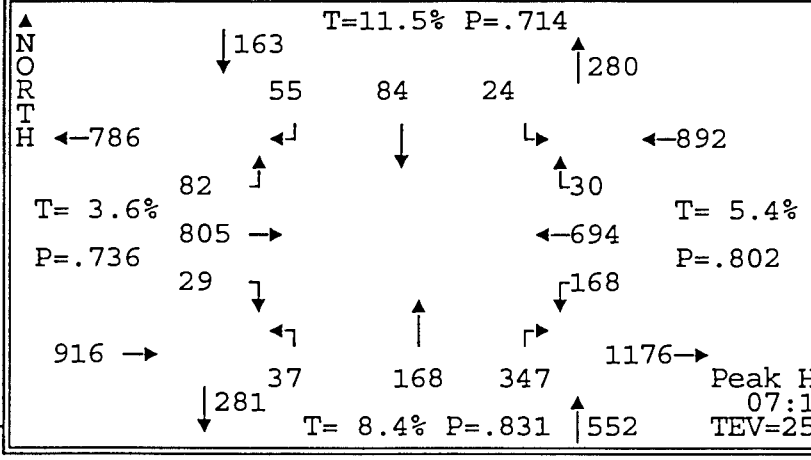
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
16:45-17:00	10	238	0	2	0	0	39	0	19	31	296	1	636
17:00-17:15	10	260	0	3	0	0	25	3	24	41	288	1	655
17:15-17:30	22	235	0	2	0	0	35	1	27	36	310	0	668
17:30-17:45	6	279	0	1	0	0	28	0	24	33	300	0	671
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:45-17:00	0	4	0	0	0	0	0	0	0	0	4	0	8
17:00-17:15	0	5	0	0	0	0	1	0	1	0	4	0	11
17:15-17:30	0	2	0	0	0	0	0	0	0	0	3	0	5
17:30-17:45	0	3	0	0	0	0	0	0	0	1	1	0	5
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	1	0	0	0	0	0	0	0	0	1	0	2
17:15-17:30	0	0	0	0	0	0	0	0	0	1	1	0	2
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0
BICYCLES													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15-17:30	0	0	0	0	0	0	0	0	0	0	1	0	1
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
16:45-17:00	1	0	0	0	1
17:00-17:15	2	0	2	2	6
17:15-17:30	0	0	2	0	2
17:30-17:45	2	0	2	0	4

Peak Hour by Movement													
PHF	.55	.91	0	.67	0	0	.81	.33	.87	.86	.96	.5	.979
% Trucks(all)	0	1.5	0	0	0	0	.8	0	1.1	1.4	1.2	0	1.3
% Trucks(M+H)	0	.1	0	0	0	0	0	0	0	.7	.2	0	.2
Stopped Buses	0	2	1	0	0	0	0	0	0	0	2	0	
Hourly Totals													
16:00-17:00	43	1006	0	5	0	0	131	0	118	138	1143	2	2586
16:15-17:15	43	994	0	7	0	0	130	3	107	143	1157	3	2587
16:30-17:30	51	977	0	9	0	0	131	4	110	136	1174	3	2595
16:45-17:45	48	1012	0	8	0	0	127	4	94	141	1194	2	2630
17:00-18:00	56	997	0	7	0	0	117	4	95	134	1189	1	2600

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
HIGHWAY 47 AT PACIFIC AVENUE

17834



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

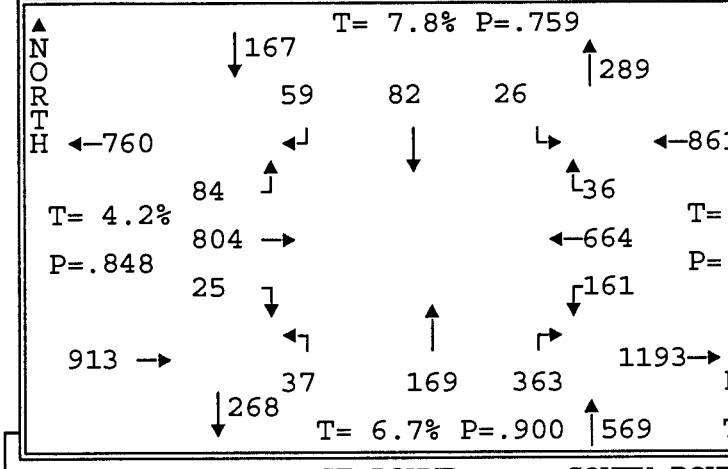
ERQR

Peak Hour
07:10-08:10
TEV=2523

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	1	60	6	5	8	3	2	14	28	16	44	4	191
07:05-07:10	1	57	10	5	5	2	2	9	32	8	35	6	172
07:10-07:15	3	64	9	5	3	2	1	19	21	11	57	3	198
07:15-07:20	1	47	2	2	11	2	6	15	34	16	42	2	180
07:20-07:25	3	36	6	4	6	2	5	10	27	24	50	3	176
07:25-07:30	3	82	4	4	4	2	2	14	27	8	42	6	198
07:30-07:35	1	55	11	2	8	1	5	16	28	12	59	1	199
07:35-07:40	0	66	7	6	6	1	3	15	22	8	58	1	193
07:40-07:45	3	100	6	5	7	1	3	18	33	10	56	1	243
07:45-07:50	3	99	8	5	8	3	3	16	42	16	76	3	282
07:50-07:55	3	81	8	5	11	2	5	14	32	24	78	4	267
07:55-08:00	3	57	7	11	5	5	0	9	37	8	67	2	211
08:00-08:05	1	59	8	4	12	2	4	14	26	17	43	2	192
08:05-08:10	5	59	6	2	3	1	0	8	18	14	66	2	184
08:10-08:15	3	48	3	9	8	6	2	17	26	12	42	0	176
08:15-08:20	2	66	4	5	7	6	4	10	24	8	46	1	183
08:20-08:25	2	47	8	7	3	4	2	11	32	13	32	3	164
08:25-08:30	1	51	4	5	6	2	2	7	25	10	43	1	157
08:30-08:35	0	37	0	4	9	2	6	5	22	13	56	1	155
08:35-08:40	4	56	3	4	11	4	0	6	16	20	62	2	188
08:40-08:45	1	46	3	6	4	1	2	9	14	14	65	4	169
08:45-08:50	4	76	2	7	5	7	6	8	21	20	72	2	230
08:50-08:55	0	76	4	5	4	5	2	6	17	14	77	0	210
08:55-09:00	1	51	2	11	4	3	4	6	25	13	70	0	190
Total Survey	49	1476	131	128	158	69	71	276	629	329	1338	54	4708
PHF	.81	.72	.85	.65	.75	.6	.71	.86	.78	.82	.79	.68	.796
% Trucks	6.1	3.7	2.3	3.9	20.3	5.8	8.5	13.4	6.2	9.4	4.5	3.7	5.9
Stopped Buses	0	0	0	0	0	0	0	0	0	0	2	0	
Peds	0	0	0	0	1	0	0	0	0	0	9	0	
Hourly Totals													
07:00-08:00	25	804	84	59	82	26	37	169	363	161	664	36	2510
07:15-08:15	29	789	76	59	89	28	38	166	352	169	679	27	2501
07:30-08:30	27	788	80	66	84	34	33	155	345	152	666	21	2451
07:45-08:45	28	706	62	67	87	38	30	126	314	169	676	25	2328
08:00-09:00	24	672	47	69	76	43	34	107	266	168	674	18	2198

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
HIGHWAY 47 AT PACIFIC AVENUE



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ERQR

Peak Hour
07:00-08:00
TEV=2510

Traffic Smithy
(503)641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:00-07:15	5	181	25	15	16	7	5	42	81	35	136	13	561
07:15-07:30	7	165	12	10	21	6	13	39	88	48	134	11	554
07:30-07:45	4	221	24	13	21	3	11	49	83	30	173	3	635
07:45-08:00	9	237	23	21	24	10	8	39	111	48	221	9	760
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:00-07:15	1	5	0	0	1	1	0	0	6	2	2	0	18
07:15-07:30	0	1	0	0	0	0	0	1	5	1	8	0	16
07:30-07:45	1	11	0	0	0	0	0	0	5	1	5	0	23
07:45-08:00	0	9	1	0	1	0	0	0	1	2	3	1	18
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:00-07:15	0	1	0	0	0	0	0	1	0	0	2	0	4
07:15-07:30	0	0	0	0	1	0	1	0	1	0	0	0	3
07:30-07:45	0	1	0	0	3	0	1	1	0	0	4	0	10
07:45-08:00	0	5	0	0	2	0	0	3	0	2	0	0	12
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:00-07:15	0	0	0	0	0	0	0	4	0	0	0	0	4
07:15-07:30	0	0	0	0	2	0	0	1	0	2	0	0	5
07:30-07:45	0	0	0	0	1	0	0	2	0	1	0	0	4
07:45-08:00	0	2	0	0	1	0	0	2	3	0	0	0	8
BICYCLES													
07:00-07:15	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	0	0	0	0	0	0	0	0	1	0	1	0	2
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0

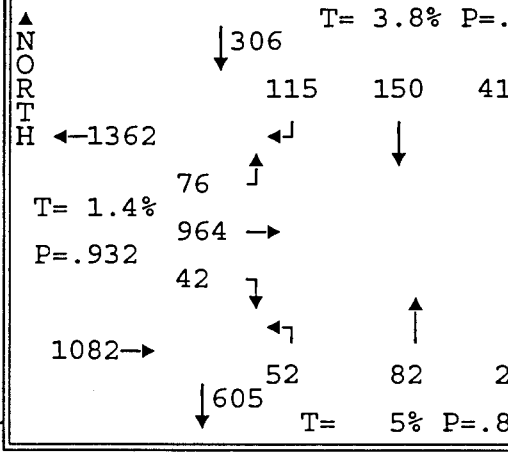
PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
07:00-07:15	0	0	0	1	1
07:15-07:30	0	0	0	1	1
07:30-07:45	0	0	0	2	2
07:45-08:00	0	0	0	1	1

Peak Hour by Movement													
PHF	.69	.85	.84	.7	.85	.65	.71	.86	.82	.84	.75	.69	.825
% Trucks(all)	8	4.4	1.2	0	14.6	3.8	5.4	8.9	5.8	6.8	3.6	2.8	5
% Trucks(M+H)	0	1.1	0	0	12.2	0	5.4	8.3	1.1	3.1	.9	0	2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	1	0	

Hourly Totals													
07:00-08:00	25	804	84	59	82	26	37	169	363	161	664	36	2510
07:15-08:15	29	789	76	59	89	28	38	166	352	169	679	27	2501
07:30-08:30	27	788	80	66	84	34	33	155	345	152	666	21	2451
07:45-08:45	28	706	62	67	87	38	30	126	314	169	676	25	2328
08:00-09:00	24	672	47	69	76	43	34	107	266	168	674	18	2198

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
HIGHWAY 47 AT PACIFIC AVENUE

17835



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

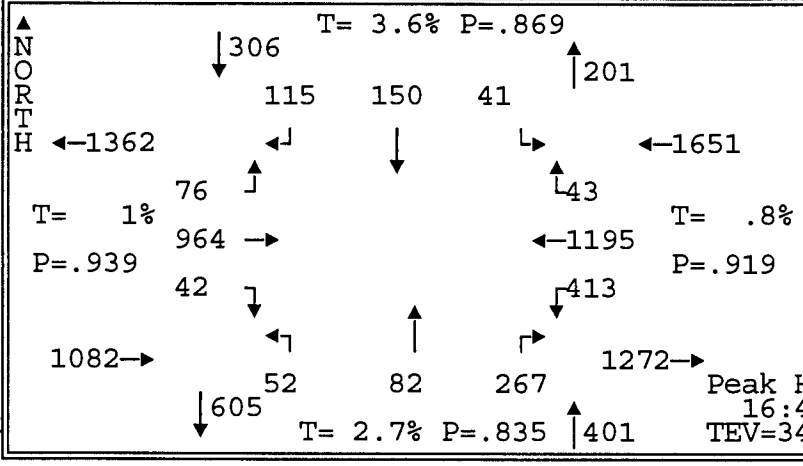
ERQS

Peak Hour
16:45-17:45
TEV=3440

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	2	76	8	13	12	7	5	6	19	26	83	4	261
16:05-16:10	4	101	4	17	9	2	3	7	16	27	104	3	297
16:10-16:15	2	81	10	12	9	6	3	6	24	38	77	5	273
16:15-16:20	2	111	4	17	15	3	1	3	35	15	102	5	313
16:20-16:25	1	76	12	5	15	9	3	7	24	23	88	7	270
16:25-16:30	4	67	5	9	10	9	1	8	20	29	100	5	267
16:30-16:35	3	84	5	9	12	4	4	4	19	24	91	3	262
16:35-16:40	0	91	3	14	14	9	4	18	28	33	87	2	303
16:40-16:45	4	73	5	11	9	4	9	10	36	25	65	8	259
16:45-16:50	2	82	6	11	12	6	10	7	39	38	86	3	302
16:50-16:55	4	62	6	15	14	2	1	11	22	38	108	4	287
16:55-17:00	8	80	6	7	9	5	3	4	23	33	105	2	285
17:00-17:05	4	77	6	12	6	3	3	8	26	24	93	2	264
17:05-17:10	3	94	12	4	7	4	4	6	12	30	91	5	272
17:10-17:15	4	62	5	8	24	6	7	6	14	34	107	4	281
17:15-17:20	2	87	10	5	7	0	5	5	21	42	122	7	313
17:20-17:25	2	83	6	10	16	2	3	9	23	39	102	4	299
17:25-17:30	5	88	5	10	11	2	2	4	20	33	95	5	280
17:30-17:35	5	57	3	15	14	5	3	9	20	45	85	0	261
17:35-17:40	1	101	6	5	15	2	5	8	26	18	106	3	296
17:40-17:45	2	91	5	13	15	4	6	5	21	39	95	4	300
17:45-17:50	0	57	7	14	21	5	3	9	12	35	83	7	253
17:50-17:55	3	64	6	7	12	2	3	10	18	31	96	6	258
17:55-18:00	2	70	5	9	9	3	2	6	12	24	88	7	237
Total Survey	69	1915	150	252	297	104	93	176	530	743	2259	105	6693
PHF	.66	.93	.7	.82	.8	.79	.81	.89	.79	.88	.9	.67	.963
% Trucks	7.2	1	2.7	2.8	5.4	1.9	2.2	8.5	4.3	2.3	.8	2.9	2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	3	0	
Peds	0	0	0	0	4	0	0	0	0	0	7	0	
Hourly Totals													
16:00-17:00	36	984	74	140	140	66	47	91	305	349	1096	51	3379
16:15-17:15	39	959	75	122	147	64	50	92	298	346	1123	50	3365
16:30-17:30	41	963	75	116	141	47	55	92	283	393	1152	49	3407
16:45-17:45	42	964	76	115	150	41	52	82	267	413	1195	43	3440
17:00-18:00	33	931	76	112	157	38	46	85	225	394	1163	54	3314

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
HIGHWAY 47 AT PACIFIC AVENUE



DATE OF COUNT: 11/04/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ERQS

Peak Hour
16:45-17:45
TEV=3440

Traffic Smithy
(503)641-6333

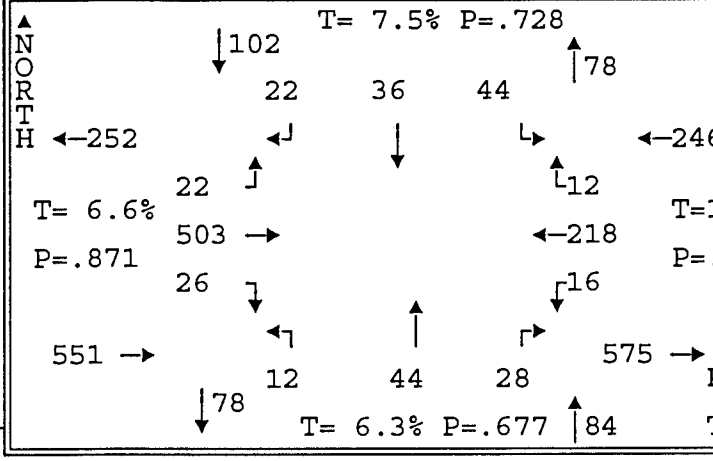
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
16:45-17:00	14	224	18	33	35	13	14	22	84	109	299	9	874
17:00-17:15	11	233	23	24	37	13	14	20	52	88	291	11	817
17:15-17:30	9	258	21	25	34	4	10	18	64	114	319	16	892
17:30-17:45	8	249	14	33	44	11	14	22	67	102	286	7	857
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:45-17:00	0	1	0	0	1	0	0	0	0	2	1	0	5
17:00-17:15	0	2	0	0	1	1	0	2	1	4	2	0	13
17:15-17:30	0	3	0	0	1	0	0	0	0	1	1	0	6
17:30-17:45	0	1	0	0	0	0	0	0	3	1	1	0	6
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:45-17:00	1	0	1	0	1	0	0	0	1	0	0	0	4
17:00-17:15	1	0	0	0	0	1	0	1	0	0	0	0	3
17:15-17:30	0	0	0	0	1	0	0	0	1	0	1	0	3
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:45-17:00	0	0	0	1	0	0	0	0	0	0	0	0	1
17:00-17:15	0	0	0	0	0	0	0	1	1	0	0	0	2
17:15-17:30	0	0	1	1	1	0	0	0	0	0	0	0	3
17:30-17:45	0	0	0	0	1	0	0	0	0	0	0	0	1
BICYCLES													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15-17:30	0	1	0	0	0	0	0	0	0	0	0	0	1
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
16:45-17:00	0	1	0	1	2
17:00-17:15	0	2	0	2	4
17:15-17:30	0	0	0	0	0
17:30-17:45	0	0	0	1	1

Peak Hour by Movement													
PHF	.75	.93	.83	.87	.85	.79	.93	.93	.79	.91	.94	.67	.964
% Trucks(all)	4.8	.7	2.6	1.7	4.7	4.9	0	4.9	2.6	1.9	.5	0	1.4
% Trucks(M+H)	4.8	0	2.6	1.7	2.7	2.4	0	2.4	1.1	0	.1	0	.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	1	0	
Hourly Totals													
16:00-17:00	36	984	74	140	140	66	47	91	305	349	1096	51	3379
16:15-17:15	39	959	75	122	147	64	50	92	298	346	1123	50	3365
16:30-17:30	41	963	75	116	141	47	55	92	283	393	1152	49	3407
16:45-17:45	42	964	76	115	150	41	52	82	267	413	1195	43	3440
17:00-18:00	33	931	76	112	157	38	46	85	225	394	1163	54	3314

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
HIGHWAY 47 AT MAPLE STREET

17854



DATE OF COUNT: 11/05/98
DAY OF WEEK: Thu
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

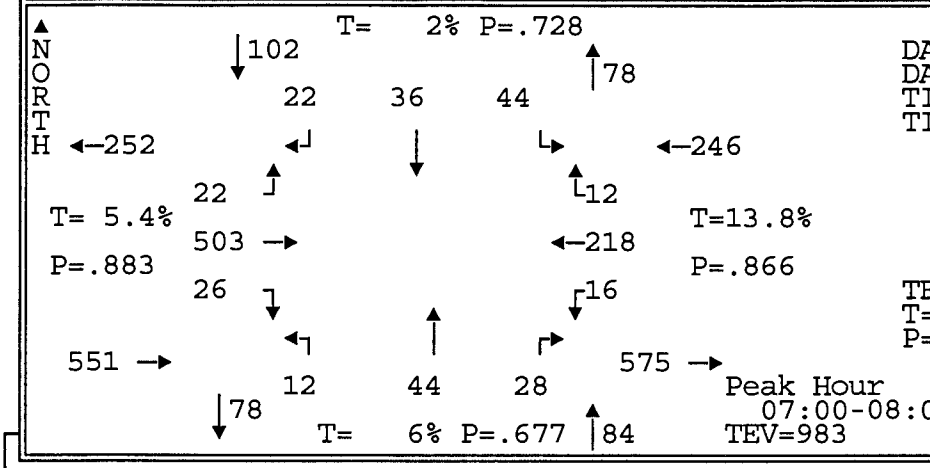
BKKP

Peak Hour
07:00-08:00
TEV=983

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	3	39	1	2	1	4	2	2	0	1	20	0	75
07:05-07:10	0	36	2	2	1	3	0	2	0	1	22	1	70
07:10-07:15	1	43	0	4	2	5	1	3	3	1	12	2	77
07:15-07:20	0	38	2	1	1	4	1	4	5	1	19	2	78
07:20-07:25	6	39	3	2	7	0	1	4	1	0	11	0	74
07:25-07:30	2	52	0	2	3	2	0	2	1	1	17	2	84
07:30-07:35	0	47	5	1	3	3	1	2	1	3	15	0	81
07:35-07:40	4	48	0	1	1	2	1	5	3	0	21	1	87
07:40-07:45	2	48	2	2	4	4	1	4	3	1	20	1	92
07:45-07:50	2	31	2	0	5	5	1	6	2	3	18	2	77
07:50-07:55	3	53	1	3	3	8	1	5	5	2	24	0	108
07:55-08:00	3	29	4	2	5	4	2	5	4	2	19	1	80
08:00-08:05	4	34	2	1	3	1	3	5	4	3	10	1	71
08:05-08:10	6	35	0	1	5	0	1	1	0	1	7	3	60
08:10-08:15	0	41	2	1	0	1	2	1	3	2	15	0	68
08:15-08:20	2	28	2	4	1	3	1	3	2	1	17	1	65
08:20-08:25	1	33	3	1	7	1	1	2	2	2	16	2	71
08:25-08:30	0	36	1	2	0	2	0	2	3	3	9	5	63
08:30-08:35	1	33	1	2	0	2	0	2	1	1	13	2	58
08:35-08:40	1	22	2	4	1	1	1	3	3	1	15	2	56
08:40-08:45	2	20	1	2	5	2	1	2	1	0	18	4	58
08:45-08:50	1	28	4	8	3	3	3	4	3	2	20	0	79
08:50-08:55	1	28	1	2	1	0	1	3	3	1	23	1	65
08:55-09:00	2	27	3	1	0	0	1	4	3	5	11	3	60
Total Survey	47	868	44	51	62	60	27	76	56	38	392	36	1757
PHF	.81	.86	.69	.69	.69	.65	.75	.69	.64	.57	.88	.6	.887
% Trucks	2.1	7	2.3	13.7	8.1	1.7	7.4	7.9	3.6	7.9	15.1	8.3	8.6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	1	0	0	0	0	0	1	0	
Hourly Totals													
07:00-08:00	26	503	22	22	36	44	12	44	28	16	218	12	983
07:15-08:15	32	495	23	17	40	34	15	44	32	19	196	13	960
07:30-08:30	27	463	24	19	37	34	15	41	32	23	191	17	923
07:45-08:45	25	395	21	23	35	30	14	37	30	21	181	23	835
08:00-09:00	21	365	22	29	26	16	15	32	28	22	174	24	774

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
HIGHWAY 47 AT MAPLE STREET



DATE OF COUNT: 11/05/98
DAY OF WEEK: Thu
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

BKKP

Peak Hour
07:00-08:00
TEV=983

Traffic Smithy
(503)641-6333

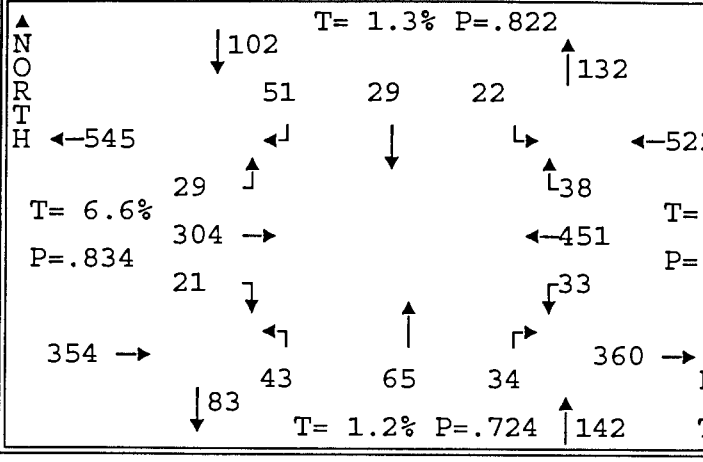
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:00-07:15	4	118	3	8	4	12	3	7	3	3	54	3	222
07:15-07:30	8	129	5	5	11	6	2	10	7	2	47	4	236
07:30-07:45	6	143	7	4	8	9	3	11	7	4	56	2	260
07:45-08:00	8	113	7	5	13	17	4	16	11	7	61	3	265
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:00-07:15	0	8	0	0	0	1	0	1	0	0	1	1	12
07:15-07:30	0	5	0	0	0	0	0	0	1	0	0	0	6
07:30-07:45	0	7	1	0	0	0	0	0	0	1	3	0	12
07:45-08:00	0	2	0	0	0	0	1	0	0	1	7	0	11
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:00-07:15	0	1	0	0	0	0	0	0	0	0	0	0	1
07:15-07:30	0	0	0	0	0	0	0	1	0	0	0	0	1
07:30-07:45	0	1	0	0	1	0	1	0	0	0	1	0	4
07:45-08:00	0	0	0	0	0	0	0	0	0	0	2	0	2
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:00-07:15	0	3	0	0	0	0	0	0	0	0	3	0	6
07:15-07:30	0	0	0	0	0	0	0	0	0	0	1	0	1
07:30-07:45	0	1	0	0	0	0	0	0	0	0	10	0	11
07:45-08:00	0	1	0	0	0	0	0	0	0	0	3	0	4
BICYCLES													
07:00-07:15	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	0	1	0	0	0	0	0	0	0	0	0	0	1
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	1	0	0	0	0	0	0	0	0	0	0	1

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
07:00-07:15	0	0	0	0	0
07:15-07:30	0	0	0	0	0
07:30-07:45	0	0	0	0	0
07:45-08:00	0	1	0	0	1

Peak Hour by Movement													
PHF	.81	.88	.79	.69	.69	.65	.75	.69	.64	.57	.89	.75	.927
% Trucks(all)	0	5.8	4.5	0	2.8	2.3	16.7	4.5	3.6	12.5	14.2	8.3	7.2
% Trucks(M+H)	0	1.4	0	0	2.8	0	8.3	2.3	0	0	9.2	0	3.1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	26	503	22	22	36	44	12	44	28	16	218	12	983
07:15-08:15	32	495	23	17	40	34	15	44	32	19	196	13	960
07:30-08:30	27	463	24	19	37	34	15	41	32	23	191	17	923
07:45-08:45	25	395	21	23	35	30	14	37	30	21	181	23	835
08:00-09:00	21	365	22	29	26	16	15	32	28	22	174	24	774

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
HIGHWAY 47 AT MAPLE STREET

17712



DATE OF COUNT: 10/22/98
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

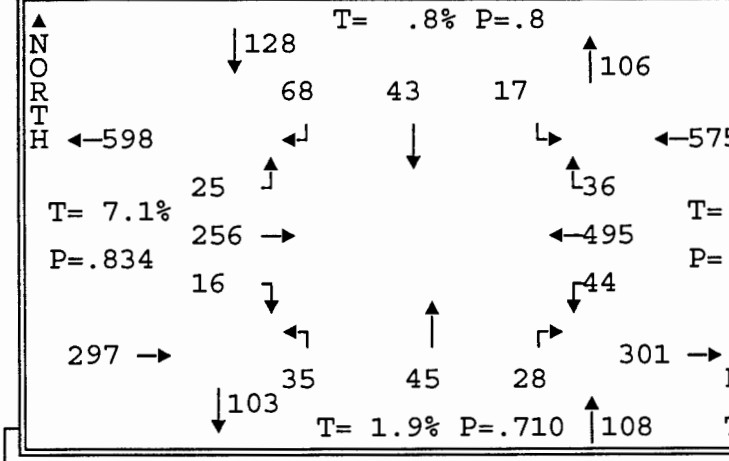
MCLP

Peak Hour
16:05-17:05
TEV=1120

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	0	17	3	3	5	5	0	3	2	5	32	5	80
16:05-16:10	5	24	3	3	1	2	6	7	3	4	45	7	110
16:10-16:15	0	38	4	5	4	4	4	6	5	2	37	2	111
16:15-16:20	1	26	5	4	1	3	5	7	6	3	32	4	97
16:20-16:25	1	24	3	5	0	2	2	6	2	1	37	3	86
16:25-16:30	2	24	0	4	3	4	5	4	2	3	28	1	80
16:30-16:35	3	29	2	2	2	2	3	3	0	3	54	1	104
16:35-16:40	2	18	3	9	4	1	4	3	3	4	41	3	95
16:40-16:45	2	30	0	5	2	3	4	3	4	1	35	6	95
16:45-16:50	0	22	4	3	2	0	3	8	6	4	30	3	85
16:50-16:55	1	19	3	4	2	0	2	2	0	1	35	3	72
16:55-17:00	2	20	1	3	3	1	3	11	2	3	35	1	85
17:00-17:05	2	30	1	4	5	0	2	5	1	4	42	4	100
17:05-17:10	2	19	1	2	5	1	0	3	2	5	34	4	78
17:10-17:15	2	26	6	5	2	0	1	0	2	6	42	6	98
17:15-17:20	2	26	3	10	8	0	8	4	3	3	38	2	107
17:20-17:25	3	21	3	6	1	3	5	3	4	3	47	2	101
17:25-17:30	0	23	2	5	2	5	2	5	4	4	27	4	83
17:30-17:35	1	21	4	8	1	1	1	5	3	6	54	2	107
17:35-17:40	1	20	2	9	3	3	1	1	1	5	57	2	105
17:40-17:45	0	13	1	3	3	0	7	13	2	4	38	1	85
17:45-17:50	1	16	1	5	6	2	0	2	4	3	42	5	87
17:50-17:55	1	18	0	7	5	1	4	2	1	0	42	2	83
17:55-18:00	1	23	1	4	2	1	4	2	1	1	32	2	74
Total Survey	35	547	56	118	72	44	76	108	63	78	936	75	2208
PHF	.75	.86	.6	.75	.73	.61	.72	.77	.61	.82	.87	.73	.880
% Trucks	2.9	7.1	3.6	.8	0	4.5	3.9	0	0	3.8	4.9	1.3	4.4
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	19	291	31	50	29	27	41	63	35	34	441	39	1100
16:15-17:15	20	287	29	50	31	17	34	55	30	38	445	39	1075
16:30-17:30	21	283	29	58	38	16	37	50	31	41	460	39	1103
16:45-17:45	16	260	31	62	37	14	35	60	30	48	479	34	1106
17:00-18:00	16	256	25	68	43	17	35	45	28	44	495	36	1108

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
HIGHWAY 47 AT MAPLE STREET



DATE OF COUNT: 10/22/98
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

MCLP

Peak Hour
17:00-18:00
TEV=1108

Traffic Smithy
(503)641-6333

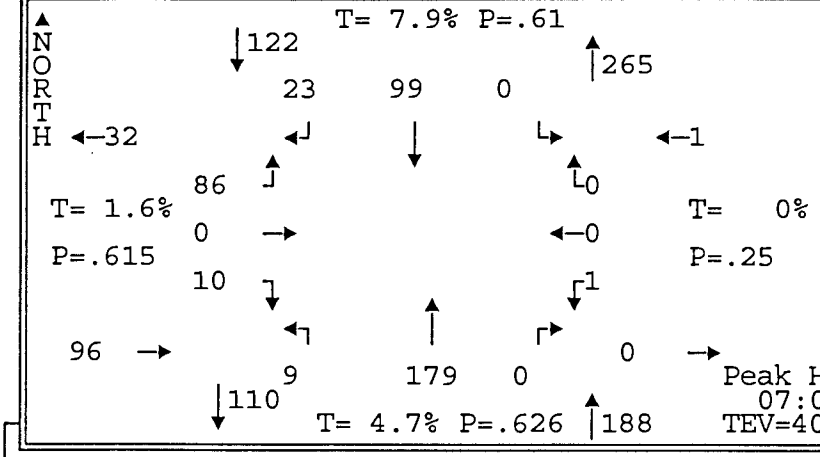
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↓	SOUTH BOUND ←	SOUTH BOUND ↑	NORTH BOUND ↓	NORTH BOUND →	NORTH BOUND ↑	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
17:00-17:15	6	75	8	11	12	1	3	8	5	15	118	14	276
17:15-17:30	5	70	8	21	11	8	15	12	11	10	112	8	291
17:30-17:45	2	54	7	20	7	4	9	19	6	15	149	5	297
17:45-18:00	3	57	2	16	13	4	8	6	6	4	116	9	244
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
17:00-17:15	0	3	0	0	0	0	0	0	0	1	3	0	7
17:15-17:30	1	4	0	0	0	1	0	0	0	0	1	0	7
17:30-17:45	0	2	0	0	0	0	0	0	0	0	1	0	3
17:45-18:00	0	3	0	0	0	0	0	0	0	1	3	0	7
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
17:00-17:15	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15-17:30	0	0	0	0	0	0	0	0	0	0	1	0	1
17:30-17:45	0	0	0	0	0	0	2	0	0	1	0	0	3
17:45-18:00	0	1	0	0	0	0	0	0	0	0	0	0	1
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
17:00-17:15	0	1	0	0	0	0	0	0	0	0	1	0	2
17:15-17:30	0	0	0	0	0	0	0	0	0	0	3	0	3
17:30-17:45	0	1	0	0	0	0	0	0	0	0	2	0	3
17:45-18:00	0	5	0	0	0	0	0	0	0	0	2	0	7
BICYCLES													
17:00-17:15	0	0	0	0	1	0	0	1	0	0	0	0	2
17:15-17:30	0	0	0	0	1	0	0	1	0	0	0	0	2
17:30-17:45	0	1	0	0	0	0	0	0	0	0	0	0	1
17:45-18:00	0	0	0	0	0	0	0	0	0	1	0	0	1

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
17:00-17:15	0	0	0	0	0
17:15-17:30	0	0	0	0	0
17:30-17:45	0	0	0	0	0
17:45-18:00	0	0	0	0	0

Peak Hour by Movement													
PHF	.67	.85	.78	.81	.83	.53	.58	.59	.64	.73	.83	.64	.932
% Trucks(all)	6.3	7.8	0	0	0	5.9	5.7	0	0	6.8	3.6	0	4.1
% Trucks(M+H)	0	3.1	0	0	0	0	5.7	0	0	2.3	2	0	1.9
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	19	291	31	50	29	27	41	63	35	34	441	39	1100
16:15-17:15	20	287	29	50	31	17	34	55	30	38	445	39	1075
16:30-17:30	21	283	29	58	38	16	37	50	31	41	460	39	1103
16:45-17:45	16	260	31	62	37	14	35	60	30	48	479	34	1106
17:00-18:00	16	256	25	68	43	17	35	45	28	44	495	36	1108

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
WATERCREST ROAD AT THATCHER ROAD

17883



DATE OF COUNT: 11/10/98
DAY OF WEEK: Tue
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

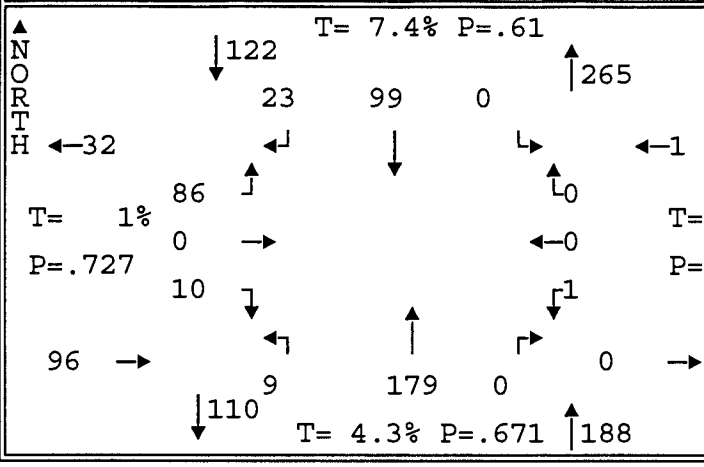
jjaf

Peak Hour
07:00-08:00
TEV=407

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	2	0	6	0	5	0	0	7	0	1	0	0	21
07:05-07:10	0	0	3	1	4	0	1	7	0	0	0	0	16
07:10-07:15	0	0	5	0	3	0	1	10	0	0	0	0	19
07:15-07:20	1	0	8	1	10	0	0	12	0	0	0	0	32
07:20-07:25	1	0	1	2	8	0	1	11	0	0	0	0	24
07:25-07:30	3	0	10	2	4	0	0	14	0	0	0	0	33
07:30-07:35	2	0	8	2	5	0	1	21	0	0	0	0	39
07:35-07:40	0	0	13	4	9	0	1	23	0	0	0	0	50
07:40-07:45	1	0	9	3	9	0	1	23	0	0	0	0	46
07:45-07:50	0	0	16	4	15	0	2	25	0	0	0	0	62
07:50-07:55	0	0	6	3	15	0	0	12	0	0	0	0	36
07:55-08:00	0	0	1	1	12	0	1	14	0	0	0	0	29
08:00-08:05	0	0	2	0	10	0	0	6	0	0	0	0	18
08:05-08:10	1	0	1	0	5	0	0	4	0	0	0	0	11
08:10-08:15	1	0	3	0	3	0	1	6	0	0	0	0	14
08:15-08:20	0	0	2	1	5	0	1	1	0	0	0	0	10
08:20-08:25	2	0	4	0	3	0	0	8	0	0	0	0	17
08:25-08:30	1	0	1	0	7	0	0	7	0	0	0	0	16
08:30-08:35	1	0	0	0	6	0	0	6	0	0	0	0	13
08:35-08:40	0	0	1	0	6	0	0	5	0	0	0	0	12
08:40-08:45	0	0	1	2	5	0	0	4	0	0	0	0	12
08:45-08:50	1	0	3	0	10	0	1	4	0	0	0	0	19
08:50-08:55	2	0	2	1	6	0	0	6	0	0	0	0	17
08:55-09:00	0	0	0	1	9	0	0	10	0	0	0	0	20
Total Survey	19	0	106	28	174	0	12	246	0	1	0	0	586
PHF	.42	0	.57	.52	.59	0	.56	.63	0	.25	0	0	.643
% Trucks	5.3	0	.9	7.1	8	0	0	4.9	0	0	0	0	5.1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	10	0	86	23	99	0	9	179	0	1	0	0	407
07:15-08:15	10	0	78	22	105	0	8	171	0	0	0	0	394
07:30-08:30	8	0	66	18	98	0	8	150	0	0	0	0	348
07:45-08:45	6	0	38	11	92	0	5	98	0	0	0	0	250
08:00-09:00	9	0	20	5	75	0	3	67	0	0	0	0	179

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
WATERCREST ROAD AT THATCHER ROAD



DATE OF COUNT: 11/10/98
DAY OF WEEK: Tue
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

jjaf

Peak Hour
07:00-08:00
TEV=407

Traffic Smithy
(503)641-6333

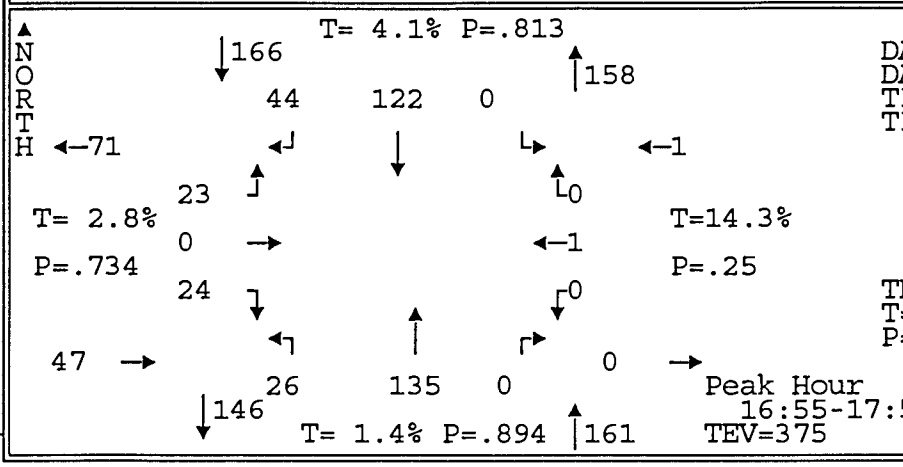
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:00-07:15	2	0	14	1	12	0	2	24	0	1	0	0	56
07:15-07:30	5	0	19	5	22	0	1	37	0	0	0	0	89
07:30-07:45	3	0	30	9	23	0	3	67	0	0	0	0	135
07:45-08:00	0	0	23	8	42	0	3	51	0	0	0	0	127
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:00-07:15	0	0	0	0	1	0	0	0	0	0	0	0	1
07:15-07:30	0	0	1	1	2	0	0	4	0	0	0	0	8
07:30-07:45	0	0	0	0	2	0	0	1	0	0	0	0	3
07:45-08:00	0	0	0	0	3	0	0	2	0	0	0	0	5
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:00-07:15	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:00-07:15	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	0	0	0	0	0	0	1	0	0	0	0	1
BICYCLES													
07:00-07:15	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	0	0

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
07:00-07:15	0	0	0	0	0
07:15-07:30	0	0	0	0	0
07:30-07:45	0	0	0	0	0
07:45-08:00	0	0	0	0	0

Peak Hour by Movement													
PHF	.5	0	.72	.64	.59	0	.75	.67	0	.25	0	0	.753
% Trucks(all)	0	0	1.2	4.3	8.1	0	0	4.5	0	0	0	0	4.4
% Trucks(M+H)	0	0	0	0	0	0	0	.6	0	0	0	0	.2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	10	0	86	23	99	0	9	179	0	1	0	0	407
07:15-08:15	10	0	78	22	105	0	8	171	0	0	0	0	394
07:30-08:30	8	0	66	18	98	0	8	150	0	0	0	0	348
07:45-08:45	6	0	38	11	92	0	5	98	0	0	0	0	250
08:00-09:00	9	0	20	5	75	0	3	67	0	0	0	0	179

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
WATERCREST ROAD AT THATCHER ROAD

17725



DATE OF COUNT: 10/22/98
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 17:55

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

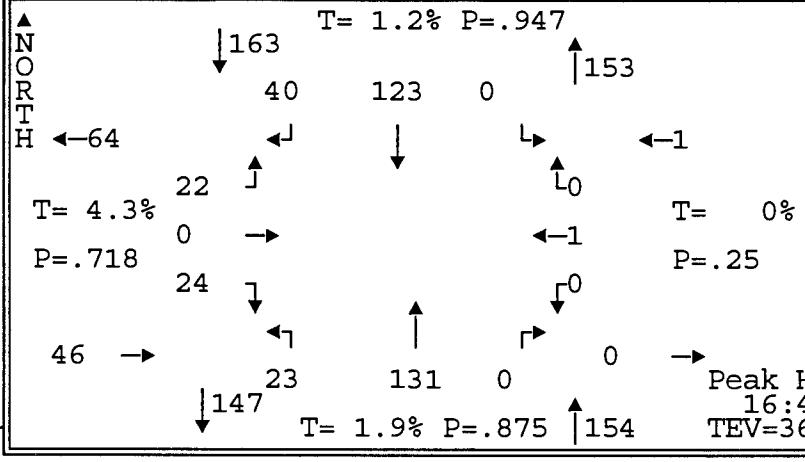
PLAG

Peak Hour
16:55-17:55
TEV=375

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	WEST BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	0	0	0	2	7	0	2	3	1	0	4	0	19
16:05-16:10	4	0	2	3	21	0	1	14	0	0	0	0	45
16:10-16:15	1	1	0	2	11	0	3	11	0	0	0	0	29
16:15-16:20	0	0	2	3	9	0	1	5	0	0	0	0	20
16:20-16:25	0	0	4	3	18	0	1	8	0	0	1	0	35
16:25-16:30	0	0	1	3	11	0	1	7	0	0	0	0	23
16:30-16:35	0	0	1	1	9	0	0	14	0	0	0	0	25
16:35-16:40	1	0	0	1	12	0	2	7	0	0	1	0	24
16:40-16:45	3	0	1	2	8	0	1	12	0	0	0	0	27
16:45-16:50	0	0	2	3	12	0	0	10	0	0	0	0	27
16:50-16:55	1	0	0	2	9	0	2	11	0	0	0	0	25
16:55-17:00	4	0	2	1	16	0	4	12	0	0	0	0	39
17:00-17:05	2	0	0	4	5	0	1	6	0	0	0	0	18
17:05-17:10	1	0	1	5	15	0	5	9	0	0	0	0	36
17:10-17:15	2	0	3	2	10	0	1	13	0	0	0	0	31
17:15-17:20	3	0	3	1	9	0	2	15	0	0	0	0	33
17:20-17:25	2	0	2	9	6	0	2	10	0	0	0	0	31
17:25-17:30	2	0	0	6	7	0	2	13	0	0	0	0	30
17:30-17:35	1	0	1	0	14	0	2	15	0	0	1	0	34
17:35-17:40	5	0	5	2	3	0	0	10	0	0	0	0	25
17:40-17:45	1	0	3	5	17	0	2	7	0	0	0	0	35
17:45-17:50	1	0	0	5	10	0	4	16	0	0	0	0	36
17:50-17:55	0	0	3	4	10	0	1	9	0	0	0	0	27
Total Survey	34	1	36	69	249	0	40	237	1	0	7	0	674
PHF	.75	0	.64	.69	.82	0	.65	.89	0	0	.25	0	.937
% Trucks	5.9	0	0	1.4	4.8	0	0	1.7	0	0	14.3	0	3
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	0	0	0	0	0	0	0	0	0	17	0	
Hourly Totals													
16:00-17:00	14	1	15	26	143	0	18	114	1	0	6	0	338
16:15-17:15	14	0	17	30	134	0	19	114	0	0	2	0	330
16:30-17:30	21	0	15	37	118	0	22	132	0	0	1	0	346
16:45-17:45	24	0	22	40	123	0	23	131	0	0	1	0	364

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
WATERCREST ROAD AT THATCHER ROAD



DATE OF COUNT: 10/22/98
DAY OF WEEK: Thu
TIME STARTED: 16:00
TIME ENDED: 17:55

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

PLAG

Peak Hour
16:45-17:45
TEV=364

Traffic Smithy
(503)641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
16:45-17:00	5	0	4	6	37	0	6	33	0	0	0	0	91
17:00-17:15	5	0	4	11	30	0	7	28	0	0	0	0	85
17:15-17:30	7	0	5	16	22	0	6	38	0	0	0	0	94
17:30-17:45	7	0	9	7	34	0	4	32	0	0	1	0	94
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:45-17:00	1	0	0	0	1	0	0	0	0	0	0	0	2
17:00-17:15	0	0	0	0	1	0	0	0	0	0	0	0	1
17:15-17:30	0	0	0	0	0	0	0	2	0	0	0	0	2
17:30-17:45	0	0	0	0	0	0	0	1	0	0	0	0	1
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	1	0	0	0	0	0	0	0	0	0	0	0	1
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0
BICYCLES													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	1	0	1
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0

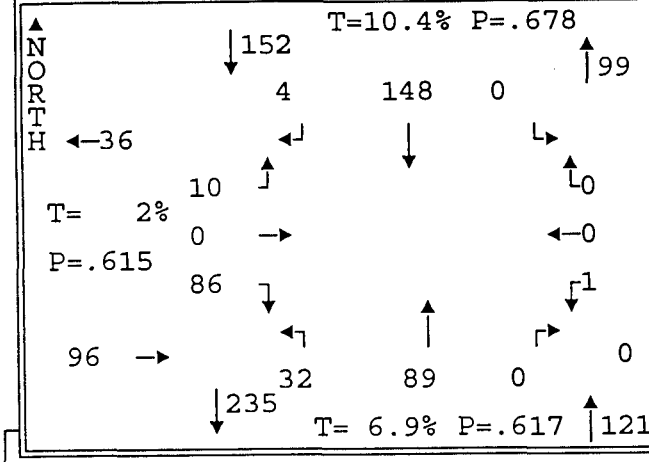
PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
16:45-17:00	0	0	0	0	0
17:00-17:15	0	0	0	1	1
17:15-17:30	0	0	0	5	5
17:30-17:45	0	0	0	4	4

Peak Hour by Movement													
PHF	.86	0	.61	.63	.83	0	.82	.86	0	0	.25	0	.968
% Trucks(all)	8.3	0	0	0	1.6	0	0	2.3	0	0	0	0	1.9
% Trucks(M+H)	4.2	0	0	0	0	0	0	0	0	0	0	0	.3
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	

Hourly Totals													
16:00-17:00	14	1	15	26	143	0	18	114	1	0	6	0	338
16:15-17:15	14	0	17	30	134	0	19	114	0	0	2	0	330
16:30-17:30	21	0	15	37	118	0	22	132	0	0	1	0	346
16:45-17:45	24	0	22	40	123	0	23	131	0	0	1	0	364

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
MAIN STREET AT 23RD AVENUE

17699



DATE OF COUNT: 10/21/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

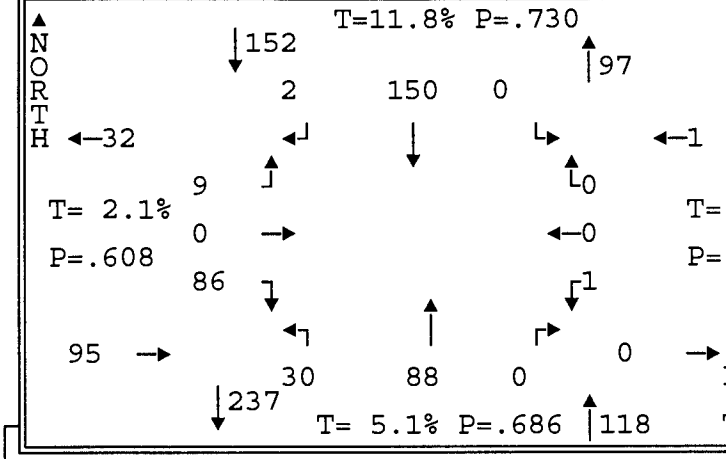
ELAT

Peak Hour
07:10-08:10
TEV=370

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	WEST BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	5	0	1	1	9	0	2	2	0	0	0	0	20
07:05-07:10	8	0	0	0	3	0	1	2	0	0	0	0	14
07:10-07:15	7	0	1	2	5	0	4	4	0	0	0	0	23
07:15-07:20	5	0	1	0	9	0	1	5	0	0	0	0	21
07:20-07:25	2	0	1	1	12	0	0	8	0	0	0	0	24
07:25-07:30	4	0	0	1	10	0	5	7	0	0	0	0	27
07:30-07:35	4	0	2	0	9	0	3	7	0	0	0	0	25
07:35-07:40	7	0	0	0	14	0	2	16	0	0	0	0	39
07:40-07:45	5	0	0	0	21	0	1	14	0	0	0	0	41
07:45-07:50	11	0	1	0	13	0	6	10	0	0	0	0	41
07:50-07:55	16	0	2	0	22	0	3	6	0	1	0	0	50
07:55-08:00	9	0	0	0	17	0	6	6	0	0	0	0	38
08:00-08:05	11	0	1	0	8	0	1	3	0	0	0	0	24
08:05-08:10	5	0	1	0	8	0	0	3	0	0	0	0	17
08:10-08:15	7	0	0	0	7	0	2	3	0	0	0	0	19
08:15-08:20	4	0	1	0	7	0	2	5	0	0	0	0	19
08:20-08:25	5	0	1	0	7	0	5	2	0	0	0	0	20
08:25-08:30	11	0	1	0	4	0	2	1	0	0	0	0	19
08:30-08:35	5	0	1	2	5	0	1	3	0	1	0	0	18
08:35-08:40	8	0	1	0	4	0	4	4	0	0	0	0	21
08:40-08:45	3	0	0	1	6	0	6	7	0	0	0	0	23
08:45-08:50	13	0	1	2	14	0	3	10	0	0	0	0	43
08:50-08:55	13	0	2	2	9	0	5	11	0	0	0	0	42
08:55-09:00	11	0	0	0	6	0	4	9	0	0	0	0	30
Total Survey	179	0	19	12	229	0	69	148	0	2	0	0	658
PHF	.6	0	.83	.33	.66	0	.53	.56	0	.25	0	0	.700
% Trucks	2.2	0	0	8.3	10.5	0	2.9	8.8	0	0	0	0	6.7
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	6	0	0	2	0	0	14	0	0	12	0	
Hourly Totals													
07:00-08:00	83	0	9	5	144	0	34	87	0	1	0	0	363
07:15-08:15	86	0	9	2	150	0	30	88	0	1	0	0	366
07:30-08:30	95	0	10	0	137	0	33	76	0	1	0	0	352
07:45-08:45	95	0	10	3	108	0	38	53	0	2	0	0	309
08:00-09:00	96	0	10	7	85	0	35	61	0	1	0	0	295

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
MAIN STREET AT 23RD AVENUE



DATE OF COUNT: 10/21/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ELAT

Peak Hour
07:15-08:15
TEV=366

Traffic Smithy
(503)641-6333

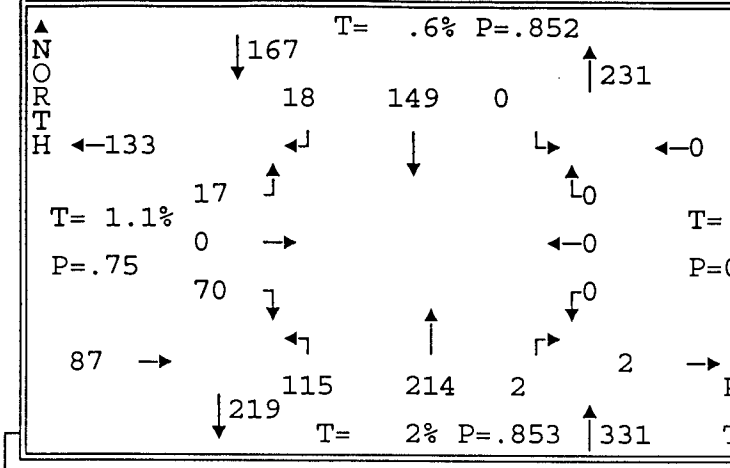
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:15-07:30	11	0	2	2	31	0	6	20	0	0	0	0	72
07:30-07:45	16	0	2	0	44	0	6	37	0	0	0	0	105
07:45-08:00	36	0	3	0	52	0	15	22	0	1	0	0	129
08:00-08:15	23	0	2	0	23	0	3	9	0	0	0	0	60
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	0	0	0	2	0	0	0	0	2
07:45-08:00	0	0	0	0	1	0	0	0	0	0	0	0	1
08:00-08:15	0	0	0	0	1	0	0	0	0	0	0	0	1
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	3	0	0	1	0	0	0	0	4
07:45-08:00	2	0	0	0	2	0	1	0	0	0	0	0	5
08:00-08:15	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:15-07:30	0	0	0	0	5	0	0	0	0	0	0	0	5
07:30-07:45	0	0	0	0	1	0	0	2	0	0	0	0	3
07:45-08:00	0	0	0	0	3	0	0	0	0	0	0	0	3
08:00-08:15	0	0	0	0	2	0	0	0	0	0	0	0	2
BICYCLES													
07:15-07:30	0	0	1	0	0	0	0	0	0	0	0	0	1
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	5	0	0	0	2	0	1	0	0	0	0	0	8
08:00-08:15	2	0	0	0	0	0	0	0	0	0	0	0	2

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
07:15-07:30	0	0	1	1	2
07:30-07:45	0	0	1	0	1
07:45-08:00	0	0	1	2	3
08:00-08:15	3	1	3	1	8

Peak Hour by Movement													
PHF	.6	0	.75	.25	.72	0	.5	.59	0	.25	0	0	.709
% Trucks(all)	2.3	0	0	0	12	0	3.3	5.7	0	0	0	0	7.1
% Trucks(M+H)	2.3	0	0	0	10.7	0	3.3	3.4	0	0	0	0	6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	83	0	9	5	144	0	34	87	0	1	0	0	363
07:15-08:15	86	0	9	2	150	0	30	88	0	1	0	0	366
07:30-08:30	95	0	10	0	137	0	33	76	0	1	0	0	352
07:45-08:45	95	0	10	3	108	0	38	53	0	2	0	0	309
08:00-09:00	96	0	10	7	85	0	35	61	0	1	0	0	295

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
23RD AVENUE AT MAIN STREET

17698



DATE OF COUNT: 10/21/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

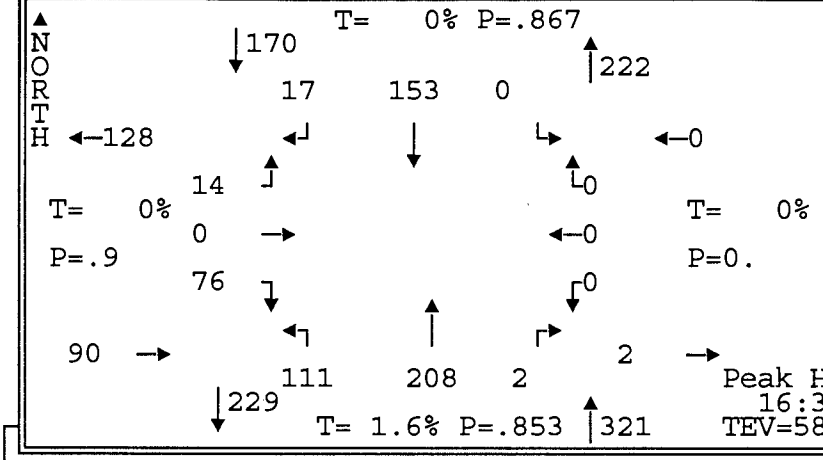
ELAU

Peak Hour
16:35-17:35
TEV=585

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↲	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:00-16:05	7	0	1	0	11	0	8	15	0	0	0	0	42
16:05-16:10	15	0	0	0	18	0	14	13	0	0	0	0	60
16:10-16:15	5	0	1	1	14	0	5	17	0	0	0	0	43
16:15-16:20	6	0	1	0	14	0	13	15	0	0	0	0	49
16:20-16:25	3	0	0	0	13	0	9	11	0	0	0	0	36
16:25-16:30	4	0	1	2	9	0	9	15	0	0	0	0	40
16:30-16:35	9	0	1	1	13	0	5	13	0	0	0	0	42
16:35-16:40	9	0	1	3	12	0	9	16	0	0	0	0	50
16:40-16:45	4	0	1	2	18	0	12	16	0	0	0	0	53
16:45-16:50	5	0	1	1	13	0	10	14	0	0	0	0	44
16:50-16:55	7	0	1	3	7	0	7	21	0	0	0	0	46
16:55-17:00	10	0	1	0	11	0	8	14	0	0	0	0	44
17:00-17:05	9	0	1	1	10	0	6	17	0	0	0	0	44
17:05-17:10	3	0	4	0	12	0	13	24	0	0	0	0	56
17:10-17:15	4	0	1	2	13	0	9	25	0	0	0	0	54
17:15-17:20	4	0	1	1	9	0	7	19	0	0	0	0	41
17:20-17:25	7	0	0	2	14	0	10	13	0	0	0	0	46
17:25-17:30	5	0	1	1	21	0	15	16	2	0	0	0	61
17:30-17:35	3	0	4	2	9	0	9	19	0	0	0	0	46
17:35-17:40	9	0	2	0	11	0	13	11	0	1	0	0	47
17:40-17:45	9	0	0	1	12	0	8	14	0	0	0	0	44
17:45-17:50	6	0	1	3	14	0	14	9	0	0	0	0	47
17:50-17:55	5	0	1	1	10	0	7	12	0	0	0	0	36
17:55-18:00	4	0	1	1	19	0	14	15	0	0	0	0	54
Total Survey	152	0	27	28	307	0	234	374	2	1	0	0	1125
PHF	.67	0	.71	.75	.85	0	.85	.79	.25	0	0	0	.949
% Trucks	1.3	0	0	0	.7	0	.9	2.7	0	0	0	0	1.4
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	5	0	0	9	0	0	15	0	0	17	0	
Hourly Totals													
16:00-17:00	84	0	10	13	153	0	109	180	0	0	0	0	549
16:15-17:15	73	0	14	15	145	0	110	201	0	0	0	0	558
16:30-17:30	76	0	14	17	153	0	111	208	2	0	0	0	581
16:45-17:45	75	0	17	14	142	0	115	207	2	1	0	0	573
17:00-18:00	68	0	17	15	154	0	125	194	2	1	0	0	576

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
23RD AVENUE AT MAIN STREET



DATE OF COUNT: 10/21/98
DAY OF WEEK: Wed
TIME STARTED: 16:00
TIME ENDED: 18:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

ELAU

Peak Hour
16:30-17:30
TEV=581

Traffic Smithy
(503)641-6333

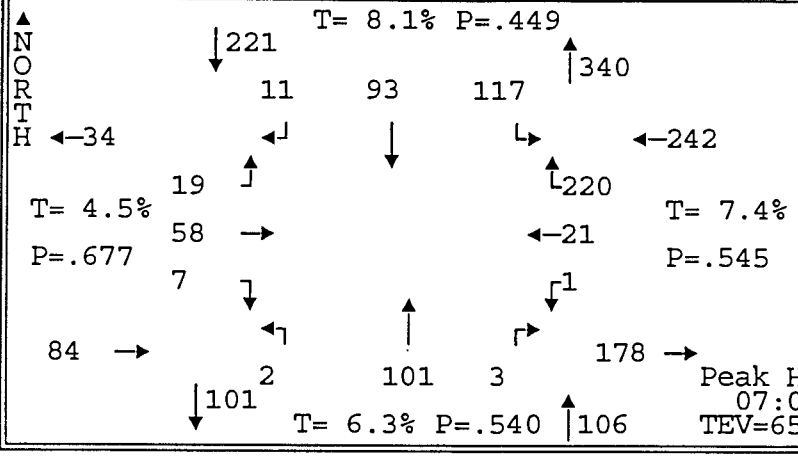
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
16:30-16:45	22	0	3	6	43	0	26	45	0	0	0	0	145
16:45-17:00	22	0	3	4	31	0	25	49	0	0	0	0	134
17:00-17:15	16	0	6	3	35	0	28	66	0	0	0	0	154
17:15-17:30	16	0	2	4	44	0	32	48	2	0	0	0	148
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:30-16:45	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	0	0	0	0	0	0	0	1	0	0	0	0	1
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	0	0	0	0	0	2	0	0	0	0	0	2
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:30-16:45	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:30-16:45	0	0	0	0	0	0	0	2	0	0	0	0	2
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	0
BICYCLES													
16:30-16:45	0	0	0	0	0	0	0	3	0	0	0	0	3
16:45-17:00	1	0	0	0	2	0	0	1	0	0	0	0	4
17:00-17:15	1	0	0	0	0	0	1	0	0	0	0	0	2
17:15-17:30	0	0	0	1	0	0	2	1	0	0	0	0	4

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
16:30-16:45	0	0	0	1	1
16:45-17:00	0	1	2	1	4
17:00-17:15	3	0	4	6	13
17:15-17:30	1	1	5	0	7

Peak Hour by Movement													
PHF	.86	0	.58	.71	.87	0	.87	.79	.25	0	0	0	.943
% Trucks(all)	0	0	0	0	0	0	1.8	1.4	0	0	0	0	.9
% Trucks(M+H)	0	0	0	0	0	0	0	1	0	0	0	0	.3
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:00-17:00	84	0	10	13	153	0	109	180	0	0	0	0	549
16:15-17:15	73	0	14	15	145	0	110	201	0	0	0	0	558
16:30-17:30	76	0	14	17	153	0	111	208	2	0	0	0	581
16:45-17:45	75	0	17	14	142	0	115	207	2	1	0	0	573
17:00-18:00	68	0	17	15	154	0	125	194	2	1	0	0	576

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
B STREET AT WILLAMINA AVENUE

17754



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

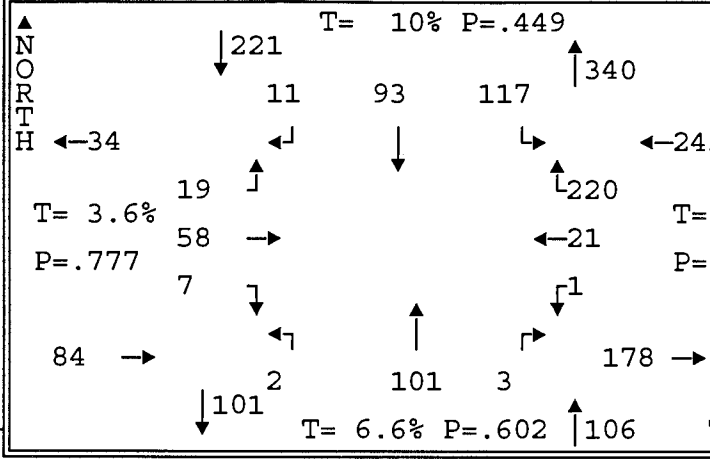
SSIS

Peak Hour
07:00-08:00
TEV=653

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↓	SOUTH BOUND ←	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
07:00-07:05	1	5	1	1	2	3	0	0	0	0	3	9	25
07:05-07:10	0	4	0	2	1	3	0	4	0	0	0	6	20
07:10-07:15	0	7	0	0	3	5	0	2	1	0	1	6	25
07:15-07:20	1	4	0	0	2	2	0	3	0	0	2	6	20
07:20-07:25	0	4	2	0	2	4	0	4	1	0	1	8	26
07:25-07:30	0	8	2	0	2	2	0	5	1	0	2	12	34
07:30-07:35	2	3	3	2	5	8	0	12	0	0	3	22	60
07:35-07:40	0	8	5	2	10	11	0	20	0	1	1	29	87
07:40-07:45	0	5	1	0	17	9	0	12	0	0	0	38	82
07:45-07:50	0	3	2	3	18	20	0	17	0	0	4	37	104
07:50-07:55	1	4	2	1	13	27	0	14	0	0	1	31	94
07:55-08:00	2	3	1	0	18	23	2	8	0	0	3	16	76
08:00-08:05	1	1	0	2	3	6	0	1	0	0	3	8	25
08:05-08:10	1	3	1	1	1	4	0	1	0	0	1	3	16
08:10-08:15	0	2	2	0	3	0	0	2	1	0	0	2	12
08:15-08:20	0	3	1	2	2	1	0	0	0	0	1	2	12
08:20-08:25	0	2	0	0	1	2	0	1	1	0	4	1	12
08:25-08:30	0	2	0	1	1	3	0	1	1	0	6	1	16
08:30-08:35	0	3	1	0	2	1	0	1	0	0	4	3	15
08:35-08:40	1	3	0	1	2	2	0	0	0	0	0	0	9
08:40-08:45	0	3	0	0	3	2	0	2	0	1	2	2	15
08:45-08:50	0	2	0	1	3	2	0	2	0	0	1	2	13
08:50-08:55	2	4	0	2	8	3	0	1	2	0	2	4	28
08:55-09:00	4	3	3	0	8	2	0	3	0	0	2	1	26
Total Survey	16	89	27	21	130	145	2	116	8	2	47	249	852
PHF	.58	.76	.47	.55	.47	.42	.25	.52	.38	.25	.66	.52	.583
% Trucks	6.3	4.5	3.7	9.5	10.8	5.5	50	6	0	0	14.9	6	7
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	6	0	0	24	0	0	10	0	0	8	0	
Hourly Totals													
07:00-08:00	7	58	19	11	93	117	2	101	3	1	21	220	653
07:15-08:15	8	48	21	11	94	116	2	99	3	1	21	212	636
07:30-08:30	7	39	18	14	92	114	2	89	3	1	27	190	596
07:45-08:45	6	32	10	11	67	91	2	48	3	1	29	106	406
08:00-09:00	9	31	8	10	37	28	0	15	5	1	26	29	199

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
B STREET AT WILLAMINA AVENUE



DATE OF COUNT: 10/28/98
DAY OF WEEK: Wed
TIME STARTED: 07:00
TIME ENDED: 09:00

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

SSIS

Peak Hour
07:00-08:00
TEV=653

Traffic Smithy
(503)641-6333

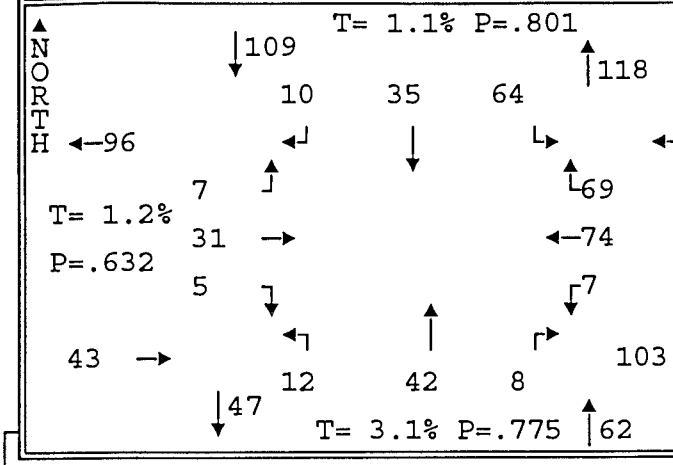
TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	NORTH BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
07:00-07:15	1	16	1	3	6	11	0	6	1	0	4	21	70
07:15-07:30	1	16	4	0	6	8	0	12	2	0	5	26	80
07:30-07:45	2	16	9	4	32	28	0	44	0	1	4	89	229
07:45-08:00	3	10	5	4	49	70	2	39	0	0	8	84	274
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
07:00-07:15	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	0	2	0	0	1	0	0	2	0	0	0	4	9
07:30-07:45	0	0	0	2	10	4	0	4	0	0	1	7	28
07:45-08:00	0	0	1	0	1	3	0	0	0	0	1	2	8
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
07:00-07:15	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45-08:00	0	0	0	0	0	0	1	0	0	0	0	0	1
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
07:00-07:15	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15-07:30	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30-07:45	0	0	0	0	0	1	0	0	0	0	0	0	1
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	1	1
BICYCLES													
07:00-07:15	0	0	0	0	0	0	0	0	0	0	0	2	2
07:15-07:30	0	0	0	0	0	0	0	1	0	0	0	0	1
07:30-07:45	0	0	0	0	0	0	0	1	0	0	0	1	2
07:45-08:00	0	0	0	0	0	0	0	0	0	0	0	3	3

PEDESTRIANS	CROSSWALK USEAGE SOUTH	WEST	EAST	NORTH	ALL
07:00-07:15	0	1	0	3	4
07:15-07:30	1	4	2	3	10
07:30-07:45	2	6	6	1	15
07:45-08:00	0	7	0	0	7

Peak Hour by Movement													
PHF	.58	.91	.53	.69	.47	.42	.25	.57	.38	.25	.66	.62	.595
% Trucks(all)	0	3.4	5.3	18.2	12.9	6.8	50	5.9	0	0	9.5	6.4	7.4
% Trucks(M+H)	0	0	0	0	0	.9	50	0	0	0	0	.5	.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
07:00-08:00	7	58	19	11	93	117	2	101	3	1	21	220	653
07:15-08:15	8	48	21	11	94	116	2	99	3	1	21	212	636
07:30-08:30	7	39	18	14	92	114	2	89	3	1	27	190	596
07:45-08:45	6	32	10	11	67	91	2	48	3	1	29	106	406
08:00-09:00	9	31	8	10	37	28	0	15	5	1	26	29	199

INTERSECTION TURN MOVEMENT COUNT SUMMARY REPORT
WILLAMINA ROAD AT B STREET

17724



DATE OF COUNT: 10/21/98
DAY OF WEEK: Wed
TIME STARTED: 16:15
TIME ENDED: 18:05

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

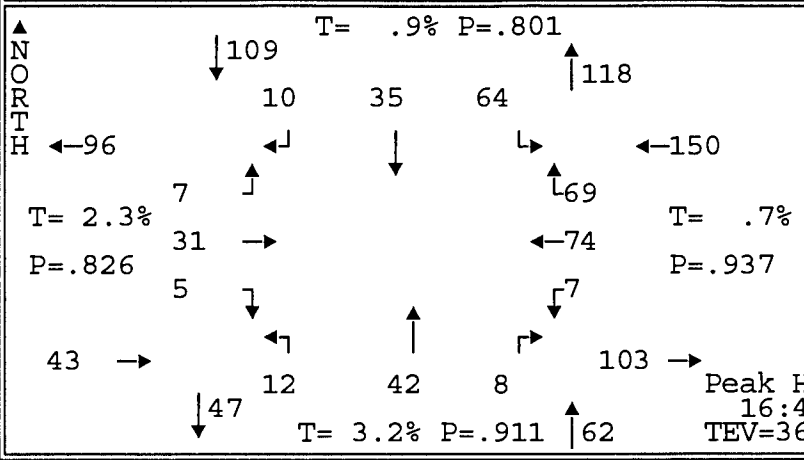
PLAF

Peak Hour
16:45-17:45
TEV=364

Traffic Smithy
(503) 641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↵	SOUTH BOUND ↓	SOUTH BOUND ↳	NORTH BOUND ↰	NORTH BOUND ↑	WEST BOUND ↱	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
16:15-16:20	0	2	2	2	2	6	0	3	0	1	2	4	24
16:20-16:25	1	2	0	1	1	1	1	1	0	1	8	5	22
16:25-16:30	0	4	0	1	1	1	1	4	1	0	5	3	21
16:30-16:35	0	5	0	0	5	5	2	2	0	1	5	5	30
16:35-16:40	0	5	0	0	1	1	0	4	0	1	6	2	20
16:40-16:45	0	3	1	0	1	2	0	1	1	2	9	3	23
16:45-16:50	1	1	0	0	6	5	3	4	1	0	4	8	33
16:50-16:55	1	4	1	1	2	7	0	2	0	1	7	5	31
16:55-17:00	0	2	0	0	1	4	0	4	3	0	7	3	24
17:00-17:05	0	2	0	0	5	4	1	1	0	0	9	5	27
17:05-17:10	0	1	0	0	1	4	0	4	0	2	5	3	20
17:10-17:15	0	1	4	3	4	5	0	6	0	1	4	8	36
17:15-17:20	0	4	0	1	4	2	2	4	1	0	8	8	34
17:20-17:25	2	6	0	1	2	5	2	2	1	0	6	4	31
17:25-17:30	0	1	0	1	2	5	2	2	1	0	8	6	28
17:30-17:35	1	1	1	1	3	6	1	8	1	0	3	9	35
17:35-17:40	0	7	1	1	2	12	1	3	0	1	6	5	39
17:40-17:45	0	1	0	1	3	5	0	2	0	2	7	5	26
17:45-17:50	3	2	1	1	2	3	0	4	1	1	2	3	23
17:50-17:55	1	6	0	1	4	5	0	3	1	0	5	4	30
17:55-18:00	0	3	1	0	4	4	0	1	1	1	3	12	30
18:00-18:05	0	0	0	0	6	4	1	1	0	0	8	10	30
Total Survey	10	63	12	16	62	96	17	66	13	15	127	120	617
PHF	.42	.7	.44	.5	.88	.7	.5	.75	.5	.58	.8	.86	.892
% Trucks	0	1.6	0	0	1.6	1	0	4.5	0	0	.8	1.7	1.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Peds	0	22	0	0	0	0	0	0	0	0	0	0	
Hourly Totals													
16:15-17:15	3	32	8	8	30	45	8	36	6	10	71	54	311
16:30-17:30	4	35	6	7	34	49	12	36	8	8	78	60	337
16:45-17:45	5	31	7	10	35	64	12	42	8	7	74	69	364
17:00-18:00	7	35	8	11	36	60	9	40	7	8	66	72	359

INTERSECTION TURN MOVEMENT COUNT PEAK HOUR REPORT
WILLAMINA ROAD AT B STREET



DATE OF COUNT: 10/21/98
DAY OF WEEK: Wed
TIME STARTED: 16:15
TIME ENDED: 18:05

TEV=TOTAL ENTRY VOLUME
T=%TRUCKS BY APPROACH
P=PHF BY APPROACH

PLAF

Peak Hour
16:45-17:45
TEV=364

Traffic Smithy
(503)641-6333

TIME PERIOD FROM - TO	EAST BOUND ↓	EAST BOUND →	EAST BOUND ↑	SOUTH BOUND ↓	SOUTH BOUND ←	SOUTH BOUND ↑	NORTH BOUND ↓	NORTH BOUND →	NORTH BOUND ↑	WEST BOUND ↓	WEST BOUND ←	WEST BOUND ↑	ALL
ALL VEHICLES													
16:45-17:00	2	7	1	1	9	16	3	10	4	1	18	16	88
17:00-17:15	0	4	4	3	10	13	1	11	0	3	18	16	83
17:15-17:30	2	11	0	3	8	12	6	8	3	0	22	18	93
17:30-17:45	1	9	2	3	8	23	2	13	1	3	16	19	100
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:45-17:00	0	0	0	0	0	0	1	0	0	0	0	1	
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	
17:15-17:30	0	0	0	0	0	0	1	0	0	0	0	1	
17:30-17:45	0	1	0	0	0	1	0	0	0	0	0	2	
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	1	1	
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	
HEAVY TRUCKS (SEMI-TRACTOR TRAILER)													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	0	0	
17:00-17:15	0	0	0	0	0	0	0	0	0	0	0	0	
17:15-17:30	0	0	0	0	0	0	0	0	0	0	0	0	
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	
BICYCLES													
16:45-17:00	0	0	0	0	0	0	0	0	0	0	2	2	
17:00-17:15	0	0	0	0	0	0	0	0	0	0	3	0	3
17:15-17:30	0	0	1	0	0	0	0	0	0	0	0	0	1
17:30-17:45	0	0	0	0	0	0	0	0	0	0	2	0	2

PEDESTRIANS	CROSSWALK USEAGE				ALL
	SOUTH	WEST	EAST	NORTH	
16:45-17:00	1	0	0	0	1
17:00-17:15	7	0	0	0	7
17:15-17:30	5	0	0	0	5
17:30-17:45	6	0	0	0	6

Peak Hour by Movement													
PHF	.63	.7	.44	.83	.88	.7	.5	.81	.5	.58	.84	.91	.91
% Trucks(all)	0	3.2	0	0	0	1.6	0	4.8	0	0	0	1.4	1.4
% Trucks(M+H)	0	0	0	0	0	0	0	0	0	0	0	1.4	.3
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	

Hourly Totals													
16:15-17:15	3	32	8	8	30	45	8	36	6	10	71	54	311
16:30-17:30	4	35	6	7	34	49	12	36	8	8	78	60	337
16:45-17:45	5	31	7	10	35	64	12	42	8	7	74	69	364
17:00-18:00	7	35	8	11	36	60	9	40	7	8	66	72	359

Planning Level Cost Estimates

Cost Estimate Assumptions													Vacant	
				Construction				ROW					Frontage	Frontage
No.	Location	From	To	Length	Width	$/SF	Contingency	Length	Width	$/SF	Contingency	Total	%	$
H-1	B Street	26th Avenue	Willamina Avenue	2600	6	10	1.25	2600	10	10	1.5	$ 585,000	0%	$ -
H-2	College Way	Pacific Avenue	21st Avenue									$ 100,000	0%	$ -
H-3	University Avenue	Sunset Drive	Main Street									$ 100,000	0%	$ -
H-4	18th Avenue	Hawthorne Street	Maple Street	3200	6	10	1.25	3200	0	10	1.25	$ 240,000	0%	$ -
H-5	Bonnie Lane Path	Gales Creek Road	Brooke Street	500	10	5	1.25	500	0	10	1.25	$ 31,250	0%	$ -
H-6	Willamina	Gales Creek Road	Main Street	4000	5	10	1.25	4000	0	10	1.25	$ 250,000	0%	$ -
H-7	Hawthorne Street	South End	Hwy. 47 Bypass	500	10	5	1.25	500	20	10	1.25	$ 156,250	0%	$ -
H-8	Cedar Street	South End	Hwy. 47 Bypass	500	10	5	1.25	500	20	10	1.25	$ 156,250	0%	$ -
H-9	19th Avenue	Hawthorne Street	Ballad Town Shops	800	6	10	1.25	800	0	10	1.25	$ 60,000	0%	$ -
H-10	23rd Avenue	Cedar Street	Hawthorne Street	1900	6	10	1.25	1900	0	10	1.25	$ 142,500	0%	$ -
H-11	Lincoln Park Trails	University Avenue	N/o 26th Avenue	3000	10	5	1.25	3000	0	10	1.25	$ 187,500	0%	$ -
												$ 2,008,750		
M-1	Sunset Drive	Hwy. 47 Bypass	24th Avenue	8000	6	10	1.25	8000	20	10	1.25	$ 2,150,000	0%	$ -
M-2	Fern Hill Road	Hwy. 47 Bypass	South city limit	2000	10	10	1.25	2000	20	10	1.25	$ 1,250,000	0%	$ -
												$ 3,400,000		
L-1	Council Creek Pathways	Martin Road	Beal Road	6000	10	10	1.25	6000	20	10	1.25	$ 2,750,000	0%	$ -
L-2	Gales Creek Pathways	Willamina Avenue	Hwy. 47 Bypass	10000	10	10	1.25	10000	20	10	1.25	$ 2,500,000	0%	$ -
												$ 5,250,000		

Cost Estimate Assumptions														
				Construction				ROW					Frontage	Frontage
Action Plan Projects		From	To	Length	Width	$/SF	Contingency	Length	Width	$/SF	Contingency	Total	%	$
H-1	19th Avenue	B Street	Ballad Town Shops	5600	1	5	1.25	0	10	10	1.5	$ 35,000	0%	$ -
H-2	Pacific Avenue	E Street	Hawthorne Street	5500	1	5	1.25	0	10	10	1.5	$ 34,375	0%	$ -
H-3	Sunset Drive	University Avenue	Hwy. 47 Bypass	5000	12	10	1.25	0	10	10	1.5	$ 750,000	0%	$ -
H-4	College Way	Pacific Avenue	University Avenue	1200	1	5	1.25	0	10	10	1.5	$ 7,500	0%	$ -
H-5	Hwy. 47 North Bypass	TV Highway	North city limit	10000	12	10	1.25	0	10	10	1.5	$ 1,500,000	50%	$ 750,000
Master Plan Projects		From	To									$ 2,326,875		
M-1	Thatcher Road	Gales Creek Road	North city limit	5000	12	10	1.25	0	10	10	1.5	$ 750,000	25%	$ 187,500
M-2	B Street (Nehalem Hwy.)	Pacific Avenue	South city limit	3000	12	10	1.25	0	10	10	1.5	$ 450,000	0%	$ -
M-3	TV Highway	Mtn. View Lane	Quince Street	2100	12	10	1.25	0	10	10	1.5	$ 315,000	0%	$ -
L-1	Pacific Avenue(Ritchey Road)	E Street	West city limit	2000	10	5	1.25	2000	10	10	1.5	$ 425,000	0%	$ -
												$ 1,940,000		

Cost Estimate Assumptions										Vacant		
	Construction				ROW					Frontage	Frontage	
	Length	Width	$/SF	Contingency	Length	Width	$/SF	Contingency	Total	%	$	Notes
23rd/24th Avenue	3800	50	10	1.2	5000	0	10	1.25	$ 2,280,000	100%	$ 2,280,000	
26th Avenue	2000	50	10	1.2	8550	0	10	1.25	1,200,000	100%	$ 1,200,000	
B Street **	800	40	10	1.2	2800	60	10	1.25	2,484,000	100%	$ 2,484,000	
College Way									200,000	0%	$ -	Road Closure
Council Street									200,000	0%	$ -	
David Hill Road **	6400	40	10	1.2	6400	60	5	1.25	5,472,000	50%	$ 2,736,000	
Forest Gale Drive	1800	40	10	1.2	1800	60	10	1.25	2,214,000	50%	$ 1,107,000	
Goff Road	2600	40	10	1.2	2600	0	10	1.25	1,248,000	100%	$ 1,248,000	
Hartford Avenue	3000	40	10	1.2	3000	0	10	1.25	1,440,000	50%	$ 720,000	
Hawthorne Street	1500	40	10	1.2	1500	0	10	1.25	720,000	100%	$ 720,000	
Heather Street	800	40	10	1.2	800	0	10	1.25	384,000	0%	$ -	
Laurel Street (Existing)	1200	20	5	1.2	1300	0	10	1.25	144,000	0%	$ -	c/g/sw
Laurel Street (New)	1300	40	10	1.2	1300	60	10	1.25	1,599,000	100%	$ 1,599,000	
Main Street	1500	40	10	1.2	1500	0	10	1.25	720,000	0%	$ -	
Main Street **	800	40	10	1.2	800	60	10	1.25	984,000	100%	$ 984,000	
Sunset Drive	4500								5,700,000	0%	$ -	MSTIP
Thatcher Road	1000	40	10	1.2	1000	60	10	1.25	1,230,000	0%	$ -	
Yew to Holladay Connector	800	50	10	1.2	800	70	10	1.25	1,180,000	100%	$ 1,180,000	
Total									$ 29,399,000		$ 16,258,000	

Public Workshop Summaries

Forest Grove Transportation System Plan
May 12, 1999 Open House
Exit Questionnaire Responses

Approximately 20 people attended an Open House on May 12, 1999 at the Forest Grove Fire Department to learn more about the City's Transportation System Plan. Attendees were asked to fill out a questionnaire that would give them the ability to convey their opinions about various transportation issues. The findings of the responses are listed below as well as the actual responses in the questionnaire format. The City of Forest Grove will use the information gathered at the open house to help them plan the spending of limited transportation funds in the 20-year Transportation System Plan.

Findings

- The majority of respondents indicated that they would like to see the roads that are currently one-way, remain one-way
- Extended bus service to Gales Creek Road is important to two respondents
- Respondents think more collector streets would ease congestion problems
- Accessibility to bike lanes and sidewalks is very important to the respondents and most liked the plan as shown at the open house
- Several respondents believe Pacific University should be responsible for creating more parking
- Developing a collector street from David Hill east to Highway 47 was a high priority for several participants

1. Future Alternatives – Review the maps relating to the future alternatives and record any comments or changes you think are necessary.

   Northwest Sector
   - Definitely develop collector from David Hill due East to Highway 47. This alternative better serves Forest Groves future development and emergency services. It allows residents to go West, East and North (3 responses)
   - Connect David Hill to 47, Watercrest to 47, Hartford Road from David Hill to 47
   - Connect Main north to Beal
   - Look at intersection of Beal to East – Resource east-bound Beal from truck route across the Council Creek Wetland and save money
   - Be sure to control speeds if B Street gets pushed out
   - The realignment of Thatcher looks good
   - Concerns about increased traffic on North B Street – Main Street is a much more improved street

   Northeast Sector
   - Plan for connections of local streets and traffic light placement now, so development later will not preclude connection

- Connect 24th and 23rd, connect 22nd Avenue from Pacific University to Masonic House, and plan for Kingwood through from 18th and 19th and Krappled from Pacific to 22nd. North south at Cedar, Poplar, Pacific, 24th, Martin, Porter, Laurel, Hawthorne

Connectivity to the bypass

- Plan for timed traffic flow from North to South by planning location if acceptable intersections. Plan for timed flow E and W on Pacific or Oak, Maple, Quince, Haggens, Mountain View
- Access to the bypass should not be limited – no lights
- Complete David Hill connections to 47 (sunset) and to Forest Gale Drive
- The Bonnie Lane connection to Gales Way Road duplicates the Willamina Avenue connection. Why the need for two?
- North City access limited to Bonnie Lane looks rough – would neighborhood route for B Street maintain the residential atmosphere?

Couplet Area (Pacific and 19th)

- Keep couplet – extension to East is desirable
- Like the 2 way with parking on one side and bike path on the other side
- Keep this area one-way with parking and a bike path on each side
- Keep one-way streets the way they are. They are easy to drive on and for business access. A two-lane street would create the need for left turns across traffic which would be difficult

2. **Bike/Pedestrian/Transit Master Plan** – Review the maps relating to these portions of the plan and record any comments or changes you think are necessary.
    - I like the plan (3 responses)
    - Network bike and pedestrian paths through all corridors with a linear park concept
    - Need more sidewalks and bike paths to get people around within town

3. **Parking** – There is a draft parking study available for review, do you have any comments on this study?
    - Improve signs to existing parking and plant some trees or make it nicer looking in some other way
    - Re-striping is essential
    - Enforce parking restrictions
    - A parking garage for Pacific University would be nice
    - Reformat time limits for parking
    - Limit long-term parking, encourage short-term parking
    - Ban students and faculty from parking in residential areas
    - Pacific University needs to build parking just as any other business would need to
    - Allow property owners a chance to provide direct input
    - Force Pacific University to go through an audit of staff, students, etc., to come up with a parking plan, and have them adhere to it

4. **Miscellaneous Comments** – Use this space to record any miscellaneous comments you have.
   - Extend bus service to the end of the city along Gales Creek (2 responses)
   - Connect Heather from Cornelius to Poplar, 24th from Yew to Cornelius Street
   - Collectors should bring traffic to the arterials and not act as arterials
   - Keep the roads one-way that are one-way
   - Mirror local street plan for Neal Armstrong area, Thatches Road area, Plant Hill area, Industrial NE area and 26th East