City of Sherwood, Oregon
ORDINANCE 2005-006

AN ORDINANCE APPROVING A PLAN MAP AND TEXT AMENDMENT, ESTABLISHING CHANGES TO CHAPTER 6 OF THE SHERWOOD COMMUNITY DEVELOPMENT PLAN COMPREHENSIVE PLAN PART 2, AMENDING THE TRANSPORTATION PLAN MAP, ADOPTING A NEW TRANSPORTATION SYSTEM PLAN, AND ESTABLISHING AN EFFECTIVE DATE.

WHEREAS, the existing Transportation Plan Update, approved through Resolution 90-473 and incorporated into the Comprehensive Plan, Part 2 by Ordinance 91-922, is outdated and a new Transportation System Plan was needed to meet the Transportation Planning Rule (OAR 660-012), the Regional Transportation Plan policies, Metro Urban Growth Management Functional Plan standards, and manage new growth expected in the next twenty years; and

WHEREAS, The City Council approved Resolution 2003-019 that authorized city staff to begin the development of a new TSP on February 25, 2003; and

WHEREAS, Chapter 6 of the Sherwood Comprehensive Plan, Part 2, and Transportation Plan Map is to be amended, and a new Transportation System Plan is required in response to a need to update the public facility element for planned transportation facilities consistent with recent and projected growth; and

WHEREAS, the Sherwood Planning Commission conducted public hearings on the proposed plan map and text amendment, referred to as File No. PA 04-03, on November 1 & 16th, January 4th, and February 15th, held work sessions open to the public on October 5, December 7th & February 1st, and held open houses on May 5, 2004 and February 1st and 14th 2005, and recommended approval of the plan map and text amendment to the City Council on February 15, 2005; and

WHEREAS, the Sherwood City Council conducted public hearings on the proposed plan map and text amendment on March 1st and15th; and

WHEREAS, the Community Development and Zoning Code Section 4.203.01 & 4.203.02 specifies the criteria to approve a change to the Comprehensive Plan Map and Text, and that the Sherwood City Council finds that the proposal complies based on the findings of fact recommended by the Planning Commission; and

WHEREAS, the Sherwood City Council has received the application materials, the City's Planning Staff report (PA 04-03), supporting documents, Transportation System Plan April 2005, the Planning Commission findings, and the Council reviewed the materials submitted, and the findings of fact of the proposal, and conducted public hearings.

NOW, THEREFORE, THE CITY ORDAINS AS FOLLOWS:

Section 1. Commission Review & Public Hearings. That the application for a Plan Map & Text Amendment (File No. PA 04-03) to amend the Transportation Plan Map and Chapter 6 of the Comprehensive Plan (Part 2), and adoption of a Transportation System Plan as a technical appendix to the Comprehensive Plan (Part 2) was subject to full and proper review, and public hearings were held before the Planning Commission on November 1 & 16th, January 4th, and February 15th and the City Council on March 1st and15th.

Section 2. Findings. That after full and due consideration of the application, multiple City Staff reports, the record, findings, and of the evidence presented at the public hearings, the Council finds that the proposed plan map and text amendments are appropriate to revise the Sherwood Community Development Plan and Comprehensive Plan & Map; and adopt a new TSP consistent with state law, and therefore, the Council adopts the findings of fact contained in the staff reports and recommendation from Planning Commission dated February 22, 2005, and amended by the Council findings as stipulated in the Notice of Decision "Exhibit A".

Section 3. Approval. That a request for a Plan Map & Text Amendment is hereby **APPROVED** as stipulated in the Notice of Decision dated March 15, 2005; labeled "Exhibit A", and such amendments constitute changes to Chapter 6 "Exhibit C", Transportation Plan Map "Exhibit C", and Transportation System Plan March 2005 "Exhibit B" attached to this ordinance.

Section 4. Manager Authorized. The Planning Supervisor is hereby directed to take such action as may be necessary to document this amendment.

Section 5. Effective Date. This ordinance shall become effective the 30th day after its adoption by the City Council.

Duly passed by the City Council this 15th day of March, 2005.

Approved by the Mayor this 15th day of March, 2005.

Keith S. Mays, Mayor

Attest:

C.L. Wiley, City Recorder

	AYE	NAY
Luman	✓	
King	✓	
Henderson	✓	
Heironimus	abstain	
Grant	✓	
Durrell	✓	
Mays	✓	

EXHIBIT "A"
ORDINANCE 2005-006

CITY COUNCIL
NOTICE OF DECISION

City of Sherwood **March 7, 2005**

STAFF REPORT: File No: PA 04-03 - Transportation System Plan

To: **City Council**
From: **Kevin A. Cronin, AICP**
Planning Supervisor

Re: **PA 04-03 Transportation System Plan initiated by the Planning Commission on October 5, 2004.**

Signed: K A C
Kevin A. Cronin, AICP, Planning Supervisor

I. BACKGROUND

A. Public Involvement

The following work sessions, open houses, and public hearings for a new Transportation System Plan (TSP) were advertised and held as described below. Individual electronic notice was sent to those requesting notice on October 26, December 7, 2004, and January 12 & 27. Finally mailed notice was sent to those on record when the public hearing originally continued to March 15 was rescheduled for February 15.

Transportation System Plan Meetings

Date	Meeting Type	Audience
May 6	Open House & Work Session	General Public & Planning Commission
October 5	Work Session	Planning Commission
November 2	Public Hearing	Planning Commission
November 16	Public Hearing	Planning Commission
December 7	Work Session	Planning Commission
January 4	Public Hearing	Planning Commission
February 1	Open House & Work Session	General Public & Planning Commission
February 14	Open House	General Public
February 15	Public Hearing	Planning Commission
March 1	Public Hearing	City Council
March 15	Public Hearing	City Council

In addition to general public involvement, the city established a Technical Advisory Committee (TAC) consisting of various transportation-related agencies. In 2003 and 2004 the TAC met periodically to review consultant findings and drafts of the TSP. Finally, the consultant created a comment log to document public comments, and actions taken in response to comments, throughout the planning process.

B. Proposal

PA 04-03 Transportation System Plan (Exhibit A) replaces the existing TSP adopted in 1991 and referenced in the Sherwood Comprehensive Plan Part 2, Chapter 6. In addition, new plan policy goals, strategies, and maps will replace Chapter 6. (Exhibit B)

The purpose of the plan amendment is to update the existing transportation infrastructure inventory, plan for new capital improvements for the next twenty year planning period as required by Goal 12 of the statewide land use planning program, the Transportation Planning Rule (OAR 660-012), and Regional Transportation Plan, and provide a technical resource for policy-making, capital financing, and land use decisions. The TSP includes the following chapters:

Chapter	Title
1	Summary
2	Goals & Policies
3	Existing Conditions
4	Future Demand and Land Use
5	Pedestrian Plan
6	Bicycle Plan
7	Transit
8	Motor Vehicles:
9	Other Modes
10	Financing & Implementation

The required findings will reference the proposed policies in the TSP and the applicable criteria in the City of Sherwood Comprehensive Plan Part 2 & Part 3 with *italics*.

II. REQUIRED FINDINGS FOR A PLAN TEXT AMENDMENT

The City shall find that the following criterion is met by the proposed amendment:

Section 4.203.01 Text Amendment Review Criteria

"*An amendment to the text of the Comprehensive Plan shall be based upon the need for such an amendment as identified by the Council or the Commission. Such an amendment shall be consistent with the intent of the Comprehensive Plan, and with all other provisions of the Plan and Code, and with any applicable State or City statutes and regulations.*"

A. The City of Sherwood has not significantly amended the TSP since it was adopted in 1991. As a result of the demand for new housing and services, and subsequent increase in residential and employment population, the City determined a new TSP was necessary to adequately manage future growth.

B. Based on a draft TSP dated October 2004, various technical reports prepared for the City of Sherwood by DKS Associates, the City of Sherwood has determined that there is a lack of new streets that are connected or planned, a limited number of capital street improvements planned and financed, land use policies that need to be balanced among various modes to reduce or mitigate increases in vehicle miles traveled, and meet new requirements of the Regional Transportation Plan and maintain LOS "D" for capacity.

C. The City finds that in order to prevent failure of local and collector streets in the next 20 years, to preserve capacity for all new development within the Sherwood Urban Growth Boundary, to preserve land values, and to assure capital improvements are made commensurate with the impact of development, there is a need for a new "Transportation System Plan" The City finds that the new TSP meets the policy objectives of a multi-modal system that adequately serves current and future development without causing failure of the transportation system.

D. The City finds that the proposed TSP complies with existing Comprehensive Plan Part 2, Chapter 6 - Transportation Element policies as follows:

The plan will be periodically updated to assure consistency with changing ideas and philosophies.

> *Evaluate regional land use changes and analyze migration to maintain an effective roadway network and plan to meet system demands.*
> *Street segment and intersection capacity and level of service need to be continually analyzed and evaluated in order to respond to changing conditions and to take corrective measures. (Policy 1, page 25)*

The City finds that the rapid rate of development and land use changes in Sherwood has resulted in a congested transportation system, and that consequently reduces the movement of goods and services, economic development opportunities, and jeopardizes the quality of life and emergency response to residents and businesses. The City finds that a new "Transportation System Plan" is an appropriate measure.

The transportation system shall be periodically evaluated to determine the need for improvements. (Policy 1, page 22)

The City was well aware that it needed to update the TSP. The City tried unsuccessfully on four different attempts to update the TSP from 1997-2002. The City began the current planning process in 2003. To this end the city developed a technical advisory committee to review drafts of the proposed plan. Various technical reports produced for each chapter were provided to the TAC and Planning Commission acting as the advisory committee.

The first draft TSP was released to the public in March 2004. A second, hearing ready draft was prepared for October 2004. The City finds that the new TSP meets this policy.

Adopt requirements for potential development that will mitigate the traffic impacts. (Policy 2, page 18)

The City finds that the proposed TSP provides a map and plan policy framework that requires new development and capital improvements in a fair and objective method to assure it can occur while requiring mitigation of traffic impacts commensurate with the number of trips their development generates. The Capacity Allocation Program addresses improvements along Highway 99W while the development code will be amended to ensure new development mitigates increases in traffic proportional to the impact.

Coordinate the network with adjacent governmental agencies, the County, Metro, and the State. Coordinate with ODOT in implementing their Six Year Plan and Highway Improvement Program. (Policy 1, page 7)

The proposed TSP includes goal and policy statement that are consistent with the above criterion (Goal 2, Policy 6). To this end, the City has worked closely with various affected agencies via a Technical Advisory Committee (TAC), which includes ODOT, Tri-Met, Metro, Tualatin Valley Fire & Rescue, City of Tualatin, and Washington County with the common goal to provide the most efficient and safe transportation system for Sherwood. The City finds there is a great need to develop a better transportation system in view of continued rapid growth and maintain a quality of life that Sherwood values. To accomplish this goal the transportation network needs to be coordinated with all affected agencies. City staff has solicited comments from the TAC and entered all comments into the public record. Finally, DLCD has also been noticed and provided informal comments to the City.

E. The City finds that the proposed TSP complies with applicable requirements of the state Transportation Planning Rule (TPR) (OAR 660-12):

0020: Elements of a Transportation System Plan

A TSP shall establish a coordinated network of transportation facilities adequate to serve state, regional and local transportation needs.

The proposed TSP follows a sequential order set out by the TPR. This includes a policy framework and strategies for implementing the TSP, inventory and assessment of existing conditions, master plans and maps per transportation facility based on a population and employment projection and land use demand forecast, alternative measures to meet reduction in VMT, and capital financing. After reviewing the October 2004 draft the City finds it meets the required elements of a TSP. Standard is met.

0030: Determination of Transportation Needs

The TSP shall identify transportation needs relevant to the planning area and the scale of the transportation network being planned including:
(a) State, regional, and local transportation needs;

The proposed TSP evaluated all existing transportation infrastructure, regardless of ownership, based on the needs of a growing population, and compared the inventory with projected demand for land use, including residential, commercial, and light industrial zoning designations. In addition, the City reviewed the Oregon Highway Plan (OHP) and Regional Transportation Plan (RTP) to meet this standard (Chapter 3&4). Based on a coordinated population, per ORS 195.036, the City finds that the TSP meets this criterion.

(b) Needs of the transportation disadvantaged;

The proposed TSP identified the needs of transportation disadvantaged and developed long range plans to improve the pedestrian, bicycle, and transit network. In addition to capital improvements the City developed program policy goals to assist the underserved population. (Chapter 2, Goal 1, Policy 7)

(c) Needs for movement of goods and services to support industrial and commercial development planned for pursuant to OAR 660-009 and Goal 9 (Economic Development).

The proposed TSP evaluated the needs of commercial and light industrial lands and has a proposed policy statement (Chapter 2, Goal 7) in support of this employment base. In response, new streets and facilities have been identified in the light industrial districts. However, the City still needs to update the Economic Development element of the Sherwood Comprehensive Plan to determine new target industries and site suitability. A new economic opportunities analysis and strategy will include proposed amendments to the TSP if necessary.

(3) Within urban growth boundaries, the determination of local and regional transportation needs shall be based upon:
(a) Population and employment forecasts and distributions which are consistent with the acknowledged comprehensive plan, including those policies which implement Goal 14, including Goal 14's requirement to encourage urban development on urban lands prior to conversion of urbanizable lands. Forecasts and distributions shall be for 20 years and, if desired, for longer periods;

The proposed TSP identified transportation analysis zones (TAZ) throughout the Sherwood UGB to determine traffic needs and impacts to those identified areas. Each area has a corresponding population and employment forecast based on existing and planned land use. In addition, Metro identified and included new areas for future urbanization. Forecasts for each area are based on a twenty year planning period. Standard is met.

(b) Measures adopted pursuant to OAR 660-012-0045 to encourage reduced reliance on the automobile.

Policies and implementation strategies to reduce reliance on the automobile are found throughout the proposed TSP. Examples include, but are not limited to, transportation demand management, Safe Routes to School program, and mapped improvements to the pedestrian, bicycle, and transit network.

(4) In MPO areas, calculation of local and regional transportation needs also shall be based upon accomplishment of the requirement in OAR 660-012-0035(4) to reduce reliance on the automobile.

See Section 0035 below.

0035: Evaluation and Selection of Transportation System Alternatives

(1) The TSP shall be based upon evaluation of potential impacts of system alternatives that can reasonably be expected to meet the identified transportation needs in a safe manner and at a reasonable cost with available technology.

2) Local governments in MPO areas of larger than 1,000,000 population shall, and other governments may also, evaluate alternative land use designations, densities, and design standards to meet local and regional transportation needs. Local governments preparing such a strategy shall consider:
(a) Increasing residential densities and establishing minimum residential densities within one quarter mile of transit lines, major regional employment areas, and major regional retail shopping areas;

The City of Sherwood has carefully considered the relationship of development potential and Metro 2040 Growth Concept in evaluating transportation needs and land use scenarios. A large part of the strategy considers transit service to reach the goal of a mixed-use town center. Tri-Met has three bus lines that provide service to Sherwood. Two of the bus lines are limited to peak hour commuter service to and from downtown Portland. The City has designated higher density areas along these routes in the Sherwood Plan and Zone Map to support increased levels of service. Future rail options in the RTP have a bus rapid transit line along Highway 99W to King City. An extension to Sherwood would be more likely beyond the 20 year planning period. More likely is a connection to a commuter rail line running through Washington County. The City endorses both options. Furthermore, the existing Six Corners area is designated as a town center in the Metro 2040 Growth Concept Map, which requires higher densities to support transit. This area is built out and is not a candidate for redevelopment. A new town center designation is proposed in Old Town that replaces the original Six Corners area. The Old Town area offers a better option that supports the goals of the town center concept: new civic facilities, tax increment financing tools, density targets, design consistency and certainty, and infill and redevelopment capacity. Furthermore, the Old Town area (original central business district) encourages mixed-use through existing zoning tools such as flexibility of uses and no parking requirements. City sponsored and private development projects recently approved in the Old Town area are indicative of a viable town center and will only improve with a commuter rail line.

(b) Increasing allowed densities in new commercial office and retail developments in designated community centers;

The Six Corners area, as a major crossroads in Washington County, has an enormous amount of built commercial space. County roads and Highway 99 converge to create a "power center" of retail activity. Infill of residential and new commercial is *allowed* in Six Corners and Old Town subject to meeting performance standards. For example, Hunters Ridge is a new mixed-use development that offers ground floor retail and condominium apartments above using underground and shared parking for three separate buildings. The City finds that this standard is met.

(c) Designating lands for neighborhood shopping centers within convenient walking and cycling distance of residential areas.

Most of the commercial activity convenient from residential neighborhoods is found in the Old Town area. Residents can easily walk or bike to Old Town using connected local streets and accessible multi-use paths. In addition, the west side neighborhoods can access Six Corners through sidewalks and multi-use paths. New Urban Study Area 54-55 (Brookman Road) concept plan may include a neighborhood activity center (NAC) as well. A majority of neighborhoods are built out and are not likely candidates for neighborhood commercial services. However, a new strategy is included to study the feasibility of future NACs to support neighborhood-oriented commercial services within walking and biking distance (Chapter 2, Goal 1, Strategy 4).

0060: Plan and Land Use Regulation Amendments

(1) Amendments to functional plans, acknowledged comprehensive plans, and land use regulations which significantly affect a transportation facility shall assure that allowed land uses are consistent with the identified function, capacity, and performance standards (e.g. level of service, volume to capacity ratio, etc.) of the facility. This shall be accomplished by either:
(a) Limiting allowed land uses to be consistent with the planned function, capacity, and performance standards of the transportation facility;

The proposed TSP maintains a LOS "D" for planned facilities. The CAP program was adopted to effectively manage increases in vehicle trips above a threshold LOS "E" for Highway 99W. The TSP does not propose a different LOS or v/c ratio for other areas, nor are there any proposed changes to zone map designations, which would increase VMT. Standard is met.

(b) Amending the TSP to provide transportation facilities adequate to support the proposed land uses consistent with the requirements of this division;

The proposed TSP inventories current facilities, measures existing conditions, and plans for future facilities based on improvements in connectivity to the existing transportation network. Generally, additional capacity (widening from 3 to 5 lanes) is only planned for Tualatin-Sherwood Road. Standard is met.

(c) Altering land use designations, densities, or design requirements to reduce demand for automobile travel and meet travel needs through other modes; or

The proposed TSP provides a policy framework for encouraging alternative modes of travel and identifies code amendments necessary to implement the policy goals and strategies. The proposal does not alter zoning designations or allowed densities, but clarifies policy direction and proposes code amendments to support alternative modes, which is consistent with Metro 2040 Growth Concept, Functional Plan, and the RTP.

(d) Amending the TSP to modify the planned function, capacity and performance standards, as needed, to accept greater motor vehicle congestion to promote mixed use, pedestrian friendly development where multimodal travel choices are provided.

The proposed TSP significantly amends the existing street classifications because the RTP has different street classifications for similar functions. The new TSP is based on the principle of connectivity and not on the amount of traffic (capacity). The land use drives the connectivity standard instead of the transportation facility dictating the level of service. The proposed TSP also clarifies the multi-modal purpose and function of arterials, collectors, and local streets consistent with the RTP and connectivity principle. Chapter 8 includes a goal to maintain a LOS "D" for capacity and operations within the 20-year planning period. Capital improvements, including minimal capacity increases, are planned to maintain LOS "D".

(2) A plan or land use regulation amendment significantly affects a transportation facility if it: (a) Changes the functional classification of an existing or planned transportation facility;

As discussed above the proposed TSP does change functional classification names consistent with the RTP, but does not change the underlying function other than focusing on connectivity instead of traffic volume. For example, Sherwood Road that connects the Old Town street network to Highway 99 was designated a minor arterial, but it is now designated an arterial because it provides a crucial link between two commercial business districts. Another example is the Pine Street realignment as part of the adopted Downtown Streetscape Plan that will elevate the classification from minor collector to collector. Both streets will include multi-modal options.

(b) Changes standards implementing a functional classification system;

The standards for implementing the TSP and functional classification are different than the original TSP. The City carefully considered the new approach and found a lack of connectivity of the existing street network and need for planned facility improvements to meet future demand required amendments to the TSP. The new transportation system is focused on connectivity, developing alternative modes, and an outcomes-based approach to alleviating poor traffic conditions by reinvesting improvements to the existing system, including Adams Road and downtown street network.

(c) Allows types or levels of land uses which would result in levels of travel or access which are inconsistent with the functional classification of a transportation facility; or

The proposed TSP does not change planned land uses or zoning designations. It allows future development to be consistent with planned functional classification and limits access to the lowest classification available adjacent to private property. Levels of travel will be maintained at LOS "D".

(d) Would reduce the performance standards of the facility below the minimum acceptable level identified in the TSP.

The proposed TSP does not change the performance standards of a facility below a minimum acceptable LOS "D" within the 20-year planning period.

F. Statewide Planning Goals

Goal 1: Citizen Involvement

The City established a Technical Advisory Committee, held various meetings with the Planning Commission, which was the designated advisory committee, and scheduled an open house and two public hearings to receive comments and testimony. A summary of public meetings is listed under the "Background" section of this staff report. Finally, a comment log was produced to document written and oral testimony.

Goal 2: Land Use Planning

The TSP analyzed land use designations, projected population, and future demand of land uses based on housing and employment projections. The TSP also addresses planned streets and connections to areas that were recently added to the UGB, but does not designate new facilities outside the UGB.

Goal 3: Agriculture

This goal does not apply.

Goal 4: Forestry

This goal does not apply.

Goal 5: Natural Resources

Planned streets and facilities are not site specific. Future facilities will need to address local and regional Goal 5 significant resources. Impacts to inventoried Goal 5 resources will be minimized if impacts are determined to be necessary for the function and operation of the transportation system.

Goal 6: Air and Water Quality

Sherwood is located in the Portland Metropolitan Air Quality Management Attainment Area. The proposed TSP encourages alternative modes and transportation demand management, such as the DEQ ECO Rule, to reduce reliance on the automobile and improve air quality.

Goal 7: Natural Hazards

This goal does not apply.

Goal 8: Recreation

Sherwood has a system of multi-use paths and the proposed TSP identifies future facility improvements to continue the development of an interconnected system of local and regional paths to promote walking and bicycling.

Goal 9: Economic Development

The proposed TSP addresses new facilities for light industrial areas of the city. However, the City needs a new economic opportunities analysis (EOA) that identifies target industries and their needs. A condition of approval addresses compliance with this goal.

Goal 10: Housing

The proposed TSP addresses street connections between existing and planned residential developments. Higher density areas are identified along corridors to support mixed housing types and transit.

Goal 11: Public Facilities

The TSP is a public facility plan and is addressed below under Goal 12.

Goal 12: Transportation

The proposed TSP implements Goal 12, addresses TPR standards, as well as the Regional Transportation Plan. This staff report used TPR standards as criteria to make findings of act and demonstrate compliance.

Goal 13: Energy Conservation

The proposed TSP promotes alternative modes of travel to reduce reliance on the automobile and therefore conserves the use of energy resources.

Goal 14: Urbanization

The proposed TSP addresses the need for new facilities for new urban areas brought into the UGB in 2002. The proposed TSP does not identify new streets outside the UGB. Washington County will own, operate, or administer land use and transportation needs and facilities outside the UGB. An Intergovernmental Agreement (IGA) is proposed between the City and Washington County to better manage transportation services, ownership transfer, and coordinate capital improvements.

Section 4.203.02 Map Amendment Review Criteria

An amendment to the City Zoning Map may be granted, provided that the proposal satisfies all applicable requirements of the Comprehensive Plan and this Code, and that:

A. The proposed amendment is consistent with the goals and policies of the Comprehensive Plan.

The request is to update Transportation Plan Map in the Comprehensive Plan, which is an inventory required as part of a state mandated public facility plan map. New maps that illustrate planned transportation facilities and functional class are also included in the update. The new TSP was evaluated using the existing Transportation Element as a measurement of compliance, proposes new policies and implementation strategies consistent with regional and state policy, and does not propose any new zoning designations. Based on the above analysis and findings, the standard is met.

B. There is an existing and demonstrable need for the particular uses and zoning proposed, taking into account the importance of such uses to the economy of the City, the existing market demand for any goods or services which such uses will provide, the presence or absence and location of other such uses or similar uses in the area, and the general public good.

The proposed TSP does not propose changes in use or zones. The proposed Comprehensive Plan Map amendment updates inventories and plans future facilities to better serve residents and businesses. It also clarifies policy goals and objectives for the design types that are encouraged to support alternative modes. Standard is met.

C. The proposed amendment is timely, considering the pattern of development in the area, surrounding land uses, any changes which may have occurred in the neighborhood or community to warrant the proposed amendment, and the availability of utilities and services to serve all potential uses in the proposed zoning district.

Clearly, the proposed TSP is timely given the last update was completed in 1991 and the population increased by 12,000 new residents over the last fifteen years. The proposal outlines the need for transportation facilities and plans for improvements over a twenty year period to meet demand and serve businesses and residents more effectively and efficiently given available funding and resources. Standard is met.

D. Other lands in the City already zoned for the proposed uses are either unavailable or unsuitable for immediate development due to location, size or other factors.
The request does not change the underlying zones. This criterion does not apply.

III. PLANNING COMMISSION RECOMMENDATION

On February 15, 2005 the Planning Commission held its fourth public hearing to receive and evaluate oral and written testimony. Almost all of the testimony focused on the W. Villa Road connection to Old Town. Despite staff's recommendation based on technical merits of improved system wide circulation, connectivity, potential increase in business to Old Town, and faster emergency response, the residents testifying against raised issues of neighborhood livability (increased traffic, safety, and environmental impacts to wetlands). Although the Planning Commission acknowledged the mistake of not having a connection when Woodhaven was originally developed, retrofitting it with a connection is problematic to the neighborhood and cited the $2.9 M projected cost as a factor in their recommendation to remove this connection.

The cost factor, when compared to the actual transportation benefit, was also cited by the Commission as a reason to remove recently constructed portions of Sherwood Boulevard and Sunset Boulevard as designated streets for future bike facilities where none exist. This recommendation presents a problem because both roads are classified as an arterial. According to the Transportation Planning Rule (OAR 660-012-0045 (3)(b)(B) Implementation of the Transportation System Plan) *Bikeways shall be required along arterials and major collectors.* "Bikeways" is an all inclusive term for bike facilities, such as off-street paths and on-street lanes. Staff does not recommend removal of the bike facility designation because it would violate state law. Staff recommends inclusion of the designation as illustrated in the October 2004 Draft that meets state law and allows future planning and development options of a bike facility that fits the conditions of the street. For example, as part of a larger transportation project the city would evaluate the feasibility of a designated multi-use path or shared roadway (signed bike route) that could provide safe and convenient access and would be shared with pedestrians. Although this option may require additional right-of-way it would not require a new bike lane.

The following summarizes the Planning Commission's recommendation as a result of the testimony:

- Removal of West Villa Road connection to Old Town (2^{nd} & Park) as illustrated on Figure 8-1 & 8-8;
- Change of bike facility designations on recently rebuilt portions of Sunset Blvd and Sherwood Blvd from "Action Plan" to "Master Plan" status, which effectively downgrades the funding priority; and
- Addition of special assessments and employee (payroll) tax as finance options, expansion of discussion on gas tax, and an appeal provision within the text that discusses the utility fee assessment per land use (Chapter 10);

City Council Discussion

On March 1 the City Council held a work session and public hearing on the TSP. During the work session some important issues were raised regarding the West Villa Road connection. First, emergency response times and expected levels of service was broached because staff argues the response time would be improved. Paul Lesage, Assistant Fire Chief with Tualatin Valley Fire & Rescue (TVF&R), provided insight into the emergency response equation. According to TVF&R a new fire station is not expected because the capital cost is \$2.5M and annual operating cost is \$1.5 M, which far outweighs the one-time capital cost for W. Villa Road. If the existing station experiences an increase in call activity, this facility will be expanded to address unmet needs. TVF&R has a five minute goal for emergency response as part of a risk analysis. TVF&R is able to respond to 86% of calls within six minutes. TVF&R prefers to improve the transportation network compared to a new facility to improve response times.

At Council's request Police Chief Middleton directed a patrol officer to test the emergency response time for Woodhaven. The results indicate a significant improvement of at least 2 to 3 minutes based on a direct route from the TVF&R fire station through Stella Olsen Park. (Refer to Exhibit D)

Regarding the I-5/99W Connector and the long range traffic analysis in the TSP, DKS did not incorporate this project into its long range traffic planning. A staff level decision was made early on in the process to not assume this project in the 20 year planning period because (1) it's under County jurisdiction and the City's TSP is a public facility element for city projects, (2) there is no land use approval or funding source identified, and (3) a decision on which alignment (north or south) had not been reached. If the I-5/99W Connector is approved by Metro and the County, then the City will need to reevaluate the impacts to the transportation system and amend the TSP accordingly. Changes have been made to the TSP (Chapter 8) to reflect this discussion and rationale.

IV. STAFF RECOMMENDATION

In addition to the above amendments recommended by the Planning Commission, staff recommends adoption of the following conditions of approval:

1. Replace references to the existing 1990 Transportation Plan Update (Resolution 90-473) that were incorporated into the Sherwood Community Plan, Part 2, Chapter 6 (Ordinance 91-922) with the new TSP and implementing ordinance codifying the provisions. The new TSP is a plan amendment to the original 1981 Comprehensive Plan.

2. Delete outdated policies and replace with new policy goals, objectives, and strategies in the Sherwood Comprehensive Plan Part 2, Chapter 6 (Exhibit C).

3. Replace all existing transportation plan maps with new maps contained in the TSP and clearly mark with new adoption dates.

4. Upon Council approval send a "Notice of Adoption" to DLCD within five calendar days and a Notice of Decision to interested parties who requested such.

5. Direct staff to replace existing copies of 1990 Transportation Plan with new TSP, upload an electronic version of adopted TSP to the city website, and provide a new copy to the Sherwood Library for reference.

6. After a new Economic Development Element is adopted, evaluate the TSP and propose amendments to improve conditions to site target industries.

7. Subsequent to adoption of the TSP, commence the development, review, and adoption of new amendments to the City of Sherwood Community Plan and Development Code that implement the new policy goals and strategies.

Exhibits:

B: Transportation System Plan, March 2005

C: Comprehensive Plan Part 2, Chapter 6 – Transportation Element, February 21, 2005; Edited Version with Recommendations from Planning Commission.

D. Memo: Response Times, Police Chief Middleton, dated March 4, 2005.

"Exhibit C"

TRANSPORTATION

A. INTRODUCTION

The purpose of the Transportation element of the Comprehensive Plan is to describe a multi-modal system which will serve the future transportation needs of Sherwood. The plan for the future transportation system should be capable of effective implementation, responsive to changing conditions and be consistent with plans of adjoining jurisdictions. The Plan seeks to foresee specific transportation needs and to respond to those needs as growth occurs. The original Transportation Network Plan was created in 1979. The original transportation policy element was created in 1980 as part of the first Comprehensive Plan acknowledged by the Oregon Department of Land Conservation and Development. The plan policies were updated in 1989 and a new Transportation Plan Update was completed in 1991. The most recent Transportation element has been revised substantially to reflect changes in a new Transportation System Plan (TSP) begun in 2003 and completed in March 2005. The newest TSP is attached as an appendix and technical reference to this Comprehensive Plan, including an analysis of the existing transportation system, changes to the functional classification of streets, an update of various inventory and plan maps, and changes to the street design standards.

NOTE: The following types of capital facilities are not present within the City: 1) air transportation, and 2) water transportation. Therefore, they are not addressed in this plan.

B. GOALS, POLICIES, AND STRATEGIES

Goal 1: Provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes serving all neighborhoods and businesses.

Policy 1 – The City will ensure that public roads and streets are planned to provide safe, convenient, efficient and economic movement of persons, goods and services between and within the major land use activities. Existing rights of way shall be classified and improved and new streets built based on the type, origin, destination and volume of current and future traffic.

Policy 2 – Through traffic shall be provided with routes that do not congest local streets and impact residential areas. Outside traffic destined for Sherwood business and industrial areas shall have convenient and efficient access to commercial and industrial areas without the need to use residential streets.

Policy 3 – Local traffic routes within Sherwood shall be planned to provide convenient circulation between home, school, work, recreation and shopping. Convenient access to major out-of-town routes shall be provided from all areas of the city.

Policy 4 – The City shall encourage the use of more energy-efficient and environmentally-sound alternatives to the automobile by:

- The designation and construction of bike paths and pedestrian ways;
- The scheduling and routing of existing mass transit systems and the development of new systems to meet local resident needs; and
- Encouraging the development of self-contained neighborhoods,

providing a wide range of land use activities within a single area.

Policy 6 – The City shall work to ensure the transportation system is developed in a manner consistent with state and federal standards for the protection of air, land and water quality, including the State Implementation Plan for complying with the Clean Air Act and the Clean Water Act.
Policy 7 – The City of Sherwood shall foster transportation services to the transportation-disadvantaged including the young, elderly, handicapped, and poor.
Policy 8 – The City of Sherwood shall consider infrastructure improvements with the least impact to the environment.
Policy 9 – The City of Sherwood shall develop a transportation demand management program to complement investments in infrastructure (supply).

Strategies

1. Make traffic safety a continuing effort through effective law enforcement and educational programs.
2. Adopt an acceptable level of service for the roadway network that is consistent with regional transportation policies.
3. Develop an array of transportation assets and services to meet the needs of the transportation-disadvantaged.
4. Evaluate, identify, and map existing and future neighborhoods for potential small scale commercial businesses to primarily serve local residents.
5. Adopt a strategy for reducing impacts of impervious surfaces to stormwater management.
6. Identify and adopt a transportation demand management strategy to provide incentives to employers who develop transportation options for employees.

Goal 2: Develop a transportation system that is consistent with the City's adopted comprehensive land use plan and with the adopted plans of state, local, and regional jurisdictions.

Policy 1 – The City shall implement the transportation plan based on the functional classification of streets shown in Table 8-1.
Policy 2 – The City shall maintain a transportation plan map that shows the functional classification of all streets within the Sherwood urban growth area. Changes to the functional classification of streets must be approved through an amendment to the Sherwood Comprehensive Plan, Part 2, Chapter 6 - Transportation Element.
Policy 3 – The Sherwood transportation system plan shall be consistent with the city's adopted land use plan and with transportation plans and policies of other

local jurisdictions, especially Washington County, Clackamas County, City of Wilsonville, and the City of Tualatin.

Policy 4 – The City will coordinate with Metro regarding implementation of the Regional Transportation Plan and related transportation sections of the Metro Functional Plan.

Policy 5 – The City shall adopt a street classification system that is compatible with Washington County Functional Classification System for areas inside the Washington County Urban Area Plan and with Washington County 2020 Transportation Plan (Ordinance 588).

Policy 6 — The City will work with Metro and other regional transportation partners to implement regional transportation demand management programs where appropriate.

Policy 7 — The City shall work cooperatively with the Port of Portland and local governments in the region to ensure sufficient air and marine passenger access for Sherwood residents.

Policy 8 - Establish local non-Single Occupant Vehicle (SOV) modal targets, subject to new data and methodology made available to local governments, for all relevant design types identified in the RTP. Targets must meet or exceed the regional modal targets for the 2040 Growth Concept land use design types as illustrated in the following table:

2040 Regional Modal Targets
Non-single Occupancy Vehicles

2040 Design Type	Modal Target
Regional centers Town centers Main streets Station communities Corridors	45 to 55 percent
Industrial areas Employment areas Inner neighborhoods Outer neighborhoods	40 to 45 percent

Strategies

1. Develop an intergovernmental agreement between Sherwood, Washington County and the City of Tualatin, consistent with ORS 195.065, to establish urban service boundaries and responsibilities for transportation facilities within and adjacent to the City of Sherwood.
2. Work cooperatively with ODOT, Washington County, and Metro to

develop an interchange area management plan for the Pacific Highway 99-W and Tualatin-Sherwood Highway intersection.

3. Work cooperatively with ODOT, Metro, Washington County, and Tualatin to develop a corridor management plan for Pacific Highway 99W and Tualatin-Sherwood Road to preserve existing access to the highway for the city's arterial and collector streets.
4. Participate in regional planning efforts, including the development of the Regional Transportation Plan (RTP), to secure funding for safety and capacity improvements to the City of Sherwood's arterial and collector street system that are necessary to maintain acceptable levels of service for local and through traffic.
5. Define transportation corridors in advance through long range planning efforts
6. Coordinate the transportation network with adjacent governmental agencies, such as Washington County, Metro, and the State. Coordinate with ODOT in implementing their Six-Year Plan and the State Highway Improvement Program.

Goal 3: Establish a clear and objective set of transportation design and development regulations that addresses all elements of the city transportation system and that promote access to and utilization of a multi-modal transportation system.

Policy 1 – The City of Sherwood shall adopt requirements for land development that mitigate the adverse traffic impacts and ensure all new development contributes a fair share toward on-site and off-site transportation system improvement remedies.
Policy 2 – The City of Sherwood shall require dedication of land for future streets when development is approved. The property developer shall be required to make full street improvements for their portion of the street commensurate with the proportional benefit that the improvement provides the development.
Policy 3 – The City of Sherwood shall require applicable developments (as defined in the development code), to prepare a traffic impact analysis.
Policy 4 – The City of Sherwood shall adopt a uniform set of design guidelines that provide one or more typical cross section associated with each functional street classification. For example, the City may allow for a standard roadway cross-section and a boulevard cross-section for arterial and collector streets.
Policy 5 – The City shall adopt roadway design guidelines and standards that ensure sufficient right-of-way is provided for necessary roadway, bikeway, and pedestrian improvements.
Policy 6 – The City shall adopt roadway design guidelines and standards that ensure sidewalks and bikeways be provided on all arterial and collector streets for the safe and efficient movement of pedestrians and bicyclists between residential areas, schools, employment, commercial and recreational areas.

Policy 7 – The City of Sherwood will generally favor granting property access from the street with the lowest functional classification, including alleys. Additional access to arterials and collectors for single family units shall be prohibited and use access from frontage roads and local streets. Frontage roads shall be designed as local streets.
Policy 8: The City will adopt access control and spacing standards for all arterial and collector streets to improve safety and promote efficient through street movement. Access control measures shall be generally consistent with Washington County access guidelines to ensure consistency on city and county roads.
Policy 9 - The City will establish guidelines and standards for the use of medians and islands for regulating access and providing pedestrian refuge on arterial and collector streets.
Policy 10 – The City of Sherwood will establish a set of guidelines and standards for traffic calming measures to retrofit existing streets and as part of land use review.
Policy 11 - The City will develop uniform traffic control device standards (signs, signals, and pavement markings) and uniformly apply them throughout the city.
Policy 12 - The City of Sherwood will adopt parking control regulations for streets as needed. On-street parking shall not be permitted on any street designated as an arterial, unless allowed by special provision within the Town Center (Old Town) area or through the road modifications process outlined in the Sherwood Development Code.
Policy 13 – The City of Sherwood shall adopt new development codes to fill in gaps in existing sidewalks to achieve a consistent pedestrian system.

Strategies

1. Incorporate typical street cross section guidelines in the City's public works design standards that address vehicular, bicycle, pedestrian, and transit needs.
2. Include a Road Modification Process in the Sherwood Development Code to provide a procedure for granting variances from street design standards for parking, pedestrian facilities, signals, and other roadway features.
3. Consider the Metro 2040 Plan Regional Street Design Elements when planning for improvements to City transportation facilities, including those built by ODOT or Tri Met.
4. Incorporate guidelines in the City's development code that establish when a local street refinement plan must be prepared and the process for preparing such a plan.
5. Amend the city development code as necessary to regulate vehicular access, spacing, circulation, and parking consistent with plan policies.

6. Amend the city development code as necessary to include specific guidelines for determining the proportional benefit contribution associated with requirements for street dedication and the construction of off-site transportation improvements.
7. Amend the development code to include standards and procedures for a transportation impact analysis (TIA). Refer to Appendix for example.
8. Develop a list to prioritize refinement plan needs, such as corridor plans and interchange area management plans.
9. Amend development code to include provisions for implementing traffic calming mechanisms.
10. Create a map that identifies locations targeted for on-street parking, such as in neighborhood commercial areas and the town center that support multi-modal options.
11. Regularly update the development code to ensure consistency with regional parking requirements.
12. Develop a "conceptual new streets plan" map for all contiguous areas of vacant and redevelopable parcels of 5 (five) or more acres planned or zoned for residential or mixed-use development, and adopt the map as part of the TSP.
13. Consider a "mixed-use" overlay zone in the development code that will apply to the Six Corners area. Include design standards that will encourage a vibrant, pedestrian friendly environment through the implementation of boulevards, medians, mixed-use development and site design.

Goal 4: Develop complementary infrastructure for bicycles and pedestrian facilities to provide a diverse range of transportation choices for city residents.

Policy 1 – The City of Sherwood shall provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes.
Policy 2 – Sidewalks and bikeways shall be provided on all arterial and collector streets for the safe and efficient movement of pedestrians and bicyclists between residential areas, schools, employment, commercial and recreational areas.
Policy 3 – The City of Sherwood will pursue development of local and regional pedestrian trail facilities, especially a trail system connection between the city and the Tualatin National Wildlife Refuge.
Policy 4—The City of Sherwood shall provide design standards for roadway traffic calming features such as traffic circles, curb extensions, bulb-outs, and speed humps.

Policy 5 – The City of Sherwood shall include requirements for the provision of bicycle parking on large commercial, industrial, and multi-family residential projects.
Policy 6 – The City of Sherwood will coordinate the bikeway system with adjacent jurisdictions, especially Tualatin, Wilsonville, Clackamas and Washington County.
Policy 7 – The City will work to eliminate architectural barriers from buildings and public improvements, which limit elderly and handicapped use of the transportation system.

Strategies

1. Include pedestrian and bike projects in the capital improvement plan to ensure investment in alternative modes;
2. Use intergovernmental agreements with Tualatin and Washington County for the coordination of urban services per ORS 196.065 to coordinate the bikeway system and trail system;
3. Include design standards for sidewalk and bikeway facilities in the city's roadway design guidelines;
4. Include provisions for planning the location of pedestrian and bike routes for connecting residential, school, commercial, employment and recreational areas in the development code guidelines for preparing local street refinement plans;
5. Include a system of bikeways along collector and arterial roadways as illustrated on the Transportation Plan Map;
6. Include requirements in the development code for private development to provide bike and pedestrian facilities as indicated on the Transportation Plan Map;
7. Include design standards for sidewalks and bicycle facilities in the city's roadway design guidelines;
8. Pursue traffic calming techniques for neighborhood and local streets so as to provide safe passage for pedestrians and bicyclists, and a more pleasant neighborhood environment for residents.
9. Construct and install infrastructure, including storm drain inlets, which are pedestrian and bicycle-friendly.

Goal 5: Provide reliable convenient transit service to Sherwood residents and businesses as well as special transit options for the city's elderly and disabled residents.

Policy 1 – Public transportation shall be provided as an alternative means of transportation in Sherwood.
Policy 2 – The City of Sherwood will work with Tri-Met to expand transit services to all parts of the City through additional routes, more frequent service, and transit oriented street improvements.
Policy 3 – Park-and-ride facilities should be located with convenient access to the arterial system to facilitate rider transfer to transit and car pools.
Policy 4 – Encourage the construction of bus shelters and park-n-ride lots in the vicinity of planned transit corridors.
Policy 5 – The City of Sherwood will support the establishment of a "feeder" transit route from downtown Sherwood to Tualatin employment centers.
Policy 6 – The City of Sherwood will support park and ride facilities that are sited for the maximum convenience of commuters and transit riders.
Policy 7—The City of Sherwood will support regional efforts for the preservation and development of appropriate rail rights-of-way for passenger rail service, in particular for serving local and regional commuter rail needs in Washington County, Clackamas County, and Yamhill County.
Policy 8 – The City of Sherwood will encourage the provision of special transportation services (i.e., van pools, or car pools, dial-a-ride, etc.) to transportation disadvantaged by Tri-Met and community-based service providers.
Policy 9 – Fully integrate the City into the regional transit system by expanding hours and destinations served by transit providers.
Policy 10 – The City will meet RTP goals of providing a safe and convenient pedestrian circulation system.

Strategies

1. Develop design standards to separate buses from the arterial roadway while transferring passengers. Establish a bus turnout design for stops on arterial streets.
2. Update development code to include design guidelines that require transit stops to be accessible to transit riders, especially the elderly and handicapped.
3. Amend development code to require development on sites at major transit stops (defined by the City of Sherwood) to do the following:
   - Locate within 20 feet of (or provide a pedestrian plaza) at the major transit stop;
   - Provide reasonably direct pedestrian connections between the transit stop and building entrances on the site;
   - Provide a transit service passenger landing pad accessible to disabled persons;
   - Provide an easement or right-of-way dedication for a passenger shelter and underground utility connection from the new

development to the transit amenity if requested by the public transit provider; and

- Improve public safety by providing lighting at transit stops.

4. Work with Tri-Met and Metro to extend transit options to Sherwood, which may include:
    - High capacity transit service along 99W terminating near Six Corners;
    - Potential extension of commuter rail line from Lake Oswego to Sherwood on the existing rail line with service to Newberg or McMinnville; and
    - Other regional transit service connections, such as frequent bus, interurban bus, as appropriate.

Goal 6: Provide a convenient and safe transportation network within and between the Sherwood Old Town (Town Center) and Six Corners area that enables mixed use development and provides multi-modal access to area businesses and residents.

Policy 1 – The City of Sherwood shall continue to refine and develop existing and new design guidelines and special standards for the Old Town and Six Corners areas to facilitate more pedestrian and transit friendly development.
Policy 2 – The City of Sherwood shall work to provide connectivity, via the off-street trail system and public right-of-way acquisitions and dedications, to better achieve street spacing and connectivity standards.

Strategies

1. Provide handicap ramps at all intersections with landings connected to sidewalk improvements, especially within Six Corners and Old Town areas.
2. Design transit stops in Six Corners and Old Town areas to meet ADA requirements for transit accessibility.
3. Adopt design and development guidelines for the Old Town areas that facilitate pedestrian use and a mix of commercial and residential development.
4. Adopt parking guidelines for the Old Town areas that are compatible with the parking guidelines established in Title 2 of the Metro Urban Growth Management Functional Plan.

Goal 7: Ensure that efficient and effective freight transportation infrastructure is developed and maintained to support local and regional economic expansion and diversification consistent with City economic plans and policies.

Policy 1 — The City of Sherwood will collaborate with federal, state and neighboring local governments and private business to ensure the investment in transportation infrastructure and services deemed necessary by the City to meet current and future demand for industrial and commercial freight movement.
Policy 2 — The City of Sherwood will adopt implementing regulations that provide for safe and convenient access to industrial and commercial areas for commercial vehicles, including freight loading and transfer facilities.
Policy 3 — The City of Sherwood will work cooperatively with local, regional and state agencies to protect the viability of truck and freight service routes within, through, and around the City of Sherwood, especially for Pacific Highway 99-W, the Tualatin-Sherwood Highway, and the planned I-5/Hwy 99-W Connector corridor.
Policy 4 — The City of Sherwood will work cooperatively with local, regional and state governments to ensure there is adequate air transportation infrastructure to serve local needs at regional airport facilities, including the Hillsboro Airport and Portland International airport.
Policy 5 — The City of Sherwood will strongly encourage the preservation of rail rights-of-way for future rail uses, and will work with appropriate agencies to ensure the availability of rail services to its industrial lands.
Policy 6 — The City of Sherwood will cooperate with local, regional and state governments to provide for regional marine freight infrastructure sufficient to serve local needs.
Policy 7 — The City of Sherwood will cooperate with the Portland Development Commission, Port of Portland, Washington County, and other economic development agencies to ensure the availability of inter-modal connectivity facilities deemed necessary to facilitate seamless freight transfer between all transport modes.

Strategies

1. Revise the Sherwood Development Code as necessary to include clear and objective standards for the provision of freight loading and handling facilities, such as restricted on-street parking, loading docks, truck access ways, and rail spurs, in all industrial and commercial development districts.
2. Participate in regional economic development planning efforts related to inter-modal transportation facilities.
3. Adopt appropriate standards to ensure the preservation of rail access corridors to Sherwood's industrial land base.

Goal 8: The Sherwood transportation network will be managed in a manner that ensures the plan is implemented in a timely fashion and is kept up to date with respect to local and regional priorities.

Policy 1 – The City of Sherwood shall develop a systematic approach to implementing the transportation network.
Policy 2 – The City of Sherwood shall pursue a diversified funding strategy to implement the transportation system plan including private, public and regional sources.
Policy 3 – The City of Sherwood shall use its adopted capital improvement plan to prioritize and schedule transportation projects based upon need as shown in the Transportation System Plan. Incorporate the transportation system priorities from the TSP into the city's capital improvement planning process.
Policy 4 – Project scheduling shall be performed in a systematic manner based on the priority rating process outlined in the Transportation System Plan and available financial resources.
Policy 5 – The Transportation System Plan shall be periodically updated, preferably on a five-year cycle, to assure consistency with changing ideas, philosophies, and related policies.

Strategies

1. Participate in MPAC, JPACT and other Metro advisory bodies to promote Sherwood transportation system improvements.
2. Local private financing resources will include right of way dedication and developer contributions to street improvements, and local improvement districts. Public resources will include local system development charges and bonding authority. Regional sources will include Washington County Traffic Impact Fees (TIF) and projects bonded through the County MSTIP program. Regional sources will also include Metro Transportation Improvement Plan (MTIP) resources and other state and federal grant assistance programs.
3. Adopt a comprehensive local system development charge (SDC) ordinance to either augment or replace CAP and collector street SDC.
4. Develop a method for scheduling improvement projects based on priority and funding sources.
5. Assign city staff and elected officials to participate in regional transportation planning processes.
6. Secure intergovernmental agreements between Sherwood and adjoining communities and regional service providers that outline cooperative measures for coordinating transportation investment and regulation per ORS 195.065.

C. THE TRANSPORTATION SYSTEM PLAN

The Transportation System Plan stresses the improvement of the existing system of transportation facilities before new facilities are built. Existing conditions have been analyzed in the Study Area (lands within UGB) and are contained in Chapter 3 of the TSP. Transportation analysis zones were created for each part of the city based on types of land use in the Comprehensive Plan Map. Future traffic volumes were projected based on expected build out of those zones. Future traffic volumes with trip origins or destinations in the Study Area were then calculated for selected subareas or zones in this case. Future locally generated traffic volumes were then distributed onto the street system based on assumption as to major directional movements. From this process future locally generated traffic volumes were calculated for major roads. Future traffic volumes within the Study Area represent only locally generated traffic. Reduction in traffic volumes over time on certain major streets assumes the progressive improvement of alternative major street routes, which have the effect of shifting traffic from existing to improved routes in satisfying major directional movements. To determine total volumes on major streets with significant through traffic (i.e. Highway 99W) locally generated volumes should be added to through traffic volumes determined by Washington County, Metro or ODOT.

The above analysis taken together with the application of the goals, objectives and policies described in Section B were used in the development of Transportation System Plan. A map for each existing and planned transportation system is included in the TSP. Each map, several street classifications, and the above policies were updated as well. The TSP (2005) is a technical reference to the Transportation element of the Comprehensive Plan.

The following information is included in the TSP and is included below for reference. **Table 1** is a list of functional classifications and definitions for each street followed by **Figure 1** Transportation Plan Map that illustrates the location and functional classification of each street. **Table 2** is a list of major transportation improvements planned for the next twenty years based on the transportation system analysis of expected traffic levels, a performance standard Level of Service "D", and projected costs. Generally, most of the improvements are upgrades and connections to existing streets while some improvements are proposed new streets.

Table 1. Functional Classification Definitions

Principal Arterials	Typically, freeways and state highways that are access controlled and provide the highest level of connectivity. These routes connect over the longest distance and are less frequent than other arterials or collectors. These highways generally span several jurisdictions and usually have statewide importance (as defined in the State Highway Classification System).[1] In Sherwood, OR 99W is the only route designated as a Statewide Highway.
Arterial Streets	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 for through traffic in lieu of a well placed arterial street. Access control is the key feature of an arterial route. Arterials are typically multiple miles in length. Many of these routes connect to cities surrounding Sherwood. Tualatin-Sherwood Road is a designated arterial street.
Collector Streets	Provide both access and circulation within and between residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function and do not require as extensive control of access (compared to arterials). Serve residential neighborhoods, distributing trips from the neighborhood and local street system. Collectors are typically greater than 0.5 to 1.0 miles in length.
Neighborhood Routes	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.
Local Streets	Sole function of providing access to immediate adjacent land. Service to "through traffic movement" on local streets is deliberately discouraged by design.

1 *1999 Oregon Highway Plan*, An Element of the Oregon Transportation Plan, Adopted by the Oregon Transportation Commission, March 18, 1999.

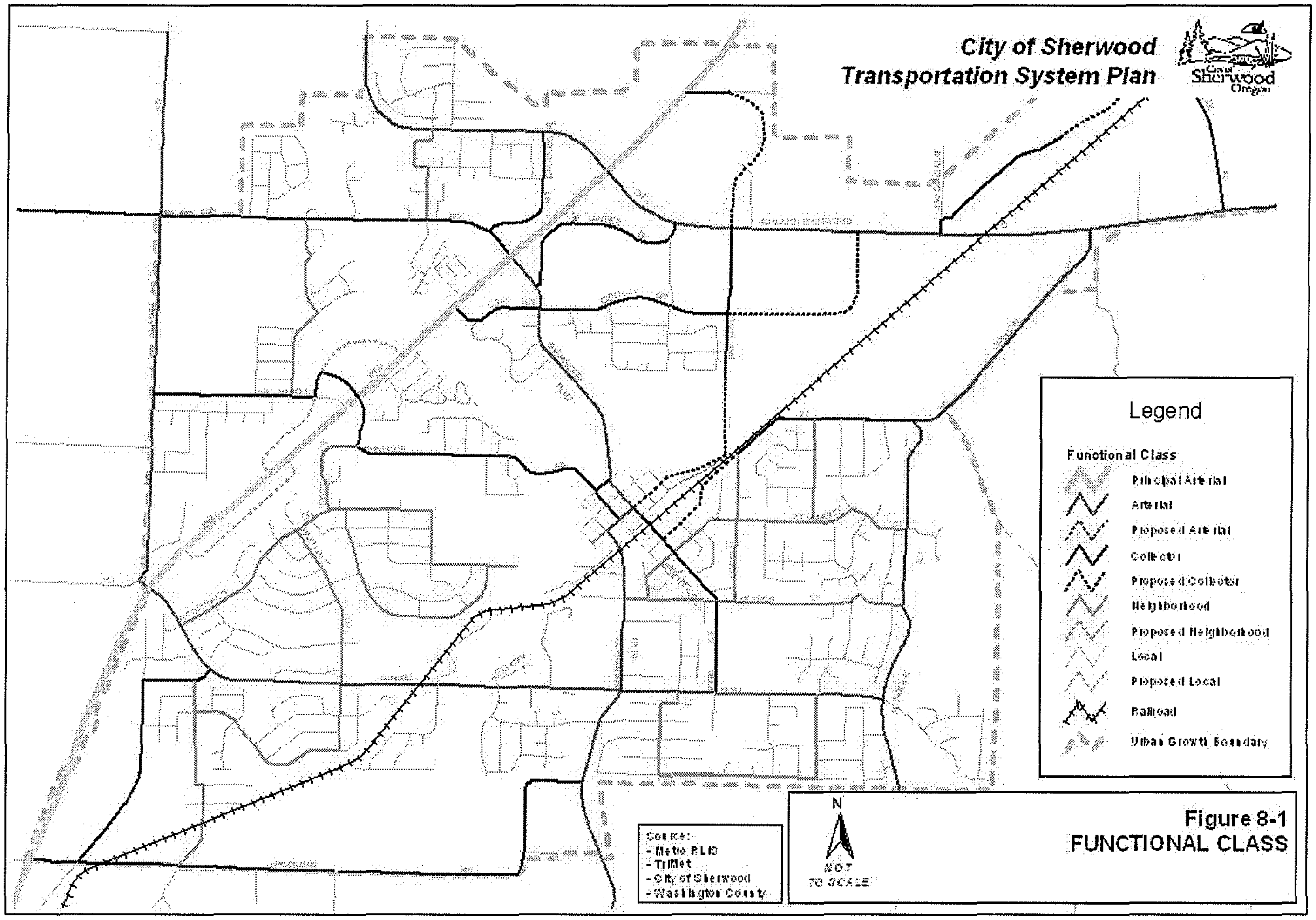


Figure 8-1
FUNCTIONAL CLASS

Table 2. Transportation Improvement Plan

ID	Location	From	To	Project	Source*	Cost ($1,000's)
			City Funded Motor Vehicle Projects			
1	Adams Avenue	Pine Street	Tualatin-Sherwood Road	Construction of 3 lane road	CIP/TSP	$5,900
2	Adams Avenue	Tualatin-Sherwood Road	Home Depot	Construction of 3 lane road	CIP/TSP	$2,100
3	Century Drive	Adams Avenue	Tualatin-Sherwood Road	Construction of 3 lane road	TSP	$2,700
4/5	Tualatin-Sherwood Road	Cipole Road	Borchers Drive	Signal timing/interconnect project	TSP	$50
6	Oregon Street	Lincoln Street	Pine Street	Extension/realignment (3 lanes)	CIP	$2,700
7	Pine Street	Willamette	Sunset	Extension across rail road tracks	CIP	$2,500
8	Old Town Streets			Phase 1 of the Downtown Sherwood Streetscape Master Plan	City	$10,400
9	Cannery Arterials*			Phase 2 of the Downtown Sherwood Streetscape Master Plan	City	$2,500
10	Future Phases*			Phase 3-6 of the Downtown Sherwood Streetscape Master Plan	City	$4,500
11	I-5/Hwy 99W Connector	Highway 99W	Interstate 5	Specific alignment to be determined	RTP	N/A
Subtotal (City)						*$33,350*
			County Funded Motor Vehicle Projects			
12	Tualatin-Sherwood Road	Hwy 99W	Cipole Road	Widen existing road to 5 lanes	RTP/Washington County TSP	$15,300
13	Roy Rodgers Road	Borchers Drive	Hwy 99W	Widen existing road to 5 lanes	RTP/Washington County TSP	$1,400
14	Elwert Road	ORE 99W	Kruger	Intersection safety improvement	TSP	$1,500
15	Brookman Road	ORE 99W	Ladd Hill Road	Improve to collector standards	TSP	$8,700
Subtotal (County)						*$26,900*

			Development Related Projects			
ID	**Location**	**From**	**To**	**Project Description**	**Source***	**Cost ($1,000's)**
23	Galbrieth Drive	Gerda Lane	Cipole Road	Construction of 2 lane road	TSP	$1,500
24	Cedar Brook Way	ORE 99W	ORE 99W	Construction of 2 lane road	TSP	$3,600
25	Connection	Meinecke Road	Woodhaven Drive	Construction of 2 lane road	TSP	$550
26	South Loop Road	ORE 99W	ORE 99W	Construction of 2 lane road	TSP	$1,800
27	Baler Way	Century Drive	Langer Drive	Construction of 2 lane road	TSP	$1,000
28	Handley Street	Aldridge Terrace	Elwert Road	Construction of 2 lane road	TSP	$1,200
9	Cannery Arterials**			Phase 2 of the downtown Sherwood Streetscape Master Plan	City	$1,100
10	Future Phases**			Phase 3-6 of the Downtown Sherwood Streetscape Master Plan	City	$1,000
Subtotal (Development Related Projects)						*$11,750*

		Traffic Control Enhancements (City Funded)		
ID	**Location**	**Project Description**	**Source***	**Cost ($1,000's)**
16	Edy Road/Borchers Drive	Additional traffic control measure	TSP, CIP	$300
17	Langer Drive/Tualatin-Sherwood Road	Remove Traffic Signal. Install raised median	TSP	$100
18	Sherwood Boulevard/Langer Drive	Remove Traffic Signal. Allow lefts in only (no lefts from Langer to Sherwood)	TSP	$150
19	Sherwood Boulevard/Century Drive	Install Traffic Signal or Roundabout	TSP	$275
20	Oregon Street/Tonquin Road	Traffic Control Enhancement (consider roundabout)	TSP	$1,000
21	Adams Street/Tualatin-Sherwood Road	Install Traffic Signal	TSP	$250
22	Sherwood Blvd/Sunset Blvd	Traffic Control Enhancement	TSP	$250
Subtotal (Traffic Control Enhancements)				$2,325
Total (City Funded)				***$29,225***
Total (Other Funding: State, Region, Development)				*$26,900*

* Source: RTP=Metro's Regional Transportation System Plan, TSP=Mitigation Required Based on Sherwood TSP Analysis, CIP=Capital Improvement Plan.
** Project costs paid through public/private partnership.

City of Sherwood Oregon

Home of the Tualatin River National Wildlife Refuge

DATE: March 4, 2005

TO: Ross Schultz, City Manager

SUBJ: Response Times

It was requested by the City Council to determine emergency response times from Old Town Sherwood to Villa Street in the Woodhaven Subdivision.

Three routes were driven by a Sergeant Mark Gaither on a police equipped BMW motorcycle.

The first route driven was from the TVF&R station down Oregon to Railroad and down Villa through the park via the pedestrian bridge to the stadium behind the High School. The time to drive this route was 1minute 50 seconds.

The second route driven was from the TVF&R station down Oregon to Railroad up Sherwood Boulevard to Sunset down Pinehurst down Stellar to Cobblestone to Villa (stadium). The time for this route 5 minutes.

The third route driven was from the TVF&R station down Oregon to Pine to 1st down Washington/Meinecke to Dewey to Woodhaven down Saunders to Villa (stadium). The time for this route 4 minutes 30 seconds.

The Police Department has primary responsibility for public safety, traffic enforcement and emergency response to our community's safety needs now and in the future. The success of our enforcement and emergency response remains dependant upon a viable Transportation System Plan (TSP) that meets the needs of all residents. As shown in this report it takes an extended period of time to currently respond to this location. Our officers need to have the shortest route possible to decrease response times. The additional access will make it possible to meet the Departments needs, providing greater security for the entire community.

City of Sherwood
Transportation System Plan

Prepared for

City of Sherwood Oregon

Home of the Tualatin River National Wildlife Refuge

TECHNICAL APPENDIX

Submitted by

DKS *Associates*

TRANSPORTATION SOLUTIONS

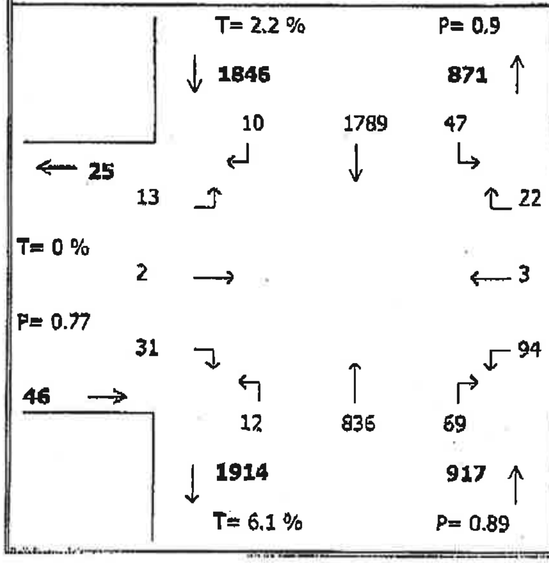
March 2005

APPENDIX

Traffic Counts

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: Dgwylm



Peak Hour
16:30-17:30

Total Entry Volume
2928

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

ORE 99W AT SIGNALIZED HOME DEPOT ENTRANCE
SHERWOOD, OR

Date: **05/06/03** Day: **TUE**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY,INC
1225 NW Murray Blvd, Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

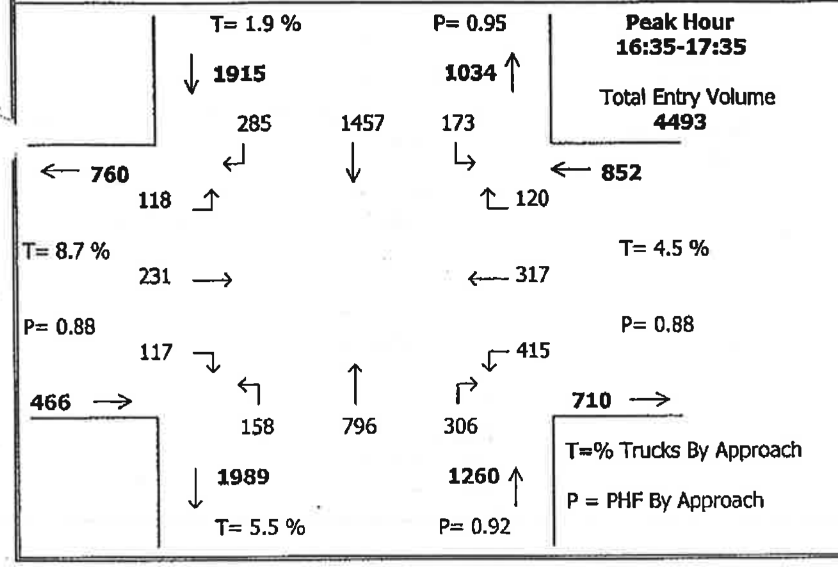
Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND				
TIME PERIOD	↴	⟶	⤴	↵	↓	↳	↰	↑	↱	↲	⟵	↰	ALL	
16:00-16:05	0	0	0	2	112	2	0	57	5	7	0	1	186	
16:05-16:10	0	1	0	2	150	2	1	78	3	3	0	2	242	
16:10-16:15	1	0	1	0	125	4	2	67	6	11	0	3	220	
16:15-16:20	1	0	2	2	145	1	2	98	9	7	0	2	269	
16:20-16:25	0	0	2	2	96	6	1	50	5	8	0	4	174	
16:25-16:30	3	0	0	1	116	0	2	79	7	8	0	0	216	
16:30-16:35	0	0	3	1	135	6	0	72	6	7	0	1	231	
16:35-16:40	2	0	0	0	151	7	6	81	6	11	0	2	266	
16:40-16:45	4	0	1	0	160	1	3	63	5	10	0	4	251	
16:45-16:50	2	1	1	1	144	3	0	85	9	8	1	2	257	
16:50-16:55	2	0	0	0	131	4	1	45	3	5	1	2	194	
16:55-17:00	3	0	1	1	143	1	0	66	6	4	0	0	225	
17:00-17:05	4	0	4	2	130	5	1	74	7	7	1	3	238	
17:05-17:10	2	0	0	1	149	0	0	85	7	8	0	1	253	
17:10-17:15	4	0	1	0	156	6	0	51	10	12	0	1	241	
17:15-17:20	1	0	1	1	168	5	1	78	5	5	0	1	266	
17:20-17:25	2	1	0	2	173	4	0	65	4	10	0	3	264	15
17:25-17:30	5	0	1	1	149	5	0	71	1	7	0	2	242	
17:30-17:35	0	0	1	1	127	1	3	66	1	14	0	2	216	
17:35-17:40	4	0	0	0	141	3	1	89	7	4	0	5	254	
17:40-17:45	0	0	1	0	102	2	0	73	13	6	0	3	200	
17:45-17:50	2	0	1	1	130	0	0	81	8	10	0	3	236	
17:50-17:55	1	0	1	2	126	1	3	80	6	12	0	1	233	
17:55-18:00	2	0	2	1	131	0	1	82	13	7	0	1	240	

TOTALS	45	3	24	24	3290	69	28	1736	152	191	3	49	5814
PHF	0.77	0.5	0.65	0.63	0.9	0.78	0.33	0.91	0.72	0.81	0.38	0.69	0.95
% Trucks	0	0	0	0	2.2	1.4	0	6.5	2	1.6	0	4.1	3.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: Dlmg.mod



Peak Hour
16:35-17:35

Total Entry Volume
4493

LOCATION:

ORE 99W AT TUALATIN-SHERWOOD ROAD
SHERWOOD, OR

Date: **04/09/03** Day: **Wed**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

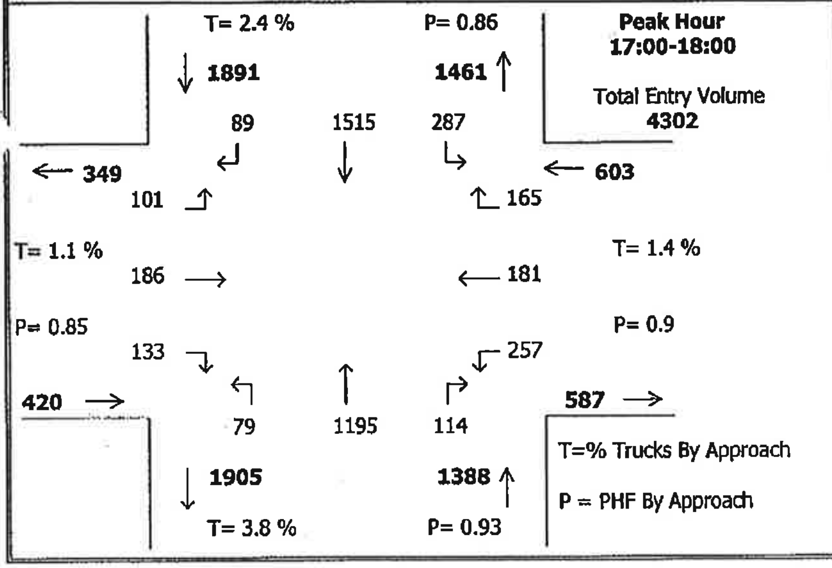
Report Reviewed by: JG

TIME PERIOD	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			ALL
	⤵	→	⤴	↲	↓	↳	↰	↑	↱	↙	←	↖	
16:00-16:05	4	15	5	15	99	13	12	54	21	17	20	11	286
16:05-16:10	6	21	6	16	112	8	10	50	26	45	34	12	346
16:10-16:15	10	23	9	26	118	10	20	67	42	30	22	11	388
16:15-16:20	11	18	12	11	118	7	11	50	29	45	38	5	355
16:20-16:25	7	27	10	16	108	16	16	92	35	30	13	10	380
16:25-16:30	4	13	5	23	130	11	12	42	26	56	32	14	368
16:30-16:35	16	24	3	16	122	18	14	58	33	29	16	8	357
16:35-16:40	11	13	8	22	126	8	9	49	24	40	33	9	352
16:40-16:45	15	25	10	19	103	18	19	69	32	28	24	9	371
16:45-16:50	8	12	12	33	139	19	10	57	27	42	29	6	394
16:50-16:55	8	14	10	17	120	18	18	87	24	31	17	11	375
16:55-17:00	5	16	7	23	124	12	14	60	29	41	30	12	373
17:00-17:05	12	22	10	37	111	16	16	51	27	18	20	11	351
17:05-17:10	11	17	9	22	132	7	15	63	26	52	32	12	398
17:10-17:15	6	26	11	23	117	21	9	71	20	32	26	17	379
17:15-17:20	7	19	10	26	121	10	15	53	31	32	33	7	364
17:20-17:25	9	23	9	21	127	17	10	68	15	16	21	7	343
17:25-17:30	18	19	9	23	111	12	9	67	22	43	31	8	372
17:30-17:35	7	25	13	19	126	15	14	101	29	40	21	11	421
17:35-17:40	14	14	2	17	112	14	10	57	17	51	33	9	350
17:40-17:45	8	23	4	53	107	16	16	60	28	20	18	11	364
17:45-17:50	18	18	4	17	113	11	9	70	24	42	34	8	368
17:50-17:55	13	21	10	17	104	14	12	81	34	29	25	7	367
17:55-18:00	21	24	8	19	109	6	7	42	20	46	37	10	349

TOTALS	249	472	196	531	2809	317	307	1519	641	855	639	236	8771
PHF	0.86	0.85	0.92	0.87	0.95	0.79	0.82	0.84	0.92	0.89	0.87	0.75	0.98
% Trucks	1.2	10.2	14.8	1.7	1.4	7.6	3.9	4.7	8.1	4.6	4.1	5.1	4.2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			4			2			9		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: djzg.mod



Peak Hour
17:00-18:00

Total Entry Volume
4302

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

HIGHWAY 99W AT SHERWOOD BLVD/EDY RD
SHERWOOD, OR

Date: **04/15/03** Day: **TUE**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

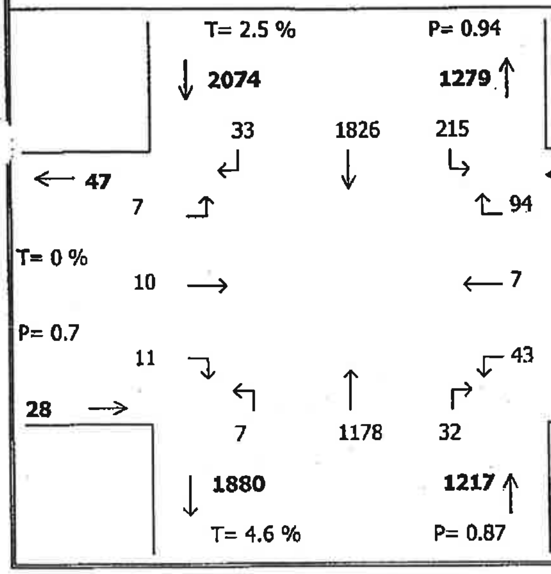
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	→	↗	SOUTHBOUND ↲	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ↙	←	↖	ALL
16:00-16:05	5	10	11	13	104	23	4	98	5	13	12	22	320
16:05-16:10	4	19	10	4	90	14	0	76	7	13	12	11	260
16:10-16:15	7	8	7	5	140	27	1	93	7	18	14	9	336
16:15-16:20	16	12	8	8	90	8	6	92	8	26	15	17	306
16:20-16:25	9	10	5	10	175	27	3	93	9	13	12	10	376
16:25-16:30	11	21	13	9	100	23	6	77	10	21	21	14	326
16:30-16:35	7	5	7	4	146	24	5	117	11	18	11	15	370
16:35-16:40	11	20	10	10	103	14	7	90	3	29	14	12	323
16:40-16:45	7	12	5	3	170	29	5	113	4	20	14	11	393
16:45-16:50	5	17	16	6	100	20	5	71	10	30	14	18	312
16:50-16:55	9	14	6	5	143	32	5	102	13	21	16	10	376
16:55-17:00	8	21	10	7	81	19	10	61	10	32	14	7	280
17:00-17:05	7	13	6	1	142	29	6	89	9	23	7	16	348
17:05-17:10	5	19	5	5	95	24	3	110	7	25	24	20	342
17:10-17:15	8	14	8	11	148	34	12	110	10	17	11	17	400
17:15-17:20	7	12	7	4	115	18	7	83	5	22	18	11	309
17:20-17:25	15	12	7	10	161	19	4	129	10	13	13	7	400
17:25-17:30	14	17	13	5	114	20	7	95	7	22	19	13	346
17:30-17:35	12	12	9	12	175	31	8	93	16	17	13	16	414
17:35-17:40	14	20	11	1	98	18	4	97	8	31	21	14	337
17:40-17:45	8	12	10	13	132	36	9	115	12	14	13	16	390
17:45-17:50	15	19	12	7	93	19	8	92	13	31	10	17	336
17:50-17:55	14	15	7	11	140	23	4	108	11	14	10	12	369
17:55-18:00	14	21	6	9	102	16	7	74	6	28	22	6	311

TOTALS	232	355	209	173	2957	547	136	2278	211	511	350	321	8280
PHF	0.77	0.85	0.77	0.72	0.84	0.82	0.86	0.93	0.79	0.85	0.85	0.78	0.93
% Trucks	1.3	0.8	1.4	1.7	2.8	0.7	1.5	4	2.4	0.4	0.9	3.7	2.6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			3			6		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: DJZKLM.mod



Peak Hour
16:40-17:40

Total Entry Volume
3463

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

HWY 99W AT MEINECKE PARKWAY
SHERWOOD, OR

Date: **04/22/03** Day: **TUE**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

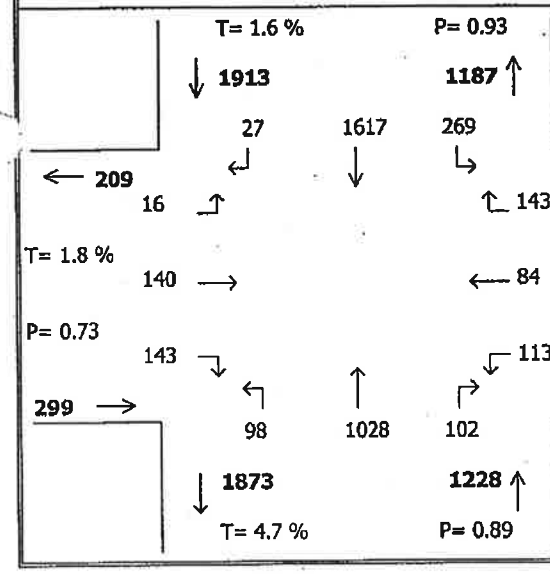
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	EASTBOUND →	EASTBOUND ⮥	SOUTHBOUND ↲	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↙	WESTBOUND ←	WESTBOUND ⮤	ALL
16:00-16:05	1	0	1	2	129	9	0	94	5	3	1	3	248
16:05-16:10	0	1	0	1	140	15	0	94	1	0	0	6	258
16:10-16:15	0	1	1	1	135	21	1	98	1	1	1	10	271
16:15-16:20	0	0	2	3	144	11	0	100	3	4	1	7	275
16:20-16:25	0	0	0	5	147	15	0	74	0	3	0	7	251
16:25-16:30	0	0	0	4	185	14	0	84	2	3	1	3	296
16:30-16:35	0	1	0	3	164	12	2	89	0	2	0	9	282
16:35-16:40	0	1	0	2	141	7	0	82	3	3	0	4	243
16:40-16:45	2	1	1	3	169	18	2	101	1	4	3	11	316
16:45-16:50	2	2	0	2	150	24	1	91	0	2	1	5	280
16:50-16:55	0	1	1	4	157	21	0	91	6	4	0	0	285
16:55-17:00	1	1	1	1	133	14	1	92	5	2	0	3	254
17:00-17:05	0	0	0	4	139	20	1	96	3	2	0	8	273
17:05-17:10	0	2	0	1	170	21	1	76	2	10	1	12	296
17:10-17:15	1	0	0	3	163	9	0	87	0	4	0	9	276
17:15-17:20	1	0	0	1	167	19	1	130	1	4	1	12	337
17:20-17:25	3	1	0	0	135	19	0	111	2	2	0	5	278
17:25-17:30	0	1	0	2	173	19	0	96	8	3	0	10	312
17:30-17:35	1	0	2	5	140	13	0	117	3	3	1	9	294
17:35-17:40	0	1	2	7	130	18	0	90	1	3	0	10	262
17:40-17:45	1	0	1	3	150	18	0	94	1	0	1	8	277
17:45-17:50	0	1	1	6	125	23	1	84	3	2	2	13	261
17:50-17:55	1	2	0	3	135	10	2	116	1	2	0	5	277
17:55-18:00	1	1	2	3	153	28	0	71	4	6	0	15	284

TOTALS	15	18	15	69	3574	398	13	2258	56	72	14	184	6686
PHF	0.55	0.63	0.44	0.59	0.91	0.85	0.58	0.87	0.57	0.6	0.44	0.71	0.93
% Trucks	0	0	0	1.4	2.7	0.8	0	4.8	0	2.8	7.1	2.2	3.2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		4			0			2			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: EROBLM



Peak Hour
17:00-18:00

Total Entry Volume
3780

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

ORE 99W AT SUNSET BOULEVARD
SHERWOOD, OR

Date: **04/10/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			
TIME PERIOD	⤵	→	⤴	↲	↓	↳	↰	↑	↱	↙	←	↖	ALL
16:00-16:05	11	9	1	2	152	18	3	52	10	10	4	6	278
16:05-16:10	7	3	6	2	119	10	7	86	5	12	6	16	279
16:10-16:15	7	6	1	0	127	13	4	79	8	9	7	5	266
16:15-16:20	8	8	3	1	116	16	0	66	4	12	3	3	240
16:20-16:25	14	8	1	2	148	16	8	88	7	10	3	14	319
16:25-16:30	10	9	1	0	156	13	6	89	8	4	1	14	311
16:30-16:35	12	5	1	3	118	11	6	81	8	7	2	5	259
16:35-16:40	12	4	1	2	113	22	4	81	5	7	2	12	265
16:40-16:45	16	14	1	2	104	15	9	70	8	10	4	9	262
16:45-16:50	14	4	1	1	155	11	5	82	9	15	5	11	313
16:50-16:55	6	12	2	1	157	21	8	86	6	6	4	13	322
16:55-17:00	9	15	1	2	128	24	6	83	10	6	2	10	296
17:00-17:05	6	16	3	1	135	14	8	78	8	6	7	16	298
17:05-17:10	16	5	0	2	121	16	10	69	7	8	8	9	271
17:10-17:15	9	9	5	5	130	23	4	92	7	9	13	13	319
17:15-17:20	8	20	1	1	132	23	11	89	5	10	3	12	315
17:20-17:25	7	12	0	2	158	24	6	89	7	15	9	9	338
17:25-17:30	14	10	3	1	127	31	7	64	7	11	1	9	285
17:30-17:35	9	6	0	2	148	23	8	104	13	10	7	11	341
17:35-17:40	22	9	0	3	136	28	10	88	9	9	7	17	338
17:40-17:45	19	17	2	6	113	24	7	68	9	8	7	15	295
17:45-17:50	16	17	1	3	126	19	5	111	8	8	5	5	324
17:50-17:55	11	9	1	1	155	26	15	95	10	9	8	15	355
17:55-18:00	6	10	0	0	136	18	7	81	12	10	9	12	301

TOTALS	269	237	36	45	3210	459	164	1971	190	221	127	261	7190
PHF	0.63	0.81	0.5	0.56	0.93	0.82	0.91	0.9	0.82	0.78	0.75	0.83	0.96
% Trucks	1.1	1.7	8.3	2.2	1.7	0.7	1.2	5.3	1.1	2.3	1.6	4.6	2.8
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT | File: Maxslm

T= 2 % P= 0.92
1769 1184
28 1714 27
45 35
26 3
T= 2 % T= 4.5 %
0 5
P= 0.56 P= 0.63
1 27
27 37
12 1155 10
1742 1177
T= 3.8 % P= 0.89

Peak Hour
16:40-17:40

Total Entry Volume
3008

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

ORE 99W AT BROOKMAN ROAD
SHERWOOD, OR

Date: **04/10/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

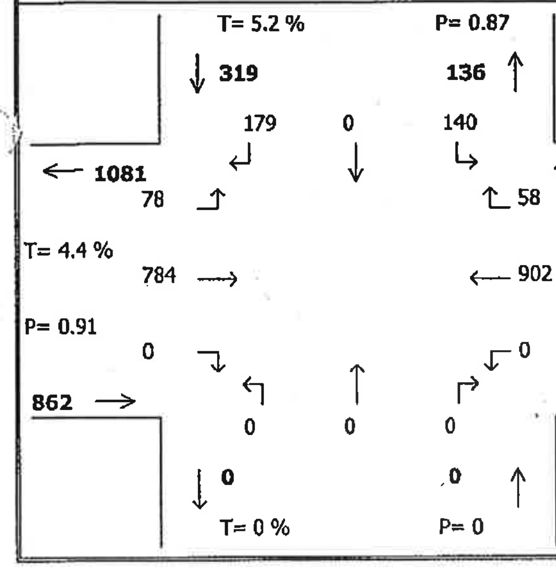
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	EASTBOUND →	EASTBOUND ↱	SOUTHBOUND ↲	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↲	WESTBOUND ←	WESTBOUND ↰	ALL
16:00-16:05	0	0	1	1	114	3	1	80	2	3	0	0	205
16:05-16:10	0	0	0	3	110	0	0	102	0	5	0	0	220
16:10-16:15	0	0	1	2	133	2	0	78	1	3	1	0	221
16:15-16:20	0	0	1	4	162	1	0	97	1	0	1	1	268
16:20-16:25	0	0	1	6	151	0	0	79	4	1	1	1	244
16:25-16:30	0	1	1	3	134	1	0	96	1	0	0	0	237
16:30-16:35	1	0	1	2	116	2	1	78	1	0	0	0	202
16:35-16:40	0	0	1	1	111	1	0	124	2	0	0	2	242
16:40-16:45	0	0	0	2	182	0	1	82	1	5	1	1	275
16:45-16:50	0	0	1	3	154	1	0	83	1	3	0	0	246
16:50-16:55	0	0	2	1	113	0	0	108	0	2	1	1	228
16:55-17:00	0	0	6	2	156	1	1	70	0	2	0	1	239
17:00-17:05	0	0	1	1	118	2	1	108	1	5	0	0	237
17:05-17:10	1	0	4	2	119	4	0	106	0	3	1	0	240
17:10-17:15	0	0	0	5	157	6	1	93	1	2	0	0	265
17:15-17:20	0	0	5	1	170	4	0	90	0	2	0	0	272
17:20-17:25	0	0	0	2	135	3	2	93	4	1	0	0	240
17:25-17:30	0	0	1	4	110	2	2	129	1	1	1	0	251
17:30-17:35	0	0	3	1	163	0	0	100	1	0	0	0	268
17:35-17:40	0	0	3	4	137	4	4	93	0	1	1	0	247
17:40-17:45	0	1	4	1	120	6	1	93	1	2	0	2	231
17:45-17:50	0	0	4	4	126	4	2	111	0	2	0	0	253
17:50-17:55	0	1	1	3	141	2	1	71	2	2	0	1	225
17:55-18:00	1	1	0	2	120	1	0	66	1	3	0	1	196

TOTALS	3	4	42	60	3252	50	18	2230	26	48	8	11	5752
PHF	0.25	0	0.59	0.78	0.93	0.48	0.5	0.9	0.42	0.68	0.63	0.38	0.97
% Trucks	33.3	0	0	3.3	1.9	2	0	3.9	0	4.2	0	9.1	2.7
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: LTIW



Peak Hour
16:25-17:25

Total Entry Volume
2141

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

TUALATIN-SHERWOOD ROAD AT CIPOLE ROAD
SHERWOOD, OR

Date: **04/15/03** Day: **TUE**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

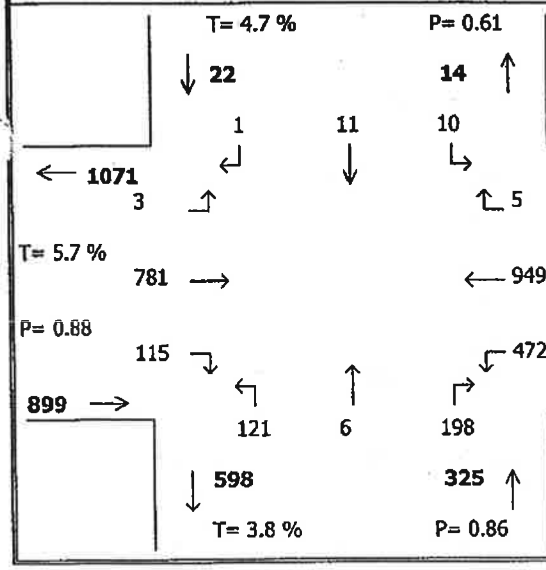
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	→	↗	SOUTHBOUND ↲	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ↙	←	↖	ALL
16:00-16:05	0	56	5	17	0	20	0	0	0	0	58	10	166
16:05-16:10	0	70	13	17	0	30	0	0	0	0	60	6	196
16:10-16:15	0	55	8	27	0	16	0	0	0	0	55	3	164
16:15-16:20	0	70	2	12	0	10	0	0	0	0	73	1	168
16:20-16:25	0	60	3	10	0	9	0	0	0	0	41	3	126
16:25-16:30	0	57	4	13	0	7	0	0	0	0	88	9	178
16:30-16:35	0	56	6	18	0	13	0	0	0	0	59	4	156
16:35-16:40	0	75	5	18	0	18	0	0	0	0	67	7	190
16:40-16:45	0	72	4	9	0	13	0	0	0	0	90	1	189
16:45-16:50	0	72	8	15	0	11	0	0	0	0	56	3	165
16:50-16:55	0	67	8	20	0	3	0	0	0	0	53	6	157
16:55-17:00	0	61	6	9	0	5	0	0	0	0	92	7	180
17:00-17:05	0	72	5	15	0	15	0	0	0	0	57	3	167
17:05-17:10	0	54	7	13	0	17	0	0	0	0	81	2	174
17:10-17:15	0	64	14	20	0	12	0	0	0	0	68	7	185
17:15-17:20	0	76	6	14	0	12	0	0	0	0	90	3	201
17:20-17:25	0	58	5	15	0	14	0	0	0	0	101	6	199
17:25-17:30	0	60	4	12	0	10	0	0	0	0	75	3	164
17:30-17:35	0	59	13	13	0	4	0	0	0	0	5	19	113
17:35-17:40	0	34	19	17	0	4	0	0	0	0	3	22	99
17:40-17:45	0	32	24	18	0	3	0	0	0	0	9	26	112
17:45-17:50	0	25	36	25	0	5	0	0	0	0	24	11	126
17:50-17:55	0	65	20	23	0	6	0	0	0	0	64	5	183
17:55-18:00	0	89	6	24	0	6	0	0	0	0	83	3	211

TOTALS	0	1459	231	394	0	263	0	0	0	0	1452	170	3969
PHF	0	0.89	0.72	0.91	0	0.8	0	0	0	0	0.87	0.73	0.91
% Trucks	0	4	6.9	4.6	0	6.1	0	0	0	0	3.8	11.8	4.6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			1		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: MAXV



Peak Hour
17:00-18:00

Total Entry Volume
2672

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

TUALATIN-SHERWOOD ROAD AT OREGON STREET
SHERWOOD, OR

Date: **04/16/03** Day: **WED**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

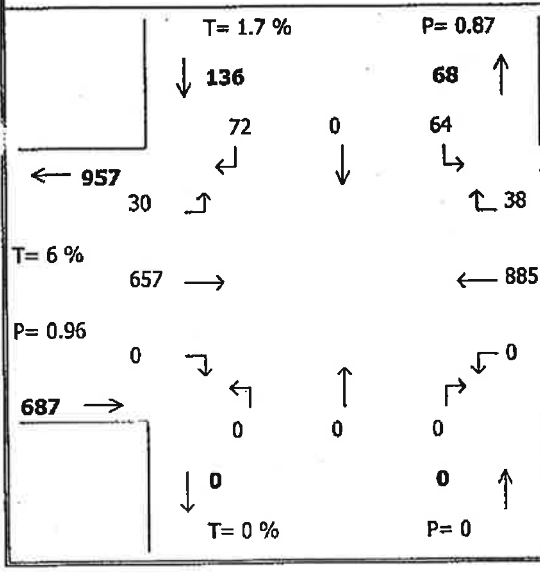
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	→	⤴	SOUTHBOUND ↲	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ↲	←	↰	ALL
16:00-16:05	3	68	0	0	3	4	9	0	12	26	58	0	183
16:05-16:10	12	73	0	0	0	1	4	0	14	32	71	1	208
16:10-16:15	8	52	0	1	0	3	7	1	15	37	76	0	200
16:15-16:20	7	58	1	1	0	1	6	0	26	20	86	0	206
16:20-16:25	6	75	0	0	0	1	7	0	13	32	59	1	194
16:25-16:30	10	53	0	0	0	2	9	0	7	49	54	0	184
16:30-16:35	10	44	0	1	0	1	13	0	11	33	72	0	185
16:35-16:40	6	60	0	0	1	0	15	0	19	32	110	2	245
16:40-16:45	17	37	0	0	0	0	15	1	10	27	91	0	198
16:45-16:50	7	64	0	0	0	0	4	0	9	43	72	0	199
16:50-16:55	11	49	0	0	0	0	9	1	11	45	82	0	208
16:55-17:00	11	33	1	0	0	1	13	0	18	21	89	2	189
17:00-17:05	12	97	1	0	6	1	15	3	16	51	39	1	242
17:05-17:10	10	57	0	0	2	0	10	0	15	43	85	1	223
17:10-17:15	9	70	0	0	0	0	17	3	13	35	82	0	229
17:15-17:20	5	64	0	0	0	1	8	0	21	45	109	1	254
17:20-17:25	5	63	0	0	0	0	16	0	16	44	91	0	235
17:25-17:30	8	71	0	0	0	0	12	0	15	45	91	0	242
17:30-17:35	11	46	0	0	0	0	8	0	28	27	80	0	200
17:35-17:40	11	73	0	0	0	3	8	0	8	17	70	1	191
17:40-17:45	8	58	0	0	0	1	12	0	13	45	71	0	208
17:45-17:50	7	69	0	1	2	2	4	0	17	23	67	1	193
17:50-17:55	11	47	1	0	0	1	4	0	15	50	73	0	202
17:55-18:00	18	66	1	0	1	1	7	0	21	47	91	0	253

TOTALS	223	1447	5	4	15	24	232	9	363	869	1869	11	5071
PHF	0.8	0.87	0.38	0.25	0.34	0.42	0.72	0.25	0.84	0.88	0.82	0.63	0.91
% Trucks	9	5.2	0	0	0	8.3	5.2	11.1	2.8	1.3	2.8	27.3	3.7
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			1			0			1		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: ErohLM



Peak Hour
16:10-17:10

Total Entry Volume
1746

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

TUALATIN-SHERWOOD ROAD AT GERDA LANE
SHERWOOD, OR

Date: **04/17/03** Day: **THU**
From: **16:00-18:00**

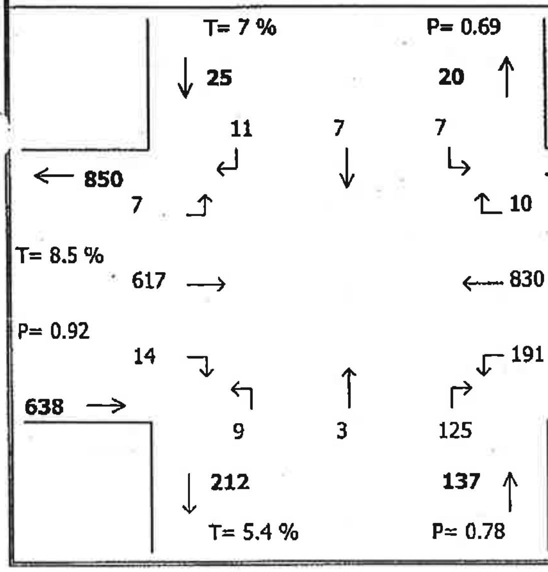
Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	→	⬏	SOUTHBOUND ↵	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ⬐	←	⬑	ALL
16:00-16:05	0	60	5	2	0	8	0	0	0	0	72	4	151
16:05-16:10	0	50	3	11	0	2	0	0	0	0	55	2	123
16:10-16:15	0	58	5	10	0	6	0	0	0	0	94	6	179
16:15-16:20	0	57	1	8	0	2	0	0	0	0	66	5	139
16:20-16:25	0	56	0	6	0	7	0	0	0	0	86	2	157
16:25-16:30	0	61	4	1	0	8	0	0	0	0	62	0	136
16:30-16:35	0	50	5	5	0	5	0	0	0	0	58	3	126
16:35-16:40	0	49	5	8	0	8	0	0	0	0	70	3	143
16:40-16:45	0	57	1	5	0	5	0	0	0	0	81	4	153
16:45-16:50	0	49	3	3	0	2	0	0	0	0	73	4	134
16:50-16:55	0	52	4	6	0	4	0	0	0	0	76	3	145
16:55-17:00	0	63	1	8	0	5	0	0	0	0	74	4	155
17:00-17:05	0	50	1	4	0	4	0	0	0	0	77	0	136
17:05-17:10	0	55	0	8	0	8	0	0	0	0	68	4	143
17:10-17:15	0	48	1	5	0	11	0	0	0	0	83	3	151
17:15-17:20	0	59	2	5	0	2	0	0	0	0	75	2	145
17:20-17:25	0	62	1	2	0	3	0	0	0	0	75	2	145
17:25-17:30	0	62	0	5	0	4	0	0	0	0	70	3	144
17:30-17:35	0	55	0	5	0	6	0	0	0	0	66	2	134
17:35-17:40	0	63	2	1	0	3	0	0	0	0	74	2	145
17:40-17:45	0	61	0	3	0	4	0	0	0	0	73	1	142
17:45-17:50	0	58	1	3	0	5	0	0	0	0	65	4	136
17:50-17:55	0	72	1	3	0	3	0	0	0	0	79	2	160
17:55-18:00	0	52	1	4	0	2	0	0	0	0	83	1	143
TOTALS	0	1359	47	121	0	117	0	0	0	0	1755	66	3465
PHF	0	0.94	0.54	0.75	0	0.76	0	0	0	0	0.9	0.73	0.92
% Trucks	0	5.8	10.6	0.8	0	2.6	0	0	0	0	3.9	16.7	4.8
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT	File: Djzelm



Peak Hour
16:35-17:35

Total Entry Volume
1831

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

TUALATIN-SHERWOOD ROAD AT LANGER DRIVE
SHERWOOD, OR

Date: **04/10/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

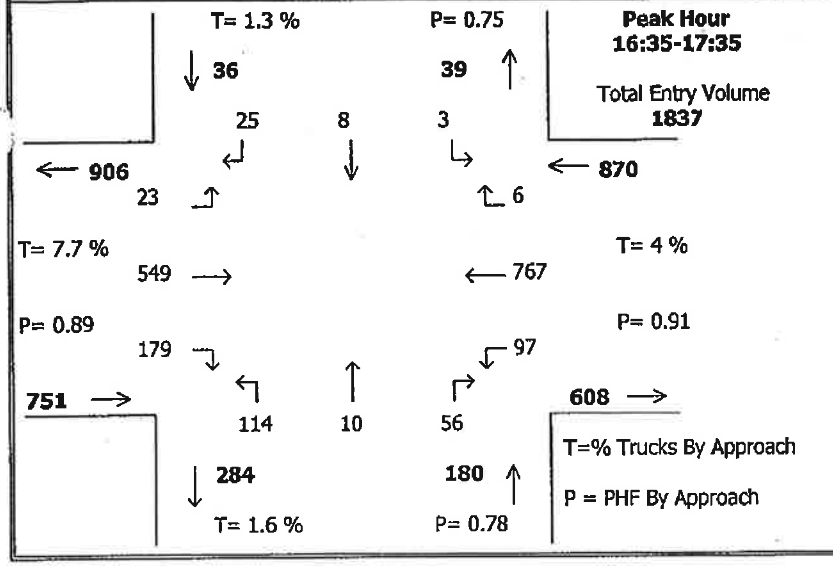
Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	→	⬏	SOUTHBOUND ↲	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ⬐	←	⬑	ALL
16:00-16:05	1	39	0	1	0	0	2	1	5	18	58	1	126
16:05-16:10	1	49	1	0	2	0	0	1	14	18	45	0	131
16:10-16:15	1	56	2	1	1	0	0	1	4	23	42	1	132
16:15-16:20	3	35	0	0	0	0	0	0	14	22	68	0	142
16:20-16:25	0	51	0	1	0	1	0	0	10	19	75	0	157
16:25-16:30	1	49	1	2	0	1	2	0	6	18	62	2	144
16:30-16:35	2	42	1	0	0	1	0	0	7	24	68	1	146
16:35-16:40	1	45	1	0	2	0	0	1	5	17	66	3	141
16:40-16:45	0	49	0	4	0	0	0	0	5	23	73	0	154
16:45-16:50	1	62	1	2	1	0	0	1	18	18	49	0	153
16:50-16:55	3	48	1	1	0	0	0	0	10	22	68	2	155
16:55-17:00	1	50	0	0	2	0	0	0	9	20	79	1	162
17:00-17:05	0	59	3	0	1	1	1	1	8	12	76	0	162
17:05-17:10	4	57	0	0	0	1	1	0	11	11	68	1	154
17:10-17:15	0	49	0	0	1	1	0	0	16	17	61	1	146
17:15-17:20	1	47	0	1	0	0	1	0	15	10	78	0	153
17:20-17:25	1	54	0	2	0	0	1	0	9	10	71	1	149
17:25-17:30	1	47	0	1	0	2	2	0	9	15	68	0	145
17:30-17:35	1	50	1	0	0	2	3	0	10	16	73	1	157
17:35-17:40	1	39	0	0	2	0	0	0	7	15	57	1	122
17:40-17:45	4	41	0	1	0	0	1	0	6	13	64	1	131
17:45-17:50	3	64	1	3	0	0	0	0	4	16	67	0	158
17:50-17:55	1	54	0	0	0	0	0	0	9	9	44	2	119
17:55-18:00	3	40	0	1	0	0	0	0	8	8	69	2	131
TOTALS	35	1176	13	21	12	10	14	6	219	394	1549	21	3470
PHF	0.7	0.93	0.44	0.39	0.58	0.44	0.38	0.38	0.74	0.76	0.93	0.83	0.96
% Trucks	65.7	6.8	7.7	9.5	0	10	28.6	0	4.1	0.5	3.5	9.5	5.1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			1			1			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: Dlmilm



LOCATION:

TUALATIN-SHERWOOD RD AT CINEMA ENTRANCE
SHERWOOD, OR

Date: **04/10/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

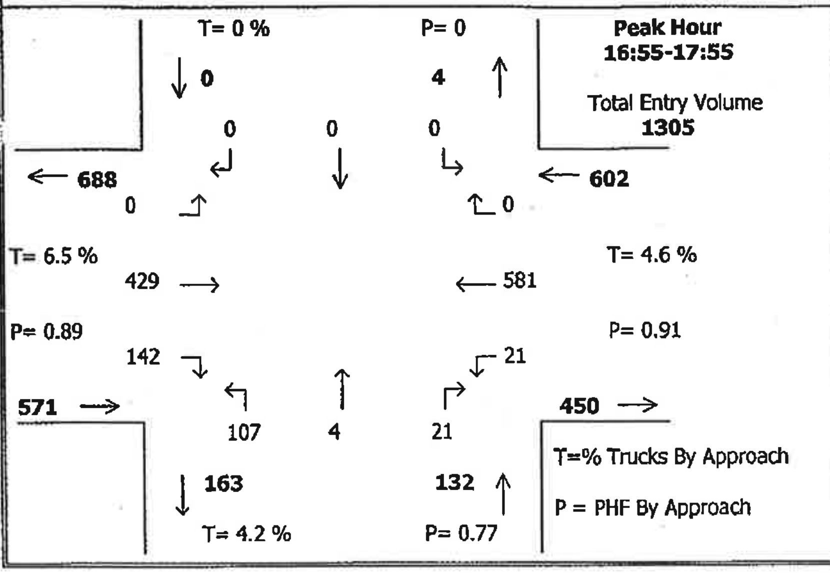
Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	EASTBOUND →	EASTBOUND ⤴	SOUTHBOUND ↲	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↲	WESTBOUND ←	WESTBOUND ↰	ALL
16:00-16:05	10	27	1	2	1	0	13	1	8	8	37	1	109
16:05-16:10	18	61	2	0	0	0	4	0	6	1	32	0	124
16:10-16:15	13	30	2	3	0	0	9	0	8	4	58	2	129
16:15-16:20	26	37	2	9	2	0	8	0	3	4	67	0	158
16:20-16:25	13	46	0	3	0	1	13	1	3	6	61	1	148
16:25-16:30	22	30	2	4	3	0	8	0	9	9	53	0	140
16:30-16:35	16	40	0	2	0	0	11	1	3	6	54	0	133
16:35-16:40	14	42	4	5	0	0	10	2	5	5	70	1	158
16:40-16:45	12	41	3	0	2	1	9	1	6	4	70	0	149
16:45-16:50	11	58	4	1	1	1	11	0	2	2	49	0	140
16:50-16:55	13	41	0	2	1	0	7	1	4	4	72	0	145
16:55-17:00	13	58	3	2	1	1	4	1	5	11	73	1	173
17:00-17:05	11	34	4	2	1	0	20	0	3	14	63	1	153
17:05-17:10	15	58	2	5	0	0	5	0	4	5	58	2	154
17:10-17:15	14	45	1	0	0	0	16	2	8	8	63	1	158
17:15-17:20	27	47	1	2	1	0	6	0	3	15	58	0	160
17:20-17:25	15	45	0	2	1	0	6	1	5	8	67	0	150
17:25-17:30	21	35	0	2	0	0	10	1	4	12	57	0	142
17:30-17:35	13	45	1	2	0	0	10	1	7	9	67	0	155
17:35-17:40	20	37	2	1	1	1	21	0	6	4	49	0	142
17:40-17:45	12	37	0	4	0	0	16	2	2	10	52	1	136
17:45-17:50	17	61	0	0	0	0	10	0	2	9	69	1	169
17:50-17:55	17	42	1	1	1	0	13	0	6	8	41	1	131
17:55-18:00	14	40	3	3	0	1	12	2	5	7	54	0	141

TOTALS	377	1037	38	57	16	6	252	17	117	173	1394	13	3497
PHF	0.71	0.87	0.52	0.69	0.5	0.38	0.7	0.83	0.88	0.69	0.92	0.38	0.96
% Trucks	1.1	10.4	0	0	0	16.7	1.2	0	2.6	2.3	4.2	7.7	5.2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		5			28			3			4		

INTERSECTION TURN MOVEMENT SUMMARY REPORT	File: Jgah



LOCATION:

ROY ROGERS ROAD AT BORCHERS DRIVE
SHERWOOD, OR

Date: **04/10/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

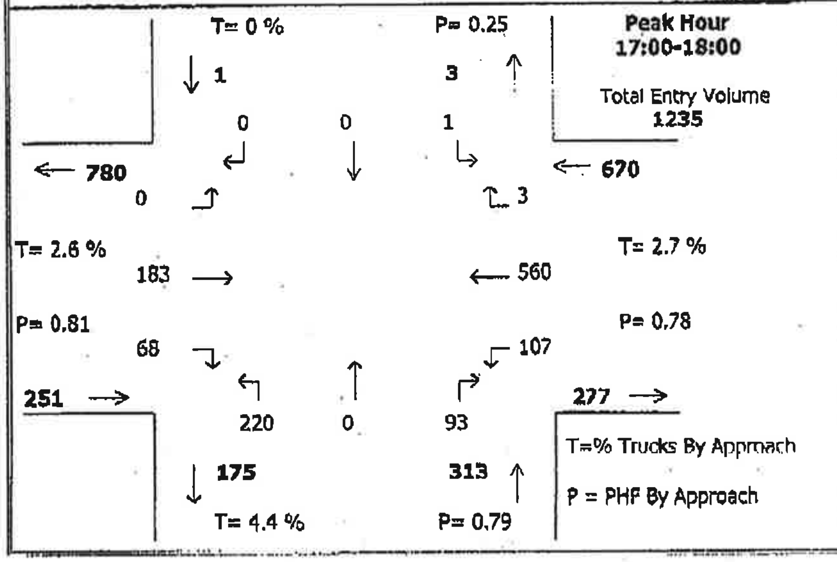
Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			
TIME PERIOD	↴	→	↗	↲	↓	↳	↰	↑	↱	↙	←	↖	ALL
16:00-16:05	6	30	0	0	0	0	10	0	1	2	29	0	78
16:05-16:10	9	25	0	0	0	0	7	0	2	3	49	0	95
16:10-16:15	6	29	0	0	0	0	6	0	1	0	40	0	82
16:15-16:20	4	29	0	0	0	0	9	0	2	1	38	0	83
16:20-16:25	8	19	0	0	0	0	5	0	0	0	53	0	85
16:25-16:30	3	28	0	0	0	0	7	0	0	3	46	0	87
16:30-16:35	15	37	0	0	0	0	4	0	2	2	41	0	101
16:35-16:40	11	30	0	0	0	0	5	0	2	0	48	0	96
16:40-16:45	3	36	0	0	0	0	5	0	1	2	50	0	97
16:45-16:50	7	36	0	0	0	0	11	0	2	1	47	0	104
16:50-16:55	9	31	0	0	0	0	10	0	0	0	47	0	97
16:55-17:00	10	41	0	0	0	0	9	0	4	2	48	0	114
17:00-17:05	13	42	0	0	0	0	6	0	1	2	42	0	106
17:05-17:10	6	38	0	0	0	0	5	0	1	1	47	0	98
17:10-17:15	13	33	0	0	0	0	11	0	0	1	55	0	113
17:15-17:20	12	35	0	0	0	0	10	3	0	2	44	0	106
17:20-17:25	15	39	0	0	0	0	14	0	1	1	63	0	133
17:25-17:30	4	35	0	0	0	0	11	0	0	2	53	0	105
17:30-17:35	10	31	0	0	0	0	10	1	6	0	45	0	103
17:35-17:40	7	26	0	0	0	0	4	0	3	2	58	0	100
17:40-17:45	15	44	0	0	0	0	6	0	2	3	51	0	121
17:45-17:50	20	28	0	0	0	0	8	0	0	2	39	0	97
17:50-17:55	17	37	0	0	0	0	13	0	3	3	36	0	109
17:55-18:00	7	37	0	0	0	0	12	0	2	1	50	0	109

TOTALS	230	796	0	0	0	0	198	4	36	36	1119	0	2419
PHF	0.68	0.89	0	0	0	0	0.76	0.33	0.48	0.66	0.9	0	0.93
% Trucks	2.2	7.8	0	0	0	0	3.5	0	8.3	5.6	4.6	0	5.4
Stopped Buses	0	0	0	0	0	0	0	0	0	0	1	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: Mawhlm



Peak Hour
17:00-18:00

Total Entry Volume
1235

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

OREGON STREET AT TONQUIN ROAD
SHERWOOD, OR

Date: **05/06/03** Day: **TUEue**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

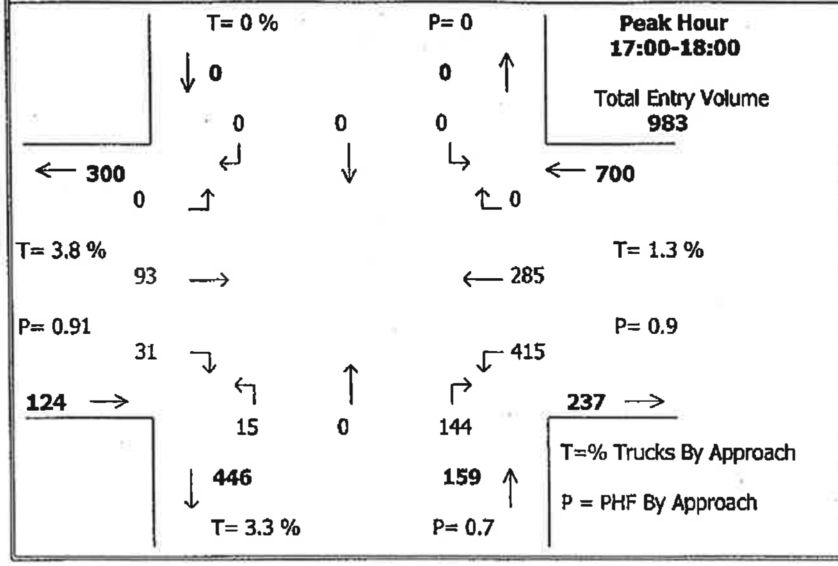
Surveyed By:
TRAFFIC SMITHY,INC
1225 NW Murray Blvd, Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			
TIME PERIOD	↴	→	↱	↵	↓	↳	↰	↑	↱	↲	←	↰	ALL
16:00-16:05	2	9	0	0	0	0	12	0	6	5	27	0	61
16:05-16:10	7	12	0	0	0	0	10	0	6	8	19	0	62
16:10-16:15	0	14	0	0	0	0	12	0	12	7	33	0	78
16:15-16:20	6	12	0	0	0	0	9	0	12	8	26	0	73
16:20-16:25	3	20	0	0	0	0	11	0	7	2	36	0	79
16:25-16:30	4	12	0	0	0	0	13	0	5	5	26	0	65
16:30-16:35	1	7	0	0	0	0	14	0	9	18	37	0	86
16:35-16:40	10	13	0	0	0	1	13	0	10	7	28	0	82
16:40-16:45	4	12	0	0	0	0	14	0	13	14	36	0	93
16:45-16:50	8	19	0	0	0	0	15	0	11	7	45	2	107
16:50-16:55	2	20	0	0	0	0	14	0	4	12	44	0	96
16:55-17:00	2	6	0	0	0	0	11	0	6	9	49	0	83
17:00-17:05	5	17	0	0	0	0	13	0	6	12	42	1	96
17:05-17:10	9	16	0	0	0	1	12	0	1	11	49	0	99
17:10-17:15	6	22	0	0	0	0	26	0	13	3	35	0	105
17:15-17:20	10	14	0	0	0	0	25	0	7	5	43	0	104
17:20-17:25	6	13	0	0	0	0	24	0	4	20	84	0	151
17:25-17:30	2	15	0	0	0	0	15	0	11	19	37	0	99
17:30-17:35	3	18	0	0	0	0	19	0	14	4	51	0	109
17:35-17:40	3	13	0	0	0	0	15	0	5	8	36	0	80
17:40-17:45	9	12	0	0	0	0	14	0	10	5	49	0	99
17:45-17:50	2	11	0	0	0	0	27	0	9	7	41	2	99
17:50-17:55	2	9	0	0	0	0	14	0	9	8	44	0	86
17:55-18:00	11	23	0	0	0	0	16	0	4	5	49	0	108
TOTALS	117	339	0	0	0	2	368	0	194	209	966	5	2200
PHF	0.68	0.83	0	0	0	0.25	0.73	0	0.77	0.61	0.81	0.38	0.86
% Trucks	3.4	2.4	0	0	0	0	1.4	0	10.3	10	1.1	0	3.1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: V6FYGJ.mod



LOCATION:

OREGON STREET AT MURDOCK
SHERWOOD

Date: **4/9/03** Day: **WED**
From: **16:00-18:00**

Report Prepared for:
DKS Associates

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

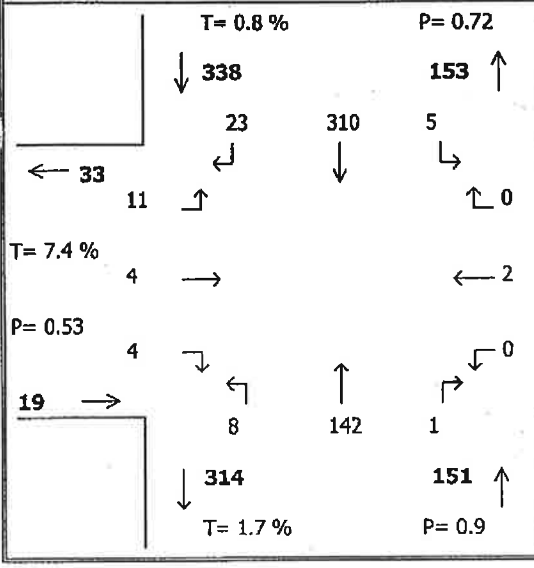
Report Reviewed by: GREG

TIME PERIOD	EASTBOUND ↴	→	⬏	SOUTHBOUND ↲	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ↲	←	⬑	ALL
16:00-16:05	2	6	0	0	0	0	2	0	9	17	13	0	49
16:05-16:10	2	16	0	0	0	0	1	0	14	19	25	0	77
16:10-16:15	2	8	0	0	0	0	2	0	6	17	24	0	59
16:15-16:20	1	13	0	0	0	0	0	0	10	18	25	0	67
16:20-16:25	0	11	0	0	0	0	0	0	3	20	20	0	54
16:25-16:30	2	10	0	0	0	0	0	0	9	22	14	0	57
16:30-16:35	4	11	0	0	0	0	1	0	12	26	35	0	89
16:35-16:40	4	8	0	0	0	0	1	0	9	26	22	0	70
16:40-16:45	1	6	0	0	0	0	1	0	10	23	29	0	70
16:45-16:50	2	11	0	0	0	0	1	0	10	29	26	0	79
16:50-16:55	3	9	0	0	0	0	2	0	7	24	22	0	67
16:55-17:00	2	7	0	0	0	0	2	0	5	31	24	0	71
17:00-17:05	6	8	0	0	0	0	1	0	8	21	12	0	56
17:05-17:10	3	9	0	0	0	0	2	0	13	40	28	0	95
17:10-17:15	2	6	0	0	0	0	1	1	7	28	21	0	65
17:15-17:20	6	8	0	0	0	0	1	0	17	43	29	0	104
17:20-17:25	0	8	0	0	0	0	1	0	10	33	28	0	80
17:25-17:30	0	7	0	0	0	0	2	0	11	32	29	0	81
17:30-17:35	1	6	0	0	0	0	1	0	11	39	29	0	87
17:35-17:40	7	6	0	0	0	0	1	0	7	32	27	0	80
17:40-17:45	0	7	0	0	0	0	2	0	18	37	24	0	88
17:45-17:50	2	9	0	0	0	0	1	0	21	35	19	0	87
17:50-17:55	1	9	0	0	0	0	2	0	13	39	20	0	84
17:55-18:00	3	10	0	0	0	0	0	0	8	36	19	0	76

TOTALS	56	209	0	0	0	0	28	0	248	687	564	0	1792
PHF	0.7	0.83	0	0	0	0	0.75	0	0.69	0.93	0.83	0	0.93
% Trucks	0	4.8	0	0	0	0	0	0	3.6	0.7	2	0	2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: DEAG



Peak Hour
16:40-17:40

Total Entry Volume
510

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

MURDOCK ROAD AT WILLAMETTE STREET
SHERWOOD, OR

Date: **04/15/03** Day: **TUE**
From: **16:00-18:00**

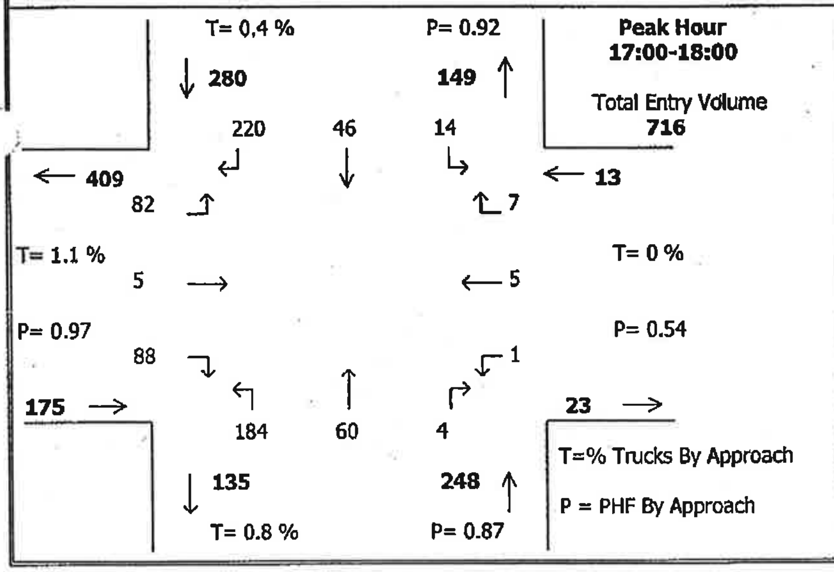
Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	EASTBOUND →	EASTBOUND ↱	SOUTHBOUND ↵	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↲	WESTBOUND ←	WESTBOUND ↰	ALL
16:00-16:05	0	0	0	0	22	0	0	6	0	0	0	0	28
16:05-16:10	0	0	1	3	23	0	0	7	0	0	0	0	34
16:10-16:15	0	0	0	2	20	0	1	13	0	0	0	0	36
16:15-16:20	0	0	0	1	22	0	3	7	1	0	0	0	34
16:20-16:25	0	0	0	1	12	1	1	10	0	0	0	2	27
16:25-16:30	0	0	1	2	18	0	1	10	0	0	0	0	32
16:30-16:35	1	0	0	3	23	0	0	12	0	0	0	0	39
16:35-16:40	1	0	1	1	13	0	0	16	0	0	0	0	32
16:40-16:45	0	0	0	1	21	0	1	17	0	0	0	0	40
16:45-16:50	1	0	1	2	31	1	2	12	0	0	0	0	50
16:50-16:55	0	1	0	0	25	0	0	7	0	0	0	0	33
16:55-17:00	0	0	2	2	18	0	0	12	0	0	0	0	34
17:00-17:05	0	0	0	4	22	1	0	10	0	0	0	0	37
17:05-17:10	0	0	2	2	20	1	0	14	0	0	0	0	39
17:10-17:15	0	1	0	1	24	0	0	13	0	0	0	0	39
17:15-17:20	0	0	0	1	24	1	0	12	0	0	0	0	38
17:20-17:25	0	0	2	3	32	0	2	15	0	0	1	0	55
17:25-17:30	0	0	1	3	33	1	0	10	0	0	1	0	49
17:30-17:35	1	1	1	4	42	0	3	10	0	0	0	0	62
17:35-17:40	2	1	2	0	18	0	0	10	1	0	0	0	34
17:40-17:45	0	0	1	0	13	0	0	18	0	0	0	0	32
17:45-17:50	0	0	1	2	20	0	0	11	1	0	0	0	35
17:50-17:55	0	1	0	2	19	1	0	16	0	0	1	0	40
17:55-18:00	0	0	0	2	32	0	1	10	0	0	0	1	46
TOTALS	6	5	16	42	547	7	15	278	3	0	3	3	925
PHF	0.33	0.5	0.69	0.57	0.72	0.63	0.4	0.89	0.25	0	0.25	0	0.77
% Trucks	0	40	0	0	0.7	14.3	0	1.8	0	0	33.3	0	1.4
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT PEAK HOUR REPORT	File: Blmh



LOCATION:

MURDOCK ROAD AT SUNSET BOULEVARD/MCKINLEY
SHERWOOD, OR

Date: **04/17/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	→	↱	SOUTHBOUND ↲	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ↲	←	↰	ALL
ALL VEHICLES													
17:00-17:15	22	1	22	54	18	4	55	15	0	0	2	0	193
17:15-17:30	22	1	18	60	9	3	56	13	2	0	2	4	190
17:30-17:45	23	1	20	57	9	2	32	17	0	0	1	2	164
17:45-18:00	21	2	22	49	10	5	41	15	2	1	0	1	169
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
17:00-17:15	0	0	0	0	0	0	0	1	0	0	0	0	1
17:15-17:30	1	0	0	1	0	0	0	0	0	0	0	0	2
17:30-17:45	0	0	1	0	0	0	0	0	0	0	0	0	1
17:45-18:00	0	0	0	0	0	0	0	1	0	0	0	0	1
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
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
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	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
17:45-18:00	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0
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

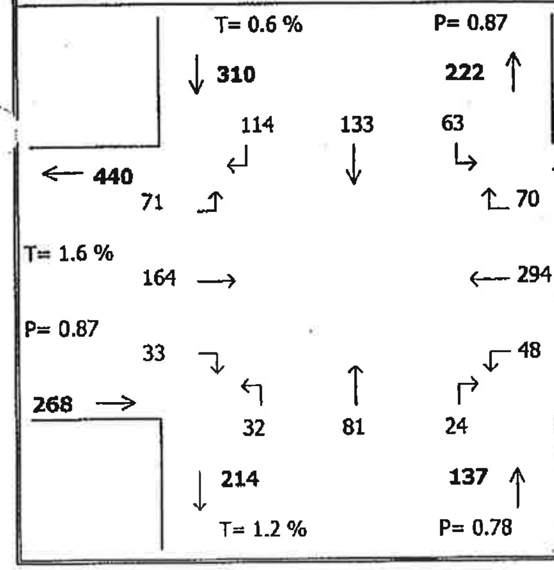
PEDESTRIANS

Crosswalk	SOUTH	WEST	EAST	NORTH	ALL
17:00-17:15	2	0	0	0	2
17:15-17:30	3	0	0	0	3
17:30-17:45	1	0	0	0	1
17:45-18:00	0	3	0	0	3

	EB ↴	EB →	EB ↱	SB ↲	SB ↓	SB ↳	NB ↰	NB ↑	NB ↱	WB ↲	WB ←	WB ↰	ALL
Peak Hour By Movement													
PHF	0.96	0.63	0.93	0.92	0.64	0.7	0.82	0.88	0.5	0.25	0.63	0.44	0.93
% Trucks (All)	1.1	0	1.2	0.5	0	0	0	3.3	0	0	0	0	0.7
% Trucks (M+H)	0	0	0	0	0	0	0	0	0	0	0	0	0
Stopped Busses	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Totals													
16:00-17:00	80	4	60	149	36	10	126	38	1	1	6	4	515
16:15-17:15	91	4	65	170	45	12	148	45	1	1	7	2	591
16:30-17:30	87	5	70	196	45	13	179	52	3	1	8	5	664
16:45-17:45	89	4	76	220	42	13	181	57	2	1	7	6	698
17:00-18:00	88	5	82	220	46	14	184	60	4	1	5	7	716

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: Mfdd



Peak Hour
16:50-17:50

Total Entry Volume
1127

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

SHERWOOD BOULEVARD AT SUNSET BOULEVARD
SHERWOOD, OR

Date: **4/17/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

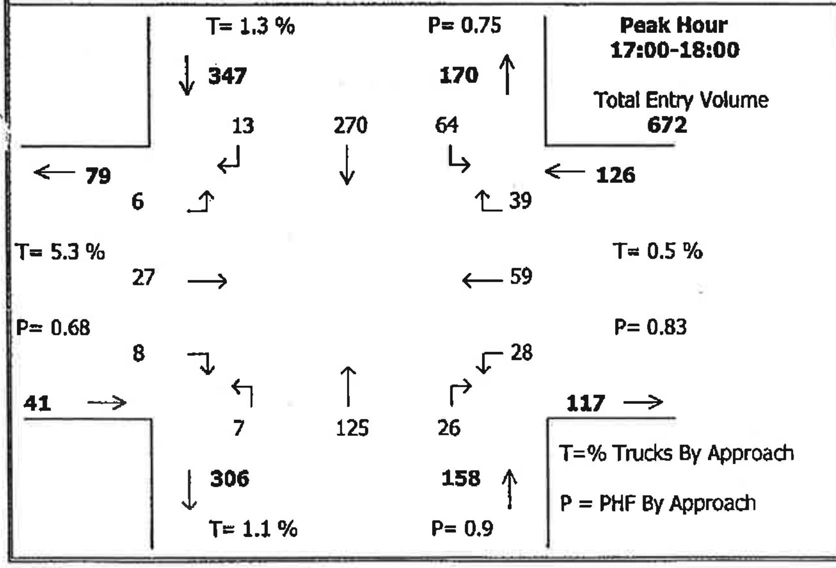
Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

TIME PERIOD	EASTBOUND ⤵	EASTBOUND →	EASTBOUND ⤴	SOUTHBOUND ↲	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↙	WESTBOUND ←	WESTBOUND ↖	ALL
16:00-16:05	5	7	4	3	5	0	0	4	1	4	16	4	53
16:05-16:10	4	7	6	11	13	5	2	3	2	3	11	7	74
16:10-16:15	4	8	1	3	3	4	5	3	1	4	23	2	61
16:15-16:20	3	6	3	1	4	6	3	6	0	6	14	2	54
16:20-16:25	1	14	5	5	8	0	2	4	0	3	10	7	59
16:25-16:30	2	22	2	8	9	2	2	6	0	2	9	5	69
16:30-16:35	3	12	9	6	11	7	2	7	2	4	11	4	78
16:35-16:40	2	11	8	9	10	5	3	9	0	1	17	5	80
16:40-16:45	4	5	12	11	14	3	0	5	3	0	16	6	79
16:45-16:50	6	13	7	2	10	5	4	7	1	6	9	5	75
16:50-16:55	0	14	5	7	11	3	4	6	1	6	18	4	79
16:55-17:00	1	16	8	10	12	5	2	7	3	3	21	12	100
17:00-17:05	5	12	3	10	9	2	4	9	2	4	24	3	87
17:05-17:10	2	14	4	10	12	10	3	1	3	5	27	7	98
17:10-17:15	1	20	9	8	12	10	0	4	3	3	21	5	96
17:15-17:20	6	12	9	10	11	6	0	10	2	7	30	9	112
17:20-17:25	5	11	4	9	12	5	3	9	2	4	31	8	103
17:25-17:30	1	13	5	13	12	5	3	6	2	2	28	8	98
17:30-17:35	5	13	9	9	10	2	6	10	3	3	31	6	107
17:35-17:40	2	14	4	12	7	2	2	7	2	3	19	4	78
17:40-17:45	2	10	5	7	8	6	2	4	1	5	22	2	74
17:45-17:50	3	15	6	9	17	7	3	8	0	3	22	2	95
17:50-17:55	4	7	8	8	4	4	1	7	0	3	17	6	69
17:55-18:00	2	16	8	8	7	1	2	5	2	3	14	4	72

TOTALS	73	292	144	189	231	105	58	147	36	87	461	127	1950
PHF	0.69	0.89	0.81	0.84	0.95	0.61	0.67	0.81	0.75	0.8	0.82	0.7	0.9
% Trucks	2.7	1.4	1.4	0.5	0.4	1	0	1.4	2.8	1.1	1.1	1.6	1.1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		2			4			4			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT	File: Mfcxlm



LOCATION:

ELWERT ROAD AT EDY ROAD
SHERWOOD, OR

Date: **04/10/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

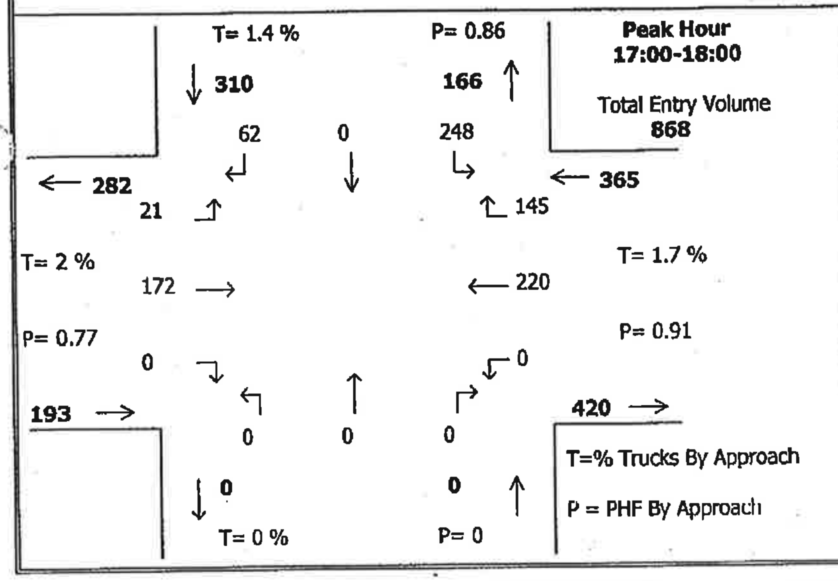
Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			
TIME PERIOD	↴	→	⬏	↲	↓	↳	↰	↑	↱	↙	←	↖	ALL
16:00-16:05	0	4	0	0	16	3	2	10	2	1	2	1	41
16:05-16:10	1	4	0	0	17	2	0	5	3	1	4	4	41
16:10-16:15	0	3	1	2	11	3	0	8	2	2	4	3	39
16:15-16:20	0	2	0	0	5	2	1	9	0	1	4	1	25
16:20-16:25	0	1	0	1	18	4	1	0	4	1	4	2	36
16:25-16:30	0	2	0	0	18	2	0	8	3	2	3	3	41
16:30-16:35	0	3	0	0	18	2	2	7	0	2	3	3	40
16:35-16:40	1	0	0	1	12	6	0	7	0	1	1	1	30
16:40-16:45	1	2	0	0	27	5	1	4	1	2	1	3	47
16:45-16:50	0	0	0	1	14	9	1	6	3	0	3	5	42
16:50-16:55	1	2	0	3	16	8	1	8	0	1	5	2	47
16:55-17:00	1	5	0	0	19	3	0	11	2	1	4	2	48
17:00-17:05	1	1	0	1	19	3	0	7	2	0	3	2	39
17:05-17:10	1	4	1	0	18	4	1	11	1	2	9	5	57
17:10-17:15	0	2	1	1	23	8	0	8	6	1	6	4	60
17:15-17:20	0	5	0	2	17	3	1	10	2	5	3	3	51
17:20-17:25	2	4	1	0	24	7	0	10	1	3	3	6	61
17:25-17:30	0	2	0	1	23	7	1	11	3	2	3	1	54
17:30-17:35	0	2	0	1	16	5	1	3	3	3	9	0	43
17:35-17:40	2	0	0	0	24	5	1	12	4	2	5	2	57
17:40-17:45	1	2	0	2	38	5	1	13	1	4	7	5	79
17:45-17:50	0	2	0	2	32	8	1	9	2	4	4	1	65
17:50-17:55	0	2	3	0	22	4	0	10	1	1	3	4	50
17:55-18:00	1	1	0	3	14	5	0	21	0	1	4	6	56

TOTALS	13	55	7	21	461	113	16	208	46	43	97	69	1149
PHF	0.67	0.61	0.5	0.65	0.72	0.84	0.58	0.78	0.65	0.7	0.7	0.75	0.84
% Trucks	7.7	5.5	0	0	0.9	3.5	0	1.4	0	0	0	1.4	1.4
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: LIATLM



LOCATION:

EDY ROAD AT BORCHERS DRIVE
SHERWOOD, OR

Date: **04/10/03** Day: **THU**
From: **16:05-18:05**

Report Prepared for:
DKS ASSOCIATES

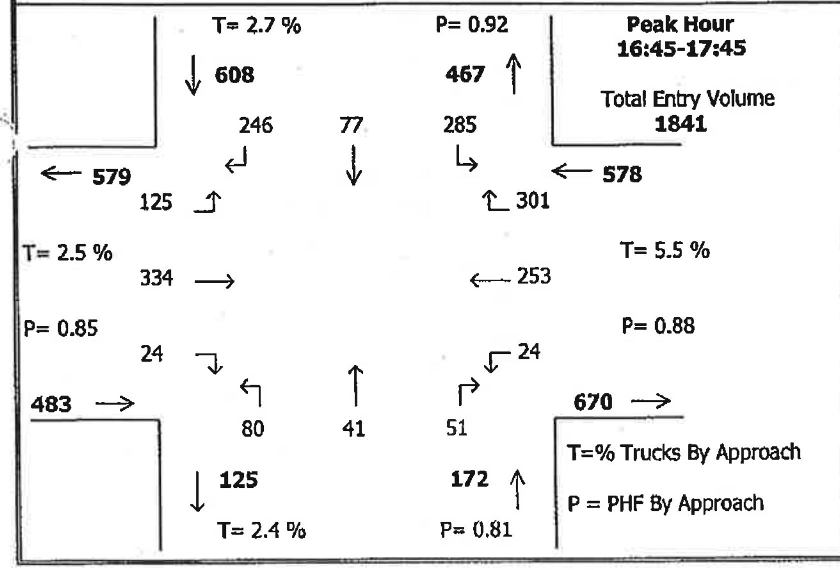
Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

TIME PERIOD	EASTBOUND ⤵	→	⬏	SOUTHBOUND ↲	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ↲	←	⬑	ALL
16:05-16:10	0	10	2	4	0	8	0	0	0	0	13	6	43
16:10-16:15	0	10	1	0	0	13	0	0	0	0	17	6	47
16:15-16:20	0	12	2	4	0	12	0	0	0	0	10	6	46
16:20-16:25	0	11	0	2	0	11	0	0	0	0	17	11	52
16:25-16:30	0	8	4	1	0	17	0	0	0	0	15	9	54
16:30-16:35	0	4	1	2	0	25	0	0	0	0	8	12	52
16:35-16:40	0	12	1	4	0	15	0	0	0	0	14	9	55
16:40-16:45	0	9	4	2	0	16	0	0	0	0	17	8	56
16:45-16:50	0	13	2	0	0	10	0	0	0	0	18	10	53
16:50-16:55	0	19	4	5	1	17	0	0	0	0	18	6	70
16:55-17:00	0	8	2	5	0	18	0	0	0	0	13	8	54
17:00-17:05	0	10	3	10	0	20	0	0	0	0	25	9	77
17:05-17:10	0	20	2	7	0	16	0	0	0	0	23	11	79
17:10-17:15	0	19	4	7	0	20	0	0	0	0	15	17	82
17:15-17:20	0	16	2	2	0	32	0	0	0	0	10	17	79
17:20-17:25	0	16	1	4	0	17	0	0	0	0	16	12	66
17:25-17:30	0	12	0	8	0	18	0	0	0	0	19	13	70
17:30-17:35	0	15	2	2	0	18	0	0	0	0	15	7	59
17:35-17:40	0	14	2	3	0	28	0	0	0	0	23	8	78
17:40-17:45	0	12	0	6	0	26	0	0	0	0	14	13	71
17:45-17:50	0	12	1	6	0	21	0	0	0	0	13	11	64
17:50-17:55	0	12	3	3	0	13	0	0	0	0	24	12	67
17:55-18:00	0	14	1	4	0	19	0	0	0	0	23	15	76
18:00-18:05	0	13	1	3	0	13	0	0	0	0	21	6	57
TOTALS	0	301	45	94	1	423	0	0	0	0	401	242	1507
PHF	0	0.78	0.58	0.65	0	0.83	0	0	0	0	0.87	0.79	0.9
% Trucks	0	2	2.2	0	0	1.7	0	0	0	0	1.2	2.5	1.7
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		1			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: Caillm



LOCATION:

SHERWOOD BOULEVARD AT LANGER DRIVE
SHERWOOD, OR

Date: **04/10/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	EASTBOUND →	EASTBOUND ↗	SOUTHBOUND ↲	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↙	WESTBOUND ←	WESTBOUND ↖	ALL
16:00-16:05	3	19	12	21	4	21	2	4	3	5	17	12	123
16:05-16:10	0	16	6	23	2	28	5	3	1	1	13	20	118
16:10-16:15	1	20	5	30	5	17	12	3	4	3	17	16	133
16:15-16:20	1	26	8	20	5	19	15	5	0	1	13	19	132
16:20-16:25	2	22	7	15	9	37	6	1	1	0	26	18	144
16:25-16:30	2	21	13	15	6	20	6	2	5	3	17	18	128
16:30-16:35	2	28	6	36	6	32	7	0	1	3	12	17	150
16:35-16:40	1	31	10	18	3	19	4	4	2	1	34	22	149
16:40-16:45	1	25	7	34	4	25	6	3	5	2	21	18	151
16:45-16:50	1	23	10	17	5	19	7	2	4	1	19	33	141
16:50-16:55	4	31	11	16	13	29	6	4	1	4	21	27	167
16:55-17:00	2	35	21	15	10	24	4	2	4	1	25	31	174
17:00-17:05	0	28	10	17	1	37	7	2	2	2	24	30	160
17:05-17:10	2	26	9	27	9	18	5	5	2	3	23	24	153
17:10-17:15	2	25	14	23	6	28	8	9	5	0	20	13	153
17:15-17:20	4	25	5	17	7	25	8	3	7	2	18	25	146
17:20-17:25	2	30	10	29	1	24	3	3	7	2	19	19	149
17:25-17:30	0	27	10	19	6	21	4	5	2	0	25	26	145
17:30-17:35	4	18	9	21	3	17	10	1	8	4	16	26	137
17:35-17:40	3	29	7	20	6	22	9	4	3	4	20	25	152
17:40-17:45	0	37	9	25	10	21	9	1	6	1	23	22	164
17:45-17:50	3	24	4	15	3	25	7	3	6	2	17	17	126
17:50-17:55	0	31	12	16	3	21	11	3	5	0	32	18	152
17:55-18:00	0	28	9	22	1	20	6	1	6	6	23	15	137

TOTALS	40	625	224	511	128	569	167	73	90	51	495	511	3484
PHF	0.75	0.89	0.74	0.89	0.69	0.79	0.71	0.6	0.67	0.67	0.88	0.83	0.92
% Trucks	0	3.4	0.4	1.2	0.8	4.6	2.4	0	4.4	2	6.9	4.5	3.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		9			0			5			5		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: LIAU36

T= 1.8 %
P= 0.92
684 ↓
543 ↑
43 541 100
← 66
25
58
← 89
T= 1.4 %
13 →
← 3
T= 0.6 %
P= 0.57
P= 0.79
42
28
80 →
20 460 34
147 →
↓ 611
514 ↑
T= 1.4 %
P= 0.86

Peak Hour
16:55-17:55

Total Entry Volume
1367

T=% Trucks By Approach
P = PHF By Approach

LOCATION:
CENTURY DRIVE AT N SHERWOOD BOULEVARD
SHERWOOD, OR

Date: **04/16/03** Day: **WED**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

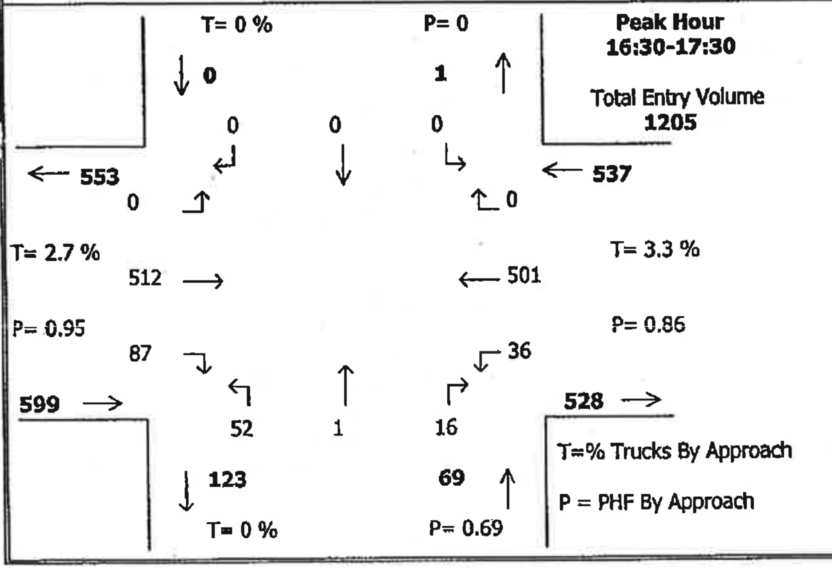
Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			
TIME PERIOD	↴	→	⤴	↲	↓	↳	↰	↑	↱	↙	←	↖	ALL
16:00-16:05	1	0	0	1	28	7	1	40	0	3	0	7	88
16:05-16:10	3	2	0	2	38	7	1	29	1	3	0	4	90
16:10-16:15	1	0	4	2	26	5	2	25	1	0	0	7	73
16:15-16:20	4	0	2	6	38	7	2	37	2	1	1	3	103
16:20-16:25	0	0	2	5	50	5	1	25	5	1	0	4	98
16:25-16:30	1	1	0	3	35	6	0	35	2	0	0	7	90
16:30-16:35	2	0	3	2	43	8	2	44	3	1	1	5	114
16:35-16:40	4	1	2	2	46	5	2	34	1	2	1	6	106
16:40-16:45	3	1	0	5	26	3	5	34	2	0	0	3	82
16:45-16:50	3	1	1	0	47	5	2	39	2	3	0	4	107
16:50-16:55	7	2	2	2	37	10	3	46	2	5	0	5	121
16:55-17:00	3	0	0	7	34	10	1	54	3	3	1	6	122
17:00-17:05	1	0	1	7	31	6	1	35	3	1	0	5	91
17:05-17:10	4	0	1	3	53	10	0	35	6	0	0	0	112
17:10-17:15	2	2	1	6	46	10	5	26	1	2	0	1	102
17:15-17:20	0	1	3	3	38	8	5	33	0	2	1	8	102
17:20-17:25	10	0	7	2	50	13	1	46	3	0	0	9	141
17:25-17:30	3	4	2	3	42	9	0	46	3	3	0	5	120
17:30-17:35	3	2	4	5	56	5	2	48	1	3	0	4	133
17:35-17:40	2	1	2	2	41	3	2	34	4	6	0	4	101
17:40-17:45	5	2	1	1	40	6	1	30	3	1	0	5	95
17:45-17:50	3	0	3	4	57	12	1	34	0	4	0	5	123
17:50-17:55	6	1	0	0	53	8	1	39	7	3	1	6	125
17:55-18:00	5	2	0	0	47	13	1	23	2	3	0	8	104

TOTALS	76	23	41	73	1002	181	42	871	57	50	6	121	2543
PHF	0.66	0.46	0.48	0.63	0.9	0.81	0.45	0.82	0.71	0.58	0.75	0.66	0.87
% Trucks	1.3	0	2.4	0	2.1	1.1	0	1.6	0	0	0	0.8	1.6
Stopped Buses	0	0	0	0	5	0	0	0	0	0	0	0	
Pedestrians		11			9			36			13		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: Jgan



LOCATION:

SHERWOOD BLVD/ PINE STREET AT 3RD STREET
SHERWOOD, OR

Date: **04/17/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

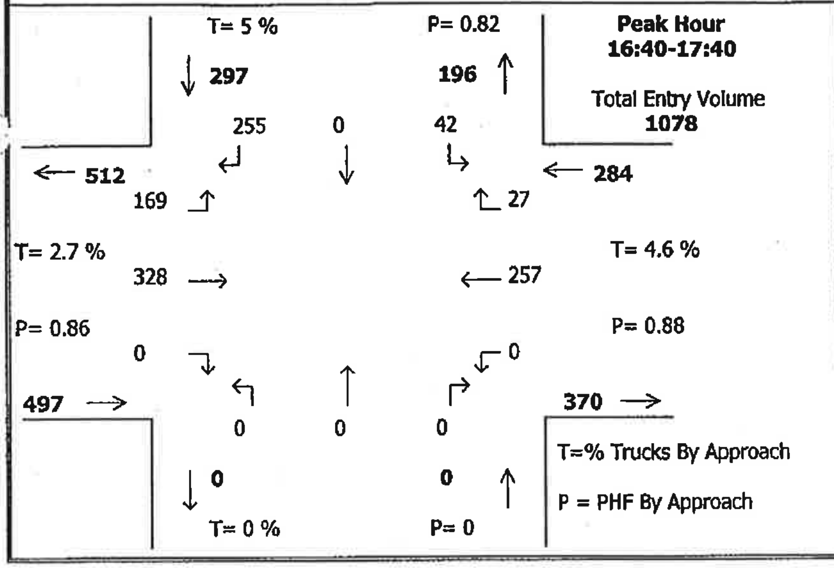
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ⤵	EASTBOUND →	EASTBOUND ⤴	SOUTHBOUND ↲	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↙	WESTBOUND ←	WESTBOUND ↖	ALL
16:00-16:05	5	16	0	0	0	0	1	0	5	2	33	0	62
16:05-16:10	5	31	1	0	0	0	2	0	0	3	26	0	68
16:10-16:15	6	36	0	0	0	0	0	0	1	4	33	0	80
16:15-16:20	5	26	0	0	0	0	2	0	1	2	32	0	68
16:20-16:25	5	36	0	0	0	0	1	0	1	2	41	0	86
16:25-16:30	4	40	0	0	0	0	1	0	2	1	30	0	78
16:30-16:35	7	41	0	0	0	0	3	0	0	2	37	0	90
16:35-16:40	7	41	0	0	0	0	6	0	1	0	44	0	99
16:40-16:45	8	41	0	0	0	0	6	0	2	2	54	0	113
16:45-16:50	8	38	0	0	0	0	7	1	2	4	42	0	102
16:50-16:55	11	38	0	0	0	0	3	0	0	2	39	0	93
16:55-17:00	7	51	0	0	0	0	4	0	1	2	42	0	107
17:00-17:05	4	47	0	0	0	0	4	0	5	4	40	0	104
17:05-17:10	5	41	0	0	0	0	11	0	0	3	30	0	90
17:10-17:15	8	40	0	0	0	0	0	0	1	6	45	0	100
17:15-17:20	4	45	0	0	0	0	1	0	1	2	45	0	98
17:20-17:25	8	38	0	0	0	0	4	0	1	6	52	0	109
17:25-17:30	10	51	0	0	0	0	3	0	2	3	31	0	100
17:30-17:35	6	32	0	0	0	0	3	0	1	2	37	0	81
17:35-17:40	7	46	0	0	0	0	3	0	0	3	39	0	98
17:40-17:45	7	43	0	0	0	0	6	0	0	3	42	0	101
17:45-17:50	5	22	0	0	0	0	8	0	1	4	47	0	87
17:50-17:55	5	46	0	0	0	0	3	0	1	3	48	0	106
17:55-18:00	9	51	0	0	0	0	6	0	0	2	39	0	107

TOTALS	156	937	1	0	0	0	88	1	29	67	948	0	2227
PHF	0.81	0.92	0	0	0	0	0.68	0.25	0.67	0.64	0.88	0	0.96
% Trucks	0	3.2	0	0	0	0	0	0	0	1.5	3.5	0	2.9
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			2			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: DgwhLM.mod



Peak Hour
16:40-17:40

Total Entry Volume
1078

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

PINE ST/SHERWOOD BLVD AT OREGON STREET
SHERWOOD, OR

Date: **04/08/03** Day: **TUE**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

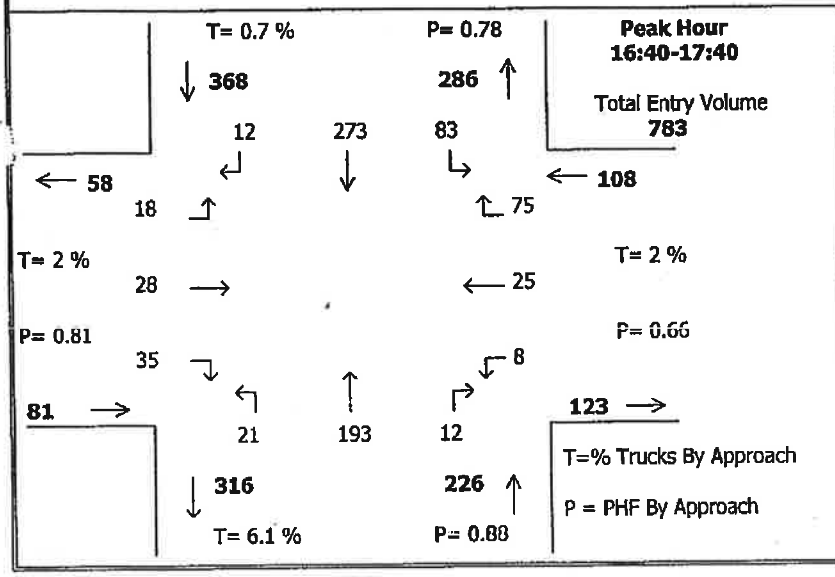
Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			
TIME PERIOD	⤵	→	⤴	↲	↓	↳	↰	↑	↱	↲	←	↰	ALL
16:00-16:05	0	26	14	15	0	2	0	0	0	0	17	2	76
16:05-16:10	0	13	18	14	0	2	0	0	0	0	18	2	67
16:10-16:15	0	14	10	10	0	4	0	0	0	0	9	1	48
16:15-16:20	0	18	7	20	0	2	0	0	0	0	24	3	74
16:20-16:25	0	29	10	13	0	0	0	0	0	0	23	4	79
16:25-16:30	0	24	11	18	0	1	0	0	0	0	16	2	72
16:30-16:35	0	24	6	22	0	10	0	0	0	0	18	1	81
16:35-16:40	0	26	16	17	0	3	0	0	0	0	22	3	87
16:40-16:45	0	16	10	29	0	1	0	0	0	0	21	1	78
16:45-16:50	0	36	19	17	0	6	0	0	0	0	27	3	108
16:50-16:55	0	34	16	31	0	6	0	0	0	0	23	2	112
16:55-17:00	0	29	11	20	0	7	0	0	0	0	22	1	90
17:00-17:05	0	32	19	14	0	2	0	0	0	0	24	3	94
17:05-17:10	0	29	17	20	0	3	0	0	0	0	20	1	90
17:10-17:15	0	21	14	8	0	0	0	0	0	0	9	3	55
17:15-17:20	0	26	11	30	0	4	0	0	0	0	25	3	99
17:20-17:25	0	22	6	22	0	3	0	0	0	0	21	3	77
17:25-17:30	0	20	10	25	0	2	0	0	0	0	25	4	86
17:30-17:35	0	38	10	24	0	4	0	0	0	0	18	2	96
17:35-17:40	0	25	26	15	0	4	0	0	0	0	22	1	93
17:40-17:45	0	30	6	14	0	3	0	0	0	0	19	3	75
17:45-17:50	0	24	10	13	0	6	0	0	0	0	20	1	74
17:50-17:55	0	24	6	16	0	1	0	0	0	0	24	1	72
17:55-18:00	0	22	16	16	0	0	0	0	0	0	26	3	83

TOTALS	0	602	299	443	0	76	0	0	0	0	493	53	1966
PHF	0	0.83	0.85	0.83	0	0.55	0	0	0	0	0.89	0.68	0.87
% Trucks	0	1.2	5.4	2.9	0	11.8	0	0	0	0	3.4	7.5	4.1
Stopped Buses	0	0	0	0	0	1	0	0	0	0	0	0	
Pedestrians		5			12			15			7		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: DlmeLM



LOCATION:

WASHINGTON STREET AT RAILROAD STREET
SHERWOOD, OR

Date: **04/08/03** Day: **TUE**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

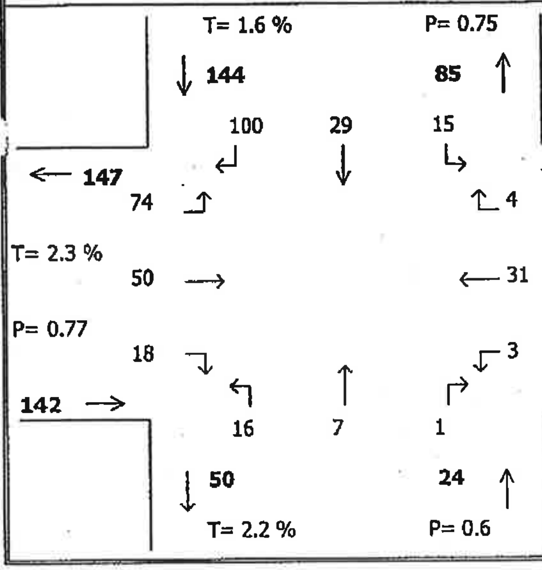
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	EASTBOUND →	EASTBOUND ⬏	SOUTHBOUND ↲	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↙	WESTBOUND ←	WESTBOUND ⬑	ALL
16:00-16:05	3	5	3	1	22	4	4	17	1	2	1	6	69
16:05-16:10	1	4	0	0	9	4	3	11	1	1	3	4	41
16:10-16:15	1	2	0	2	13	9	2	13	0	1	3	3	49
16:15-16:20	6	4	0	0	10	8	3	22	1	0	3	3	60
16:20-16:25	1	2	1	2	17	5	2	10	1	1	4	8	54
16:25-16:30	4	4	0	1	18	11	2	15	0	0	2	4	61
16:30-16:35	2	2	1	1	25	9	0	19	1	3	1	3	67
16:35-16:40	1	3	1	1	18	5	1	18	0	2	3	6	59
16:40-16:45	3	1	1	0	19	3	1	17	0	0	0	7	52
16:45-16:50	0	1	0	2	25	14	4	16	1	1	0	7	71
16:50-16:55	6	1	2	5	32	4	4	16	4	1	4	6	85
16:55-17:00	2	2	3	1	28	7	4	12	1	1	1	11	73
17:00-17:05	1	4	4	1	22	10	1	18	1	3	6	8	79
17:05-17:10	3	2	1	0	22	8	1	13	0	0	4	3	57
17:10-17:15	1	1	0	0	8	3	1	5	0	0	2	2	23
17:15-17:20	2	4	2	1	23	8	0	27	2	1	6	9	85
17:20-17:25	2	6	1	0	21	7	0	13	2	1	1	13	67
17:25-17:30	4	0	3	2	23	4	3	17	0	0	0	6	62
17:30-17:35	6	0	1	0	26	10	2	16	1	0	0	0	62
17:35-17:40	5	6	0	0	24	5	0	23	0	0	1	3	67
17:40-17:45	0	0	1	1	21	9	1	12	0	0	0	5	50
17:45-17:50	2	1	2	0	14	14	0	19	1	1	0	9	63
17:50-17:55	0	2	1	1	16	10	1	13	2	0	2	8	56
17:55-18:00	6	2	1	1	13	7	2	17	0	0	0	4	53

TOTALS	62	59	29	23	469	178	42	379	20	19	47	138	1465
PHF	0.58	0.64	0.5	0.38	0.8	0.83	0.44	0.85	0.5	0.4	0.52	0.67	0.83
% Trucks	0	3.4	3.4	0	0.9	0.6	4.8	6.3	5	0	6.4	0.7	2.7
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		1			74			9			48		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: MKJO



Peak Hour
16:30-17:30

Total Entry Volume
348

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

WASHINGTON STREET AT 3RD STREET
SHERWOOD, OR

Date: **04/15/03** Day: **TUE**
From: **16:05-18:05**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

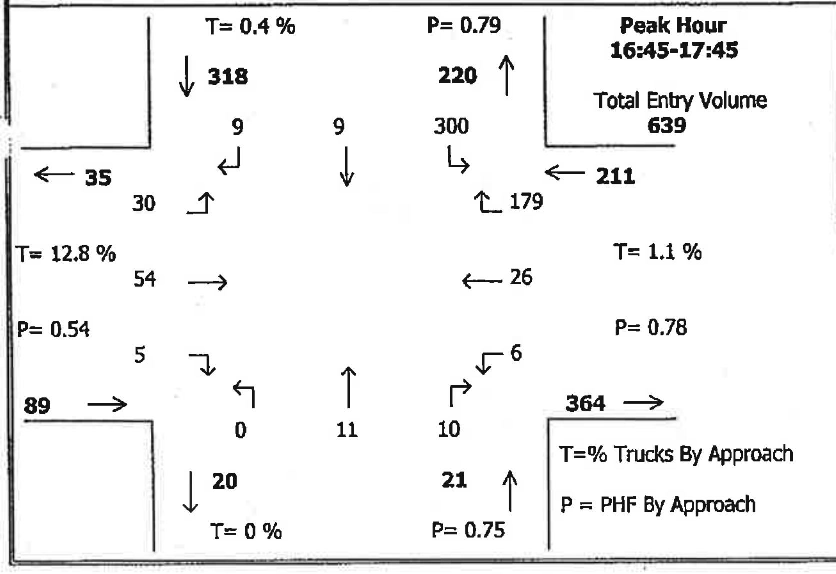
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↘	EASTBOUND →	EASTBOUND ↗	SOUTHBOUND ↲	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↙	WESTBOUND ←	WESTBOUND ↖	ALL
16:05-16:10	0	7	10	3	2	0	0	0	0	0	4	1	27
16:10-16:15	0	1	6	4	2	1	3	1	0	0	1	0	19
16:15-16:20	0	5	7	6	2	0	2	0	0	0	1	0	23
16:20-16:25	0	2	7	6	5	0	0	0	0	0	3	0	23
16:25-16:30	0	2	2	4	1	1	1	1	0	0	4	0	16
16:30-16:35	2	5	8	10	4	0	2	0	0	1	1	1	34
16:35-16:40	1	4	6	8	3	2	1	0	0	1	2	1	29
16:40-16:45	0	0	8	13	4	2	2	1	0	0	2	1	33
16:45-16:50	0	5	2	9	5	2	0	1	0	0	1	0	25
16:50-16:55	3	4	6	11	0	0	2	1	0	0	6	0	33
16:55-17:00	2	9	8	11	2	1	1	0	0	0	3	0	37
17:00-17:05	1	4	5	10	2	3	4	1	1	0	3	0	34
17:05-17:10	2	4	2	4	2	1	1	2	0	0	4	1	23
17:10-17:15	2	1	2	6	0	0	1	0	0	1	2	0	15
17:15-17:20	2	6	12	10	2	3	1	0	0	0	5	0	41
17:20-17:25	1	4	8	3	2	0	0	0	0	0	1	0	19
17:25-17:30	2	4	7	5	3	1	1	1	0	0	1	0	25
17:30-17:35	3	3	2	9	5	1	0	0	0	0	3	0	26
17:35-17:40	1	3	7	6	0	0	1	0	0	0	2	0	20
17:40-17:45	1	9	3	9	0	2	0	0	0	0	5	1	30
17:45-17:50	1	8	6	3	5	1	1	1	0	0	0	0	26
17:50-17:55	0	2	4	15	2	0	2	1	0	0	1	0	27
17:55-18:00	0	4	9	6	1	2	2	0	0	0	1	0	25
18:00-18:05	0	1	2	4	3	1	4	0	1	0	4	0	20

TOTALS	24	97	139	175	57	24	32	11	2	3	60	6	630
PHF	0.75	0.69	0.69	0.76	0.6	0.63	0.57	0.58	0.25	0.38	0.65	0.33	0.84
% Trucks	4.2	3.1	1.4	1.1	1.8	4.2	3.1	0	0	0	5	0	2.2
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		24			20			2			3		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: Ltir



LOCATION:

RAILROAD STREET AT SHERWOOD BOULEVARD
SHERWOOD, OR

Date: **04/08/03** Day: **TUE**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

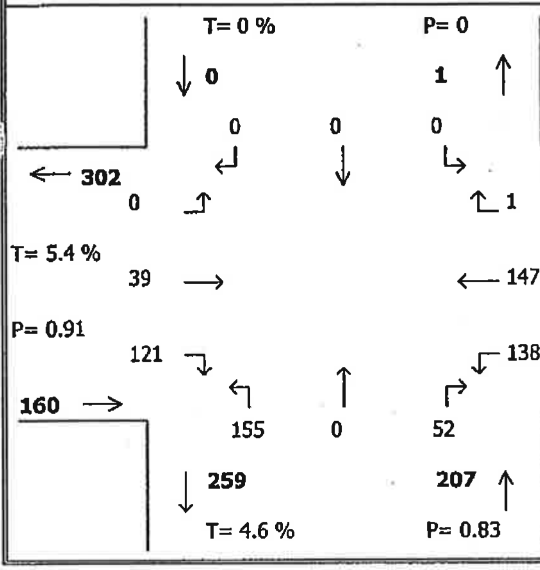
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	EASTBOUND →	EASTBOUND ⤴	SOUTHBOUND ↲	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↙	WESTBOUND ←	WESTBOUND ↖	ALL
16:00-16:05	1	4	1	2	3	14	0	5	1	0	5	13	49
16:05-16:10	0	2	1	2	1	18	0	1	2	2	2	12	43
16:10-16:15	0	3	3	0	0	11	0	0	0	1	2	10	30
16:15-16:20	0	3	3	1	1	13	0	1	0	0	5	22	49
16:20-16:25	0	3	1	2	0	21	0	2	1	0	2	14	46
16:25-16:30	0	1	0	1	1	14	0	2	2	0	3	15	39
16:30-16:35	0	2	2	1	3	22	0	1	0	1	3	16	51
16:35-16:40	0	3	1	2	2	22	0	1	1	0	3	15	50
16:40-16:45	1	3	1	3	1	18	0	0	0	0	2	17	46
16:45-16:50	0	2	0	0	1	22	0	0	1	0	2	23	51
16:50-16:55	0	3	3	2	0	30	0	0	1	1	2	18	60
16:55-17:00	2	5	2	2	3	33	0	0	0	0	4	18	69
17:00-17:05	1	5	2	1	0	30	0	4	1	0	1	11	56
17:05-17:10	0	4	1	0	0	25	0	0	0	0	1	14	45
17:10-17:15	0	0	2	0	0	10	0	1	1	1	1	6	22
17:15-17:20	1	15	2	1	2	26	0	1	1	1	3	24	77
17:20-17:25	0	10	7	0	1	24	0	1	2	1	3	7	56
17:25-17:30	0	4	2	1	1	22	0	0	1	0	2	16	49
17:30-17:35	0	1	4	0	1	29	0	1	0	2	2	16	56
17:35-17:40	1	3	2	2	0	24	0	0	1	0	2	16	51
17:40-17:45	0	2	3	0	0	25	0	3	1	0	3	10	47
17:45-17:50	0	5	0	1	2	14	0	0	1	0	6	14	43
17:50-17:55	1	1	1	0	1	16	0	1	0	0	2	17	40
17:55-18:00	0	4	1	0	0	18	0	0	0	1	0	20	44

TOTALS	8	88	45	24	24	501	0	25	18	11	61	364	1169
PHF	0.42	0.47	0.58	0.45	0.56	0.81	0	0.55	0.63	0.5	0.81	0.76	0.86
% Trucks	0	1.1	37.8	0	0	0.4	0	0	0	0	0	1.4	2.1
Stopped Buses	0	1	0	0	0	0	0	0	0	0	0	0	
Pedestrians		56			90			2			9		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: LiavLM



Peak Hour
16:05-17:05

Total Entry Volume
653

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

CIPOLE ROAD AT HERMAN ROAD
SHERWOOD, OR

Date: **04/17/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

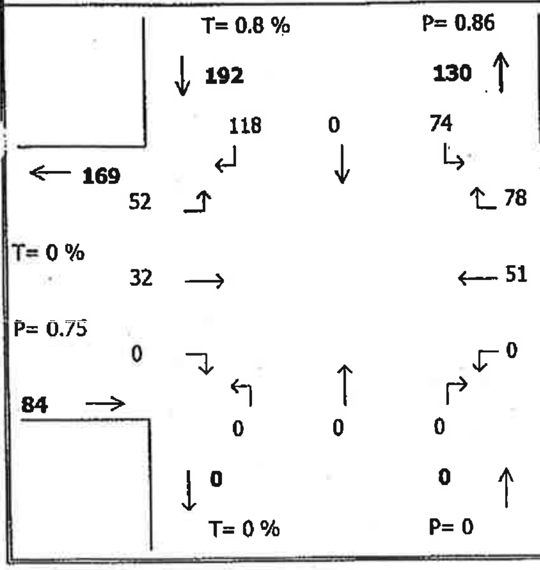
Report Reviewed by: JG

TIME PERIOD	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			ALL
	⤵	→	⤴	↲	↓	↳	↰	↑	↱	↲	←	↰	
16:00-16:05	9	5	0	0	0	0	5	0	0	12	18	3	52
16:05-16:10	5	6	0	0	0	0	19	0	1	11	12	0	54
16:10-16:15	11	3	0	0	0	0	14	0	7	12	10	1	58
16:15-16:20	13	3	0	0	0	0	9	0	4	7	9	0	45
16:20-16:25	6	3	0	0	0	0	10	0	5	8	9	0	41
16:25-16:30	16	3	0	0	0	0	7	0	4	15	14	0	59
16:30-16:35	9	1	0	0	0	0	23	0	4	9	19	0	65
16:35-16:40	12	2	0	0	0	0	10	0	0	15	12	0	51
16:40-16:45	9	1	0	0	0	0	10	0	7	12	11	0	50
16:45-16:50	10	3	0	0	0	0	5	0	6	12	11	0	47
16:50-16:55	7	4	0	0	0	0	9	0	4	11	10	0	45
16:55-17:00	10	5	0	0	0	0	18	0	6	12	13	0	64
17:00-17:05	13	5	0	0	0	0	21	0	4	14	17	0	74
17:05-17:10	5	0	0	0	0	0	9	0	5	10	15	0	44
17:10-17:15	12	3	0	0	0	0	9	0	8	5	13	0	50
17:15-17:20	7	1	0	0	0	0	7	0	1	12	14	0	42
17:20-17:25	12	2	0	0	0	0	7	0	4	5	16	0	46
17:25-17:30	9	5	0	0	0	0	12	0	6	14	14	0	60
17:30-17:35	18	3	0	0	0	0	9	0	3	7	10	0	50
17:35-17:40	6	1	0	0	0	0	9	0	2	7	8	0	33
17:40-17:45	12	2	0	0	0	0	14	0	4	13	11	0	56
17:45-17:50	9	2	0	0	0	0	7	0	2	6	7	0	33
17:50-17:55	4	2	0	0	0	0	8	0	1	8	9	0	32
17:55-18:00	4	3	0	0	0	0	4	0	2	4	12	0	29

TOTALS	228	68	0	0	0	0	255	0	90	241	294	4	1180
PHF	0.82	0.7	0	0	0	0	0.81	0	0.76	0.88	0.82	0.25	0.89
% Trucks	4.4	8.8	0	0	0	0	3.1	0	8.9	3.3	4.1	50	4.6
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			1			1			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: V6FZ.mod



Peak Hour
16:50-17:50

Total Entry Volume
405

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

MEINECKE @ DEWEY
SHERWOOD

Date: **04/09/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

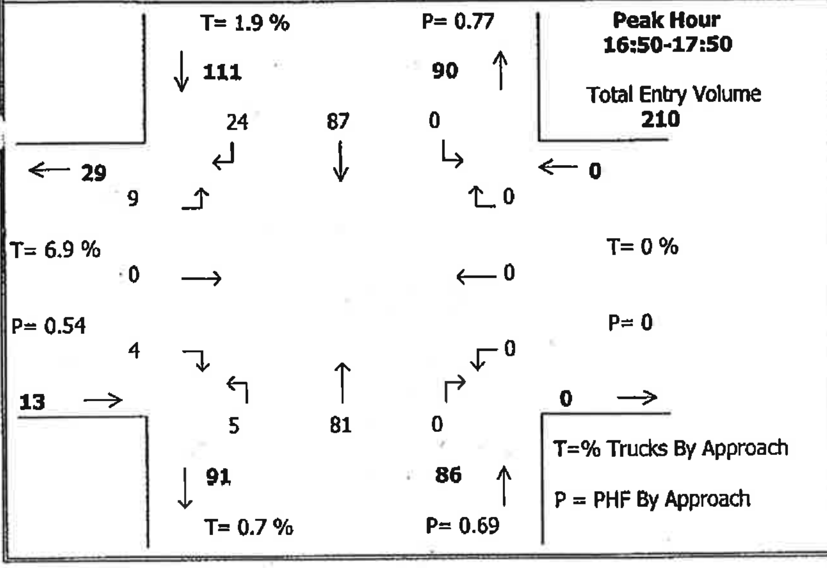
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ⤵	EASTBOUND →	EASTBOUND ⤴	SOUTHBOUND ↲	SOUTHBOUND ↓	SOUTHBOUND ↳	NORTHBOUND ↰	NORTHBOUND ↑	NORTHBOUND ↱	WESTBOUND ↲	WESTBOUND ←	WESTBOUND ↰	ALL
16:00-16:05	0	5	4	5	0	6	0	0	0	0	1	6	27
16:05-16:10	0	3	3	7	0	4	0	0	0	0	2	15	34
16:10-16:15	0	4	8	8	0	6	0	0	0	0	1	10	37
16:15-16:20	0	3	7	5	0	7	0	0	0	0	3	5	30
16:20-16:25	0	2	5	6	0	9	0	0	0	0	1	9	32
16:25-16:30	0	2	4	4	0	5	0	0	0	0	2	7	24
16:30-16:35	0	1	8	8	0	7	0	0	0	0	4	3	31
16:35-16:40	0	2	0	11	0	11	0	0	0	0	5	6	35
16:40-16:45	0	3	10	3	0	10	0	0	0	0	2	8	36
16:45-16:50	0	2	5	5	0	6	0	0	0	0	0	2	20
16:50-16:55	0	3	5	6	0	12	0	0	0	0	2	5	33
16:55-17:00	0	3	4	4	0	8	0	0	0	0	4	4	27
17:00-17:05	0	4	1	6	0	3	0	0	0	0	2	9	25
17:05-17:10	0	1	5	7	0	8	0	0	0	0	3	8	32
17:10-17:15	0	5	6	12	0	6	0	0	0	0	8	12	49
17:15-17:20	0	4	4	6	0	6	0	0	0	0	2	6	28
17:20-17:25	0	3	6	11	0	6	0	0	0	0	5	5	36
17:25-17:30	0	1	3	15	0	7	0	0	0	0	3	10	39
17:30-17:35	0	3	5	8	0	5	0	0	0	0	5	6	32
17:35-17:40	0	1	2	16	0	3	0	0	0	0	8	4	34
17:40-17:45	0	3	9	16	0	7	0	0	0	0	3	4	42
17:45-17:50	0	1	2	11	0	3	0	0	0	0	6	5	28
17:50-17:55	0	0	3	12	0	6	0	0	0	0	3	6	30
17:55-18:00	0	2	2	9	0	7	0	0	0	0	3	7	30

TOTALS	0	61	111	201	0	158	0	0	0	0	78	162	771
PHF	0	0.67	0.81	0.69	0	0.8	0	0	0	0	0.75	0.67	0.9
% Trucks	0	0	0	0	0	1.9	0	0	0	0	1.3	2.5	1
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: DjziLM



LOCATION:

BROOKMAN ROAD AT LADD HILL ROAD
SHERWOOD, OR

Date: **04/17/03** Day: **THU**
From: **16:00-18:00**

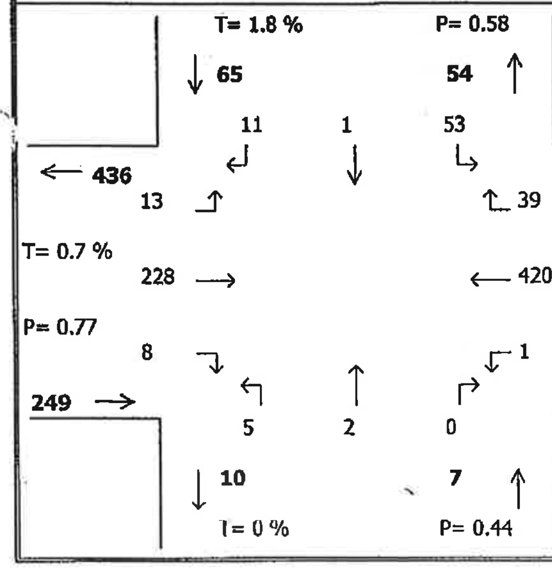
Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	→	⤴	SOUTHBOUND ↲	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ↙	←	↰	ALL
16:00-16:05	0	0	2	1	7	0	1	3	0	0	0	0	14
16:05-16:10	0	0	2	1	8	0	0	3	0	0	0	0	14
16:10-16:15	0	0	1	3	5	0	0	8	0	0	0	0	17
16:15-16:20	0	0	1	3	4	0	2	5	0	0	0	0	15
16:20-16:25	0	0	1	4	6	0	0	3	0	0	0	0	14
16:25-16:30	1	0	2	5	7	0	0	8	0	0	0	0	23
16:30-16:35	0	0	2	2	0	0	2	7	0	0	0	0	13
16:35-16:40	2	0	0	2	9	0	0	1	0	0	0	0	14
16:40-16:45	0	0	1	1	8	0	0	5	0	0	0	0	15
16:45-16:50	0	0	0	1	7	0	0	3	0	0	0	0	11
16:50-16:55	1	0	0	4	9	0	0	4	0	0	0	0	18
16:55-17:00	0	0	2	4	5	0	0	7	0	0	0	0	18
17:00-17:05	1	0	2	2	8	0	0	2	0	0	0	0	15
17:05-17:10	0	0	0	0	6	0	1	5	0	0	0	0	12
17:10-17:15	0	0	0	2	9	0	1	7	0	0	0	0	19
17:15-17:20	2	0	2	2	14	0	1	7	0	0	0	0	28
17:20-17:25	0	0	0	2	6	0	0	7	0	0	0	0	15
17:25-17:30	0	0	1	1	11	0	0	14	0	0	0	0	27
17:30-17:35	0	0	1	1	3	0	0	10	0	0	0	0	15
17:35-17:40	0	0	0	2	3	0	0	3	0	0	0	0	8
17:40-17:45	0	0	0	2	11	0	1	5	0	0	0	0	19
17:45-17:50	0	0	1	2	2	0	1	10	0	0	0	0	16
17:50-17:55	1	0	0	1	4	0	2	5	0	0	0	0	13
17:55-18:00	0	0	0	0	6	0	0	4	0	0	0	0	10
TOTALS	8	0	21	48	158	0	12	136	0	0	0	0	383
PHF	0.5	0	0.56	0.6	0.7	0	0.42	0.65	0	0	0	0	0.75
% Trucks	12.5	0	4.8	0	2.5	0	0	0.7	0	0	0	0	1.8
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT	File: Ltja



Peak Hour
16:50-17:50

Total Entry Volume
781

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

SUNSET BOULEVARD AT PINE STREET
SHERWOOD, OR

Date: **04/17/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

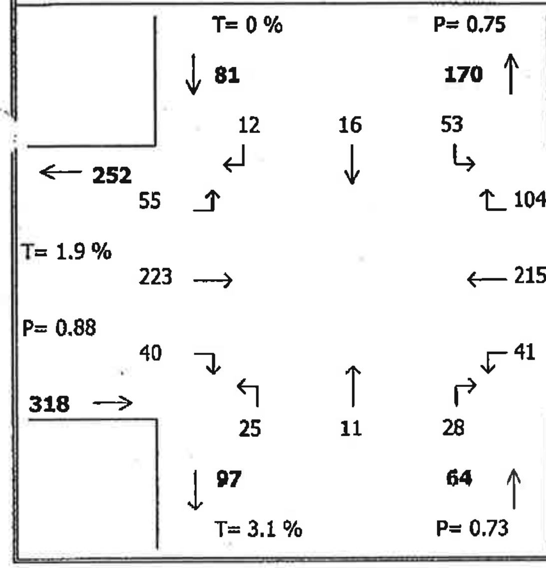
Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			
TIME PERIOD	↴	→	↗	↲	↓	↳	↰	↑	↱	↙	←	↖	ALL
16:00-16:05	0	13	0	0	0	1	0	0	0	0	22	0	36
16:05-16:10	0	10	0	1	1	1	0	0	0	0	21	1	35
16:10-16:15	0	15	2	0	0	3	0	0	0	0	24	1	45
16:15-16:20	0	14	1	1	0	3	0	0	0	1	23	0	43
16:20-16:25	0	17	0	0	1	3	0	0	0	0	18	2	41
16:25-16:30	2	17	0	0	0	6	0	0	0	0	21	2	48
16:30-16:35	1	23	0	3	0	3	1	0	0	0	22	1	54
16:35-16:40	1	10	0	0	0	2	1	0	0	1	25	3	43
16:40-16:45	1	18	0	0	1	1	1	0	0	0	14	3	39
16:45-16:50	1	11	0	1	0	5	0	0	0	0	29	3	50
16:50-16:55	0	17	0	1	0	1	0	0	0	0	35	3	57
16:55-17:00	1	25	1	2	0	8	0	0	0	0	37	1	75
17:00-17:05	1	17	1	2	0	10	0	0	0	0	39	9	79
17:05-17:10	0	32	3	0	0	6	0	0	0	0	28	3	72
17:10-17:15	1	16	1	1	0	5	0	0	0	0	49	0	73
17:15-17:20	0	15	1	2	0	2	0	0	0	0	40	5	65
17:20-17:25	0	25	2	0	0	3	3	0	0	0	39	5	77
17:25-17:30	0	12	1	1	0	2	0	0	0	0	43	2	61
17:30-17:35	2	17	1	0	1	5	0	0	0	0	30	3	59
17:35-17:40	2	18	0	0	0	4	1	0	0	0	29	4	58
17:40-17:45	0	22	0	0	0	3	1	0	0	0	26	1	53
17:45-17:50	1	12	2	2	0	4	0	2	0	1	25	3	52
17:50-17:55	1	17	0	2	0	2	0	0	0	0	24	2	48
17:55-18:00	0	15	3	0	0	3	2	1	0	2	38	1	65

TOTALS	15	408	19	19	4	86	10	3	0	5	701	58	1328
PHF	0.5	0.77	0.65	0.55	0.25	0.55	0.42	0.25	0	0.25	0.82	0.75	0.86
% Trucks	0	0.7	0	5.3	0	1.2	0	0	0	0	0.6	1.7	0.8
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		14			2			0			0		

INTERSECTION TURN MOVEMENT PEAK HOUR REPORT

File: Jinf



Peak Hour
16:45-17:45

Total Entry Volume
823

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

SUNSET BOULEVARD AT PINEHURST DRIVE
SHERWOOD, OR

Date: **04/17/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	→	↱	SOUTHBOUND ↲	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ↲	←	↰	ALL
ALL VEHICLES													
16:45-17:00	10	70	10	0	2	17	6	2	5	9	47	31	209
17:00-17:15	12	54	11	6	4	17	4	1	2	12	68	26	217
17:15-17:30	10	45	18	2	7	8	7	5	10	14	46	27	199
17:30-17:45	8	54	16	4	3	11	8	3	11	6	54	20	198
LIGHT TRUCKS (SINGLE UNIT 2 AXLES)													
16:45-17:00	0	1	0	0	0	0	0	0	0	0	0	0	1
17:00-17:15	0	1	1	0	0	0	0	1	0	0	2	1	6
17:15-17:30	1	1	0	0	0	0	1	0	0	0	1	0	4
17:30-17:45	0	0	0	0	0	0	0	0	0	1	1	0	2
MEDIUM TRUCKS (SINGLE UNIT > 2 AXLES)													
16:45-17:00	0	1	0	0	0	0	0	0	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	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	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	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	0	0	0
17:30-17:45	0	0	0	0	0	0	0	0	0	0	0	0	0

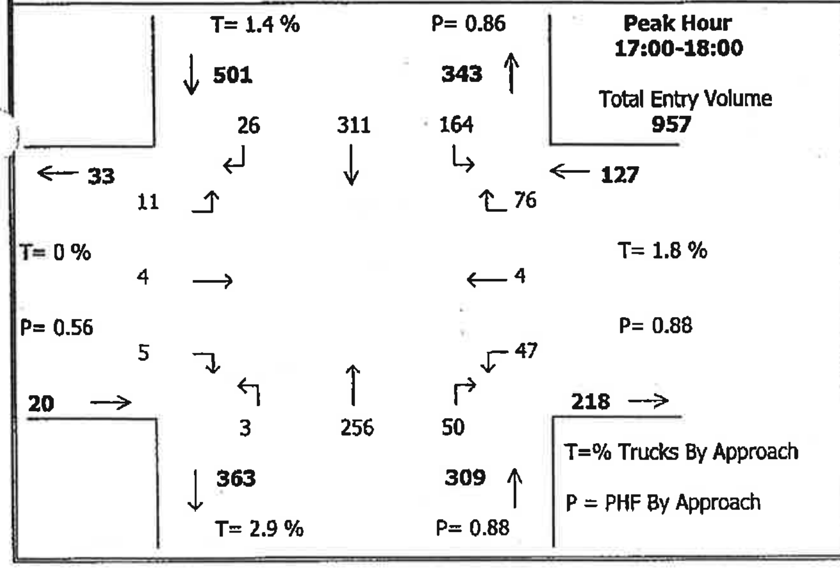
PEDESTRIANS

Crosswalk	SOUTH	WEST	EAST	NORTH	ALL
16:45-17:00	2	2	4	7	15
17:00-17:15	3	0	7	2	12
17:15-17:30	4	1	0	1	6
17:30-17:45	3	1	4	0	8

Peak Hour By Movement													
PHF	0.83	0.8	0.76	0.5	0.57	0.78	0.78	0.55	0.64	0.73	0.79	0.84	0.95
% Trucks (All)	2.5	1.8	1.8	0	0	0	4	9.1	0	2.4	1.9	1	1.7
% Trucks (M+H)	0	0.4	0	0	0	0	0	0	0	0	0	0	0.1
Stopped Busses	0	0	0	0	0	0	0	0	0	0	0	0	0

Hourly Totals													
16:00-17:00	40	201	30	8	12	51	27	10	20	29	160	76	664
16:15-17:15	39	203	36	10	15	59	24	8	16	35	200	90	735
16:30-17:30	39	206	46	10	17	62	25	10	23	42	208	102	790
16:45-17:45	40	223	55	12	16	53	25	11	28	41	215	104	823
17:00-18:00	39	212	55	16	17	51	25	12	32	45	225	91	820

INTERSECTION TURN MOVEMENT SUMMARY REPORT	File: Maxx



LOCATION:

SUNSET BOULEVARD AT WOODHAVEN DRIVE
SHERWOOD, OR

Date: **04/17/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

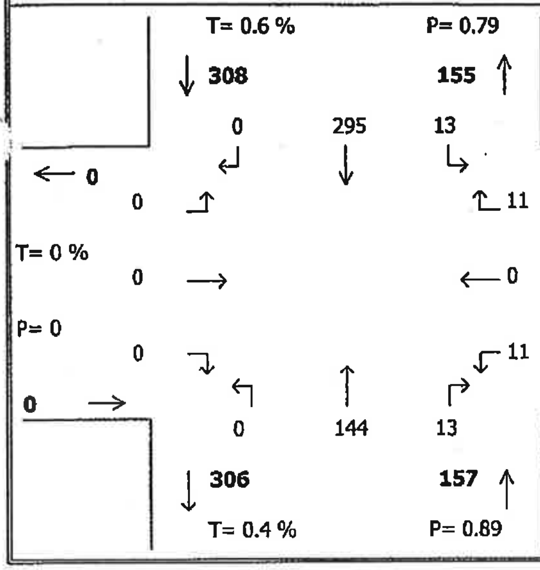
Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			
TIME PERIOD	↴	→	↗	↵	↓	↳	↰	↑	↱	↙	←	↖	ALL
16:00-16:05	0	0	0	1	10	10	1	11	0	2	0	6	41
16:05-16:10	2	0	1	1	20	6	1	16	2	0	1	5	55
16:10-16:15	0	0	0	0	17	15	0	25	5	1	1	7	71
16:15-16:20	1	1	2	0	17	11	0	14	2	1	0	5	54
16:20-16:25	0	0	3	1	30	13	0	9	2	0	0	9	67
16:25-16:30	0	1	0	1	20	8	2	9	2	2	0	3	48
16:30-16:35	0	2	0	1	10	8	0	19	7	2	1	9	59
16:35-16:40	1	2	1	3	16	7	0	16	3	4	1	4	58
16:40-16:45	0	2	0	1	21	18	0	10	1	0	0	6	59
16:45-16:50	0	0	2	3	20	13	0	15	1	0	0	3	57
16:50-16:55	0	0	0	4	19	9	3	12	4	2	0	4	57
16:55-17:00	0	0	0	3	20	13	0	22	1	1	0	10	70
17:00-17:05	1	0	2	3	16	8	1	16	1	7	0	5	60
17:05-17:10	0	0	0	1	32	14	0	21	4	2	1	10	85
17:10-17:15	1	0	1	2	41	13	0	22	2	3	0	4	89
17:15-17:20	1	1	0	4	27	12	1	27	5	4	1	8	91
17:20-17:25	0	0	1	0	29	14	0	28	3	4	1	9	89
17:25-17:30	0	1	0	2	32	7	0	18	3	1	0	8	72
17:30-17:35	0	0	0	3	17	17	1	22	7	3	0	8	78
17:35-17:40	0	0	2	0	23	26	0	18	8	2	0	4	83
17:40-17:45	0	0	0	5	30	11	0	15	2	3	0	7	73
17:45-17:50	2	1	2	2	17	14	0	28	5	3	0	3	77
17:50-17:55	0	0	2	0	16	14	0	17	3	7	1	2	62
17:55-18:00	0	1	1	4	31	14	0	24	7	8	0	8	98

TOTALS	9	12	20	45	531	295	10	434	80	62	8	147	1653
PHF	0.63	0.5	0.55	0.81	0.78	0.76	0.75	0.83	0.69	0.65	0.5	0.76	0.89
% Trucks	0	0	0	0	1.5	1.4	0	3.2	1.3	1.6	0	2	1.9
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		9			5			5			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: DEAFLM



Peak Hour
16:50-17:50

Total Entry Volume
487

T=% Trucks By Approach

P = PHF By Approach

LOCATION:

ELWERT ROAD AT SWANSTROM DRIVE
SHERWOOD, OR

Date: **04/10/03** Day: **THU**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

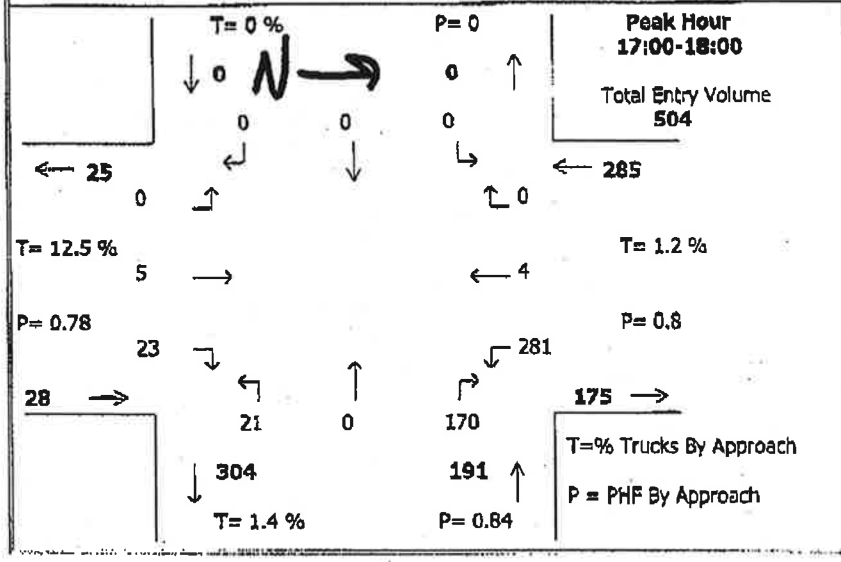
Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			
TIME PERIOD	↴	→	↱	↲	↓	↳	↰	↑	↱	↲	←	↰	ALL
16:00-16:05	0	0	0	0	15	1	0	9	2	0	1	1	29
16:05-16:10	0	0	0	0	11	0	0	11	0	0	0	0	22
16:10-16:15	0	0	0	0	8	0	0	6	0	1	0	0	15
16:15-16:20	0	0	0	0	18	0	0	9	0	1	0	0	28
16:20-16:25	0	0	0	0	20	1	0	9	0	0	0	1	31
16:25-16:30	0	0	0	0	18	1	0	9	1	2	0	0	31
16:30-16:35	0	0	0	0	15	0	0	5	0	0	0	1	21
16:35-16:40	0	0	0	0	35	2	0	2	0	0	0	1	40
16:40-16:45	0	0	0	0	15	1	0	12	0	0	0	0	28
16:45-16:50	0	0	0	0	14	0	0	12	1	2	0	0	29
16:50-16:55	0	0	0	0	27	0	0	9	1	1	0	0	38
16:55-17:00	0	0	0	0	17	2	0	9	2	2	0	2	34
17:00-17:05	0	0	0	0	23	0	0	11	2	0	0	1	37
17:05-17:10	0	0	0	0	17	0	0	11	3	2	0	2	35
17:10-17:15	0	0	0	0	18	1	0	16	0	0	0	0	35
17:15-17:20	0	0	0	0	23	2	0	12	1	1	0	2	41
17:20-17:25	0	0	0	0	26	1	0	8	0	0	0	1	36
17:25-17:30	0	0	0	0	27	2	0	11	1	0	0	0	41
17:30-17:35	0	0	0	0	27	1	0	16	0	0	0	1	45
17:35-17:40	0	0	0	0	33	4	0	13	1	2	0	0	53
17:40-17:45	0	0	0	0	32	0	0	13	0	2	0	0	47
17:45-17:50	0	0	0	0	25	0	0	15	2	1	0	2	45
17:50-17:55	0	0	0	0	12	2	0	19	0	0	0	3	36
17:55-18:00	0	0	0	0	17	1	0	8	2	0	0	1	29

TOTALS	0	0	0	0	493	22	0	255	19	17	1	19	826
PHF	0	0	0	0	0.8	0.46	0	0.86	0.46	0.55	0	0.55	0.84
% Trucks	0	0	0	0	0.6	0	0	0.4	0	0	0	0	0.5
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			0			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT

File: Libblm



Peak Hour
17:00-18:00

Total Entry Volume
504

T=% Trucks By Approach

P = PHF By Approach

LOCATION:
SW ELWERT ROAD AT KRUGER ROAD
SHERWOOD, OR

Date: **05/06/03** Day: **TUE**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY,INC
1225 NW Murray Blvd, Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

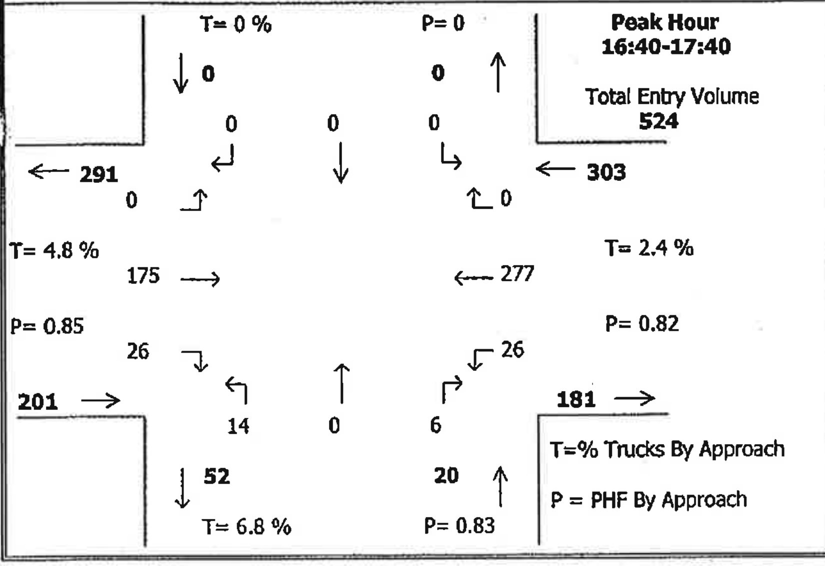
Report Reviewed by: JG

TIME PERIOD	EASTBOUND ↴	→	↱	SOUTHBOUND ↲	↓	↳	NORTHBOUND ↰	↑	↱	WESTBOUND ↲	←	↰	ALL
16:00-16:05	3	0	0	0	0	0	1	0	21	14	0	0	39
16:05-16:10	4	1	0	0	0	0	0	0	8	12	0	0	25
16:10-16:15	0	0	0	0	0	0	1	0	11	12	0	0	24
16:15-16:20	1	1	0	0	0	0	4	0	4	14	0	0	24
16:20-16:25	2	0	0	0	0	0	0	0	8	16	0	0	26
16:25-16:30	2	0	0	0	0	0	2	0	10	9	0	0	23
16:30-16:35	1	0	0	0	0	0	1	0	9	30	0	0	41
16:35-16:40	2	0	0	0	0	0	1	0	11	15	0	0	29
16:40-16:45	0	0	0	0	0	0	2	0	13	20	3	0	38
16:45-16:50	1	0	0	0	0	0	1	0	17	21	0	0	40
16:50-16:55	2	0	0	0	0	0	3	0	15	21	0	0	41
16:55-17:00	0	0	0	0	0	0	4	0	14	17	0	0	35
17:00-17:05	3	1	0	0	0	0	3	0	19	18	1	0	45
17:05-17:10	0	0	0	0	0	0	2	0	13	26	0	0	41
17:10-17:15	3	1	0	0	0	0	3	0	12	21	0	0	40
17:15-17:20	0	0	0	0	0	0	2	0	11	20	0	0	33
17:20-17:25	3	0	0	0	0	0	2	0	16	30	0	0	51
17:25-17:30	1	1	0	0	0	0	1	0	13	26	1	0	43
17:30-17:35	1	0	0	0	0	0	1	0	16	31	1	0	50
17:35-17:40	3	0	0	0	0	0	0	0	11	17	0	0	31
17:40-17:45	3	0	0	0	0	0	0	0	9	31	1	0	44
17:45-17:50	1	2	0	0	0	0	2	0	17	19	0	0	41
17:50-17:55	3	0	0	0	0	0	4	0	14	18	0	0	39
17:55-18:00	2	0	0	0	0	0	1	0	19	24	0	0	46

15

TOTALS	41	7	0	0	0	0	41	0	311	482	7	0	889
PHF	0.82	0.63	0	0	0	0	0.66	0	0.85	0.81	0.5	0	0.88
% Trucks	12.2	14.3	0	0	0	0	0	0	1.6	1.2	0	0	1.9
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		0			0			1			0		

INTERSECTION TURN MOVEMENT SUMMARY REPORT	File: MaxoLM.mod



LOCATION:

OREGON STREET AT LINCOLN STREET
SHERWOOD, OR

Date: **04/08/03** Day: **TUE**
From: **16:00-18:00**

Report Prepared for:
DKS ASSOCIATES

Surveyed By:
TRAFFIC SMITHY, INC
1225 NW Murray Blvd Suite 111
Portland, OR 97229
Phone: 503-641-6333 Fax: 503-643-8866

Report Reviewed by: JG

	EASTBOUND			SOUTHBOUND			NORTHBOUND			WESTBOUND			
TIME PERIOD	↴	→	⬏	↲	↓	↳	↰	↑	↱	↓	←	↑	ALL
16:00-16:05	1	20	0	0	0	0	1	0	1	2	16	0	41
16:05-16:10	2	12	0	0	0	0	1	0	1	5	13	0	34
16:10-16:15	2	8	0	0	0	0	0	0	0	1	15	0	26
16:15-16:20	2	11	0	0	0	0	1	0	0	4	17	0	35
16:20-16:25	2	11	0	0	0	0	1	0	1	2	16	0	33
16:25-16:30	2	14	0	0	0	0	1	0	0	2	23	0	42
16:30-16:35	1	5	0	0	0	0	2	0	1	4	23	0	36
16:35-16:40	1	13	0	0	0	0	1	0	0	1	23	0	39
16:40-16:45	3	8	0	0	0	0	2	0	1	0	26	0	40
16:45-16:50	2	22	0	0	0	0	2	0	0	2	27	0	55
16:50-16:55	1	14	0	0	0	0	1	0	0	0	22	0	38
16:55-17:00	1	18	0	0	0	0	2	0	1	5	22	0	49
17:00-17:05	2	23	0	0	0	0	0	0	1	4	9	0	39
17:05-17:10	2	11	0	0	0	0	2	0	0	4	25	0	44
17:10-17:15	3	16	0	0	0	0	0	0	1	3	40	0	63
17:15-17:20	4	8	0	0	0	0	0	0	0	2	15	0	29
17:20-17:25	1	8	0	0	0	0	2	0	0	2	30	0	43
17:25-17:30	1	14	0	0	0	0	1	0	0	2	25	0	43
17:30-17:35	2	13	0	0	0	0	0	0	1	0	19	0	35
17:35-17:40	4	20	0	0	0	0	2	0	1	2	17	0	46
17:40-17:45	1	7	0	0	0	0	4	0	3	1	22	0	38
17:45-17:50	3	5	0	0	0	0	1	0	1	0	12	0	22
17:50-17:55	1	10	0	0	0	0	2	0	0	3	19	0	35
17:55-18:00	3	13	0	0	0	0	1	0	0	6	17	0	40

TOTALS	47	304	0	0	0	0	30	0	14	57	493	0	945
PHF	0.72	0.8	0	0	0	0	0.7	0	0.75	0.5	0.81	0	0.9
% Trucks	17	3	0	0	0	0	10	0	0	0	2.6	0	3.9
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians		12			1			1			0		

Level of Service Analysis

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Scenario Report

Scenario:	2020 PM Peak
Command:	2020 PM Peak
Volume:	Default Volume
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Paths
Routes:	Default Routes
Configuration:	Default Configuration

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

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 ORE 99W/Home Depot	C	25.9	0.895	C	25.9	0.895	+ 0.000 D/V
# 2 ORE 99W/Tualatin-Sherwood Rd	E	55.9	0.986	E	55.9	0.986	+ 0.000 D/V
# 3 ORE 99W/Sherwood Blvd	D	48.0	0.942	D	48.0	0.942	+ 0.000 D/V
# 4 ORE 99W/Meinecke	B	18.5	0.761	B	18.5	0.761	+ 0.000 D/V
# 5 ORE 99W/Sunset	D	36.8	0.919	D	36.8	0.919	+ 0.000 D/V
# 6 ORE 99W/Brookman	F	268.3	0.000	F	268.3	0.000	+ 0.000 D/V
# 7 Tualatin-Sherwood/Cipole	C	25.7	0.886	C	25.7	0.886	+ 0.000 D/V
# 8 Tualatin-Sherwood/Oregon	E	78.6	1.200	E	78.6	1.200	+ 0.000 D/V
# 9 Tualatin-Sherwood/Gerda	F	231.6	0.000	F	231.6	0.000	+ 0.000 D/V
# 10 Tualatin-Sherwood/Langer	C	33.4	0.897	C	33.4	0.897	+ 0.000 D/V
# 11 Tualatin-Sherwood/Regal Cinema	C	23.9	0.722	C	23.9	0.722	+ 0.000 D/V
# 12 Roy Rogers/Borchers	A	8.5	0.603	A	8.5	0.603	+ 0.000 D/V
# 13 Oregon/Tonquin	F	171.6	0.000	F	171.6	0.000	+ 0.000 D/V
# 14 Oregon/Murdock	A	7.9	0.000	A	7.9	0.000	+ 0.000 V/C
# 15 Murdock/Willamette	B	14.7	0.000	B	14.7	0.000	+ 0.000 D/V
# 16 Sunset/Murdock	B	11.2	0.474	B	11.2	0.474	+ 0.000 V/C
# 17 Sunset/Sherwood	D	33.3	0.970	D	33.3	0.970	+ 0.000 V/C
# 18 Edy/Elwert	B	13.0	0.649	B	13.0	0.649	+ 0.000 V/C
# 19 Edy/Borchers	C	24.3	0.000	C	24.3	0.000	+ 0.000 D/V
# 20 Sherwood/Langer	E	55.5	0.771	E	55.5	0.771	+ 0.000 D/V
# 21 Sherwood/Century	F	OVRFL	0.000	F	OVRFL	0.000	+ 0.000 D/V
# 22 Sherwood-Pine/3rd	D	31.0	0.000	D	31.0	0.000	+ 0.000 D/V
# 23 Pine/Oregon	F	63.2	0.000	F	63.2	0.000	+ 0.000 D/V

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 24 Washington/Railroad	B	12.4	0.609	B	12.4	0.609	+ 0.000 V/C
# 25 Washington/3rd	A	9.5	0.356	A	9.5	0.356	+ 0.000 V/C
# 26 Sherwood/Railroad	B	11.2	0.525	B	11.2	0.525	+ 0.000 V/C
# 27 Cipole/Herman	B	10.2	0.411	B	10.2	0.411	+ 0.000 V/C
# 28 Meinecke/Dewey	A	4.0	0.000	A	4.0	0.000	+ 0.000 V/C
# 29 Brookman/Ladd Hill	B	11.1	0.000	B	11.1	0.000	+ 0.000 D/V
# 30 Sunset/Pine	D	27.2	0.000	D	27.2	0.000	+ 0.000 D/V
# 31 Sunset/Pinehurst	C	15.8	0.728	C	15.8	0.728	+ 0.000 V/C
# 32 Sunset/Woodhaven	E	38.8	0.000	E	38.8	0.000	+ 0.000 D/V
# 33 Elwert/Swanstrom	B	11.1	0.000	B	11.1	0.000	+ 0.000 D/V
# 34 Elwert/Kruger	B	13.5	0.000	B	13.5	0.000	+ 0.000 D/V
# 35 Oregon/Lincoln	B	13.2	0.000	B	13.2	0.000	+ 0.000 D/V

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #1 ORE 99W/Home Depot

```
Cycle (sec):        120                  Critical Vol./Cap. (X):     0.895
Loss Time (sec):     12 (Y+R =  4 sec)   Average Delay (sec/veh):     25.9
Optimal Cycle:      117                  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        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  0  2  0  1   1  0  1  1  0   0  1  0  0  1   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      23   908   179    91  2077    12    60     1    31   251     0    57
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:   23   908   179    91  2077    12    60     1    31   251     0    57
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:     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 Volume:    23   908   179    91  2077    12    60     1    31   251     0    57
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   23   908   179    91  2077    12    60     1    31   251     0    57
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.:    23   908   179    91  2077    12    60     1    31   251     0    57
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  0.90  0.90  0.80  0.93  0.93  0.93  0.42  0.42  0.85  0.66  1.00  0.83
Lanes:       1.00  2.00  1.00  1.00  1.99  0.01  0.98  0.02  1.00  1.00  0.00  1.00
Final Sat.:  1702  3404  1523  1769  3514    20   777    13  1615  1248     0  1583
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01  0.27  0.12  0.05  0.59  0.59  0.08  0.08  0.02  0.20  0.00  0.04
Crit Moves:  ****                    ****                          ****
Green/Cycle: 0.02  0.57  0.57  0.11  0.66  0.66  0.22  0.22  0.22  0.22  0.00  0.22
Volume/Cap:  0.90  0.47  0.21  0.47  0.90  0.90  0.34  0.34  0.09  0.90  0.00  0.16
Delay/Veh:  190.5  15.6  12.9  52.0  21.9  21.9  40.2  40.2  36.9  73.6   0.0  37.6
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: 190.5  15.6  12.9  52.0  21.9  21.9  40.2  40.2  36.9  73.6   0.0  37.6
HCM2kAvg:       2    10     3     4    35    40     5     4     1    17     0     2
*************************************************************************
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------------------------------------------------------------------------------
                              Sherwood TSP
                        Future (2020) PM Peak
                          No-Build Scenario
------------------------------------------------------------------------------
                 Level Of Service Computation Report
       2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #2 ORE 99W/Tualatin-Sherwood Rd
******************************************************************************
Cycle (sec):         120           Critical Vol./Cap. (X):         0.986
Loss Time (sec):      16 (Y+R =  4 sec) Average Delay (sec/veh):    55.9
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       Split Phase      Split Phase
Rights:         Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       1  0  3  0  1   1  0  2  1  0   1  0  1  0  1   2  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     159   919   517   178  1760   295   137   302   117   549   319   139
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:  159   919   517   178  1760   295   137   302   117   549   319   139
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:     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 Volume:   159   919   517   178  1760   295   137   302   117   549   319   139
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:  159   919   517   178  1760   295   137   302   117   549   319   139
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.:   159   919   517   178  1760   295   137   302   117   549   319   139
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  0.90  0.86  0.80  0.93  0.87  0.87  0.87  0.92  0.78  0.89  0.96  0.82
Lanes:       1.00  3.00  1.00  1.00  2.57  0.43  1.00  1.00  1.00  2.00  1.00  1.00
Final Sat.:  1702  4891  1523  1769  4258   714  1655  1742  1481  3369  1828  1554
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09  0.19  0.34  0.10  0.41  0.41  0.08  0.17  0.08  0.16  0.17  0.09
Crit Moves:  ****                    ****                    ****              ****
Green/Cycle: 0.09  0.40  0.40  0.12  0.42  0.42  0.18  0.18  0.18  0.18  0.18  0.18
Volume/Cap:  0.99  0.47  0.86  0.36  0.99  0.99  0.47  0.99  0.45  0.92  0.99  0.51
Delay/Veh:  120.8  27.1  44.7  79.8  51.0  51.0  45.6  96.8  45.5  68.3  95.3  46.2
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: 120.8  27.1  44.7  79.8  51.0  51.0  45.6  96.8  45.5  68.3  95.3  46.2
HCM2kAvg:      10     8    20     9    31    31     5    16     4    14    17     5
******************************************************************************
```



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------------------------------------------------------------------------------
                              Sherwood TSP
                        Future (2020) PM Peak
                          No-Build Scenario
------------------------------------------------------------------------------
                 Level Of Service Computation Report
       2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #3 ORE 99W/Sherwood Blvd
******************************************************************************
Cycle (sec):         120           Critical Vol./Cap. (X):         0.942
Loss Time (sec):      16 (Y+R =  4 sec) Average Delay (sec/veh):    48.0
Optimal Cycle:       155           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       Split Phase      Split Phase
Rights:         Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       1  0  2  1  0   1  0  2  1  0   1  0  1  0  1   1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      83  1529   122   348  1808   173   159   280   152   294   205   179
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:   83  1529   122   348  1808   173   159   280   152   294   205   179
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:     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 Volume:    83  1529   122   348  1808   173   159   280   152   294   205   179
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   83  1529   122   348  1808   173   159   280   152   294   205   179
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.:    83  1529   122   348  1808   173   159   280   152   294   205   179
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  0.91  0.87  0.87  0.93  0.88  0.88  0.94  0.99  0.84  0.96  0.96  0.84
Lanes:       1.00  2.78  0.22  1.00  2.74  0.26  1.00  1.00  1.00  1.18  0.82  1.00
Final Sat.:  1736  4570   365  1769  4579   438  1787  1881  1599  2152  1501  1599
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05  0.33  0.33  0.20  0.39  0.39  0.09  0.15  0.10  0.14  0.14  0.11
Crit Moves:        ****        ****                    ****              ****
Green/Cycle: 0.06  0.35  0.35  0.21  0.50  0.50  0.16  0.16  0.16  0.14  0.14  0.14
Volume/Cap:  0.79  0.94  0.94  0.94  0.79  0.79  0.56  0.94  0.60  0.94  0.94  0.77
Delay/Veh:   86.6  48.3  48.3  79.0  26.2  26.2  49.3  87.0  51.0  76.3  76.3  64.2
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:  86.6  48.3  48.3  79.0  26.2  26.2  49.3  87.0  51.0  76.3  76.3  64.2
HCM2kAvg:       5    24    24    18    21    21     6    14     6    13    13     8
******************************************************************************
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Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #4 ORE 99W/Meinecke

Cycle (sec): 120 Critical Vol./Cap. (X): 0.761
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 18.5
Optimal Cycle: 72 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 2 0 1			1 0 2 0 1			1 0 1 0 1			1 0 1 0 1		
Volume Module:												
Base Vol:	13	1503	103	275	2130	55	19	15	17	87	14	118
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:	13	1503	103	275	2130	55	19	15	17	87	14	118
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:	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 Volume:	13	1503	103	275	2130	55	19	15	17	87	14	118
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	13	1503	103	275	2130	55	19	15	17	87	14	118
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	1503	103	275	2130	55	19	15	17	87	14	118
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.81	0.93	0.93	0.83	0.76	1.00	0.85	0.73	0.97	0.83
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1718	3437	1537	1769	3538	1583	1438	1900	1615	1395	1845	1568
Capacity Analysis Module:												
Vol/Sat:	0.01	0.44	0.07	0.16	0.60	0.03	0.01	0.01	0.01	0.06	0.01	0.08
Crit Moves:	****				****							****
Green/Cycle:	0.01	0.59	0.59	0.21	0.79	0.79	0.10	0.10	0.10	0.10	0.10	0.10
Volume/Cap:	0.76	0.74	0.11	0.74	0.76	0.04	0.13	0.08	0.11	0.63	0.08	0.76
Delay/Veh:	165.0	19.3	10.8	52.0	7.8	2.7	49.8	49.3	49.5	61.0	49.3	72.2
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:	165.0	19.3	10.8	52.0	7.8	2.7	49.8	49.3	49.5	61.0	49.3	72.2
HCM2kAvg:	2	21	2	11	22	0	1	1	1	5	1	6

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5 ORE 99W/Sunset

Cycle (sec): 120 Critical Vol./Cap. (X): 0.919
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 36.8
Optimal Cycle: 132 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			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2 0 1			2 0 2 0 1			0 1 0 0 1			0 1 0 0 1		
Volume Module:												
Base Vol:	109	1353	149	379	1862	27	16	167	247	148	104	221
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	1353	149	379	1862	27	16	167	247	148	104	221
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:	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 Volume:	109	1353	149	379	1862	27	16	167	247	148	104	221
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	109	1353	149	379	1862	27	16	167	247	148	104	221
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.:	109	1353	149	379	1862	27	16	167	247	148	104	221
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.81	0.90	0.93	0.83	0.94	0.94	0.83	0.56	0.56	0.83
Lanes:	1.00	2.00	1.00	2.00	2.00	1.00	0.09	0.91	1.00	0.59	0.41	1.00
Final Sat.:	1718	3437	1537	3432	3538	1583	157	1635	1583	623	438	1568
Capacity Analysis Module:												
Vol/Sat:	0.06	0.39	0.10	0.11	0.53	0.02	0.10	0.10	0.16	0.24	0.24	0.14
Crit Moves:	****				****						****	
Green/Cycle:	0.07	0.50	0.50	0.14	0.57	0.57	0.26	0.26	0.26	0.26	0.26	0.26
Volume/Cap:	0.92	0.79	0.19	0.79	0.92	0.03	0.40	0.40	0.60	0.92	0.92	0.55
Delay/Veh:	113.5	27.1	16.7	58.1	30.5	11.2	37.3	37.3	41.7	77.0	77.0	40.0
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:	113.5	27.1	16.7	58.1	30.5	11.2	37.3	37.3	41.7	77.0	77.0	40.0
HCM2kAvg:	7	22	3	9	35	0	6	6	9	20	20	8

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #6 ORE 99W/Brookman

Average Delay (sec/veh): 9.3 Worst Case Level Of Service: F[268.3]

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	1 0	1 0	1	1 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	22	1506	55	27	2100	28	26	1	41	84	5	7
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:	22	1506	55	27	2100	28	26	1	41	84	5	7
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:	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 Volume:	22	1506	55	27	2100	28	26	1	41	84	5	7
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	22	1506	55	27	2100	28	26	1	41	84	5	7
Critical Gap Module:												
Critical Gp:	4.2	xxxx	xxxxx	4.1	xxxx	xxxxx	7.5	6.5	6.9	7.6	6.6	7.0
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	2128	xxxx	xxxxx	1561	xxxx	xxxxx	2968	3773	1064	2682	3760	781
Potent Cap.:	245	xxxx	xxxxx	419	xxxx	xxxxx	6	4	219	10	4	334
Move Cap.:	245	xxxx	xxxxx	419	xxxx	xxxxx	0	3	219	6	3	334
Total Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	42	61	xxxxx	77	47	xxxxx
Volume/Cap:	0.09	xxxx	xxxx	0.06	xxxx	xxxx	0.62	0.02	0.19	1.10	0.11	0.02
Leval Of Service Module:												
Queue:	0.3	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	21.1	xxxx	xxxxx	14.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	C	*	*	B	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	82	xxxxx	xxxx	73	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	4.2	xxxxx	xxxxx	7.2	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	144	xxxxx	xxxxx	268	xxxxx
Shared LOS:	*	*	*	*	*	*	*	F	*	*	F	*
ApproachDel:		xxxxxx			xxxxxx			143.8			268.3	
ApproachLOS:		*			*			F			F	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #7 Tualatin-Sherwood/Cipole

Cycle (sec): 120 Critical Vol./Cap. (X): 0.886
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 25.7
Optimal Cycle: 113 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:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	1 0	0	0 1	1 0	1	0 0	0 0	1	0 1
Volume Module:												
Base Vol:	0	0	0	71	0	179	89	1190	0	0	1139	60
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	71	0	179	89	1190	0	0	1139	60
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:	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 Volume:	0	0	0	71	0	179	89	1190	0	0	1139	60
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	71	0	179	89	1190	0	0	1139	60
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.:	0	0	0	71	0	179	89	1190	0	0	1139	60
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.90	1.00	0.81	0.91	0.96	1.00	1.00	0.95	0.81
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Final Sat.:	0	0	0	1718	0	1537	1736	1828	0	0	1809	1537
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.04	0.00	0.12	0.05	0.65	0.00	0.00	0.63	0.04
Crit Moves:						****	****				****	
Green/Cycle:	0.00	0.00	0.00	0.13	0.00	0.13	0.06	0.77	0.00	0.00	0.71	0.71
Volume/Cap:	0.00	0.00	0.00	0.31	0.00	0.89	0.89	0.85	0.00	0.00	0.89	0.05
Delay/Veh:	0.0	0.0	0.0	48.0	0.0	85.3	111.1	14.2	0.0	0.0	21.3	5.2
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:	0.0	0.0	0.0	48.0	0.0	85.3	111.1	14.2	0.0	0.0	21.3	5.2
HCM2kAvg:	0	0	0	3	0	9	6	31	0	0	36	1

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #8 Tualatin-Sherwood/Oregon

Cycle (sec):	120	Critical Vol./Cap. (X):	1.200
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	78.6
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:	Permitted			Permitted			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 0 1 0			0 0 1! 0 0			1 0 1 0 1			1 0 0 1 0		
Volume Module:												
Base Vol:	125	6	198	10	11	1	3	1198	124	496	1163	5
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:	125	6	198	10	11	1	3	1198	124	496	1163	5
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:	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 Volume:	125	6	198	10	11	1	3	1198	124	496	1163	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	125	6	198	10	11	1	3	1198	124	496	1163	5
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.:	125	6	198	10	11	1	3	1198	124	496	1163	5
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.72	0.82	0.82	0.51	0.51	0.51	0.90	0.94	0.80	0.93	0.98	0.98
Lanes:	1.00	0.03	0.97	0.45	0.50	0.05	1.00	1.00	1.00	1.00	0.99	0.01
Final Sat.:	1371	46	1515	442	486	44	1702	1792	1523	1769	1852	8
Capacity Analysis Module:												
Vol/Sat:	0.09	0.13	0.13	0.02	0.02	0.02	0.00	0.67	0.08	0.28	0.63	0.63
Crit Moves:		****						****		****		
Green/Cycle:	0.11	0.11	0.34	0.11	0.11	0.11	0.00	0.56	0.56	0.23	0.79	0.79
Volume/Cap:	0.84	1.20	0.38	0.21	0.21	0.21	0.80	1.20	0.15	1.20	0.80	0.80
Delay/Veh:	84.3	186	30.3	49.7	49.7	49.7	356.7	126	12.9	157.0	10.3	10.3
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:	84.3	186	30.3	49.7	49.7	49.7	356.7	126	12.9	157.0	10.3	10.3
HCM2kAvg:	8	14	6	2	1	1	1	70	2	33	26	13

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #9 Tualatin-Sherwood/Gerda

Average Delay (sec/veh): 14.5   Worst Case Level Of Service: F[231.6]

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 1			1 0 1 0 0			0 0 0 1 0		
Volume Module:												
Base Vol:	0	0	0	70	0	75	35	1036	0	0	1077	53
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	70	0	75	35	1036	0	0	1077	53
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:	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 Volume:	0	0	0	70	0	75	35	1036	0	0	1077	53
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	70	0	75	35	1036	0	0	1077	53
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	2209	xxxx	1104	1130	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	49	xxxx	257	604	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	46	xxxx	257	604	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	1.51	xxxx	0.29	0.06	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	6.8	xxxx	1.2	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	453.3	xxxx	24.7	11.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	F	*	C	B	*	*	*	*	*
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
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			231.6			xxxxxx			xxxxxx		
ApproachLOS:	*			F			*			*		

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #10 Tualatin-Sherwood/Langer

Cycle (sec):	120	Critical Vol./Cap. (X):	0.897
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	33.4
Optimal Cycle:	118	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:	1 0 0 1 0			1 0 0 1 0			1 0 1 0 1			1 0 0 1 0		
Volume Module:												
Base Vol:	9	3	210	7	7	11	7	909	17	267	967	10
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:	9	3	210	7	7	11	7	909	17	267	967	10
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:	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 Volume:	9	3	210	7	7	11	7	909	17	257	967	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	9	3	210	7	7	11	7	909	17	257	967	10
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.:	9	3	210	7	7	11	7	909	17	267	967	10
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.72	0.81	0.81	0.28	0.85	0.85	0.88	0.93	0.79	0.92	0.97	0.97
Lanes:	1.00	0.01	0.99	1.00	0.39	0.61	1.00	1.00	1.00	1.00	0.99	0.01
Final Sat.:	1364	22	1519	526	627	986	1671	1759	1495	1753	1824	19
Capacity Analysis Module:												
Vol/Sat:	0.01	0.14	0.14	0.01	0.01	0.01	0.00	0.52	0.01	0.15	0.53	0.53
Crit Moves:		****						****		****		
Green/Cycle:	0.15	0.15	0.15	0.15	0.15	0.15	0.01	0.58	0.58	0.17	0.74	0.74
Volume/Cap:	0.04	0.90	0.90	0.09	0.07	0.07	0.72	0.90	0.02	0.90	0.72	0.72
Delay/Veh:	43.3	82.2	82.2	44.0	43.5	43.5	189.3	32.8	10.9	76.3	10.5	10.5
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:	43.3	82.2	82.2	44.0	43.5	43.5	189.3	32.8	10.9	76.3	10.5	10.5
HCM2kAvg:	0	14	11	1	1	1	1	33	0	13	20	21

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #11 Tualatin-Sherwood/Regal Cinema

Cycle (sec):	120	Critical Vol./Cap. (X):	0.722
Loss Time (sec):	16 (Y+R = 4 sec)	Average Delay (sec/veh):	23.9
Optimal Cycle:	76	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:		Split Phase			Split Phase			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 1 0 1			2 0 1 0 1			1 0 1 0 1		
Volume Module:												
Base Vol:	155	15	75	11	33	30	29	810	208	102	876	28
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:	155	15	75	11	33	30	29	810	208	102	876	28
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:	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 Volume:	155	15	75	11	33	30	29	810	208	102	876	28
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	155	15	75	11	33	30	29	810	208	102	876	28
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.:	155	15	75	11	33	30	29	810	208	102	876	28
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.93	0.86	0.85	0.94	0.99	0.84	0.85	0.93	0.79	0.91	0.96	0.82
Lanes:	1.00	0.17	0.83	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1769	272	1353	1787	1881	1599	3243	1759	1495	1736	1828	1554
Capacity Analysis Module:												
Vol/Sat:	0.09	0.06	0.06	0.01	0.02	0.02	0.01	0.46	0.14	0.06	0.48	0.02
Crit Moves:	****					****		****		****		
Green/Cycle:	0.12	0.12	0.12	0.03	0.03	0.03	0.01	0.64	0.64	0.08	0.71	0.71
Volume/Cap:	0.72	0.46	0.46	0.24	0.67	0.72	0.68	0.72	0.22	0.72	0.68	0.03
Delay/Veh:	62.1	50.7	50.7	59.9	89.4	104.7	95.0	16.9	9.3	70.4	11.4	5.3
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:	62.1	50.7	50.7	59.9	89.4	104.7	95.0	16.9	9.3	70.4	11.4	5.3
HCM2kAvg:	7	4	4	1	2	2	2	21	3	5	19	0

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Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #12 Roy Rogers/Borchers

Cycle (sec):	60	Critical Vol./Cap. (X):	0.603
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	8.5
Optimal Cycle:	44	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:	Split Phase			Split Phase			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 0	0	1 0	1 0	1	0 0
Volume Module:												
Base Vol:	113	0	21	0	0	0	0	515	183	21	586	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:	113	0	21	0	0	0	0	515	183	21	586	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:	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 Volume:	113	0	21	0	0	0	0	515	183	21	586	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	113	0	21	0	0	0	0	515	183	21	586	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	1.00	1.00	1.00	1.00	1.00
Final Vol.:	113	0	21	0	0	0	0	515	183	21	586	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	1.00	0.82	1.00	1.00	1.00	1.00	0.91	0.91	0.90	0.95	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	1.00	0.74	0.26	1.00	1.00	0.00
Final Sat.:	1736	0	1554	0	0	0	1900	1270	451	1718	1809	0
Capacity Analysis Module:												
Vol/Sat:	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.41	0.41	0.01	0.32	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.67	0.67	0.02	0.69	0.00
Volume/Cap:	0.60	0.00	0.13	0.00	0.00	0.00	0.00	0.60	0.60	0.60	0.47	0.00
Delay/Veh:	31.0	0.0	24.5	0.0	0.0	0.0	0.0	6.3	6.3	55.6	4.5	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	24.5	0.0	0.0	0.0	0.0	6.3	6.3	55.6	4.5	0.0
HCM2kAvg:	3	0	0	0	0	0	0	8	8	1	5	0

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #13 Oregon/Tonquin

Average Delay (sec/veh): 49.0 Worst Case Level Of Service: F[171.6]

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	1 0	0	0 1
Volume Module:												
Base Vol:	0	190	182	125	577	0	0	0	0	322	0	98
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	190	182	125	577	0	0	0	0	322	0	98
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:	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 Volume:	0	190	182	125	577	0	0	0	0	322	0	98
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	190	182	125	577	0	0	0	0	322	0	98
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	372	xxxx	xxxxx	xxxx	xxxx	xxxxx	1017	xxxx	190
Potent Cap.:	xxxx	xxxx	xxxxx	1181	xxxx	xxxxx	xxxx	xxxx	xxxxx	262	xxxx	849
Move Cap.:	xxxx	xxxx	xxxxx	1181	xxxx	xxxxx	xxxx	xxxx	xxxxx	239	xxxx	849
Volume/Cap:	xxxx	xxxx	xxxx	0.11	xxxx	xxxx	xxxx	xxxx	xxxx	1.35	xxxx	0.12
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	0.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	17.3	xxxx	0.4
Stopped Del:	xxxxx	xxxx	xxxxx	8.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	220.9	xxxx	9.8
LOS by Move:	*	*	*	A	*	*	*	*	*	F	*	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
SharedQueue:	xxxxx	xxxx	xxxxx	0.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	8.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			171.6		
ApproachLOS:	*			*			*			F		

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
FHWA Roundabout Method (Base Volume Alternative)

Intersection #14 Oregon/Murdock

Average Delay (sec/veh): 7.9 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:	Yield Sign			Yield Sign			Yield Sign			Yield Sign		
Lanes:	1			0			1			1		
Volume Module:												
Base Vol:	17	0	159	0	0	0	0	176	36	501	318	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:	17	0	159	0	0	0	0	176	36	501	318	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:	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 Volume:	17	0	159	0	0	0	0	176	36	501	318	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	17	0	159	0	0	0	0	176	36	501	318	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	1.00	1.00	1.00	1.00	1.00
Final Vol.:	17	0	159	0	0	0	0	176	36	501	318	0
PCE Module:												
AutoPCE:	16	0	154	0	0	0	0	169	35	496	315	0
TruckPCE:	1	0	7	0	0	0	0	8	2	8	5	0
ComboPCE:	0	0	0	0	0	0	0	0	0	0	0	0
BicyclePCE:	0	0	0	0	0	0	0	0	0	0	0	0
AdjVolume:	17	0	161	0	0	0	0	180	37	504	320	0

Delay Module: >> Time Period: 0.25 hours <<

	North Bound	South Bound	East Bound	West Bound
CircVolume:	180	840	504	17
MaxVolume:	1103	xxxxxx	928	1191
PedVolume:	0	0	0	0
AdjMaxVol:	1103	xxxxxx	928	1191
ApproachVol:	179	xxxxxx	217	823
ApproachDel:	3.9	xxxxxx	5.1	9.5
Queue:	0.6	xxxx	0.9	5.9

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #15 Murdock/Willamette

Average Delay (sec/veh): 1.1 Worst Case Level Of Service: B[14.7]

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:	8	172	6	22	402	29	14	4	4	5	2	8
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:	8	172	6	22	402	29	14	4	4	5	2	8
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:	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 Volume:	8	172	6	22	402	29	14	4	4	5	2	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	8	172	6	22	402	29	14	4	4	5	2	8
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.2	6.6	6.3	7.3	6.7	6.4
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.6	4.1	3.4	3.7	4.2	3.5
Capacity Module:												
Cnflict Vol:	431	xxxx	xxxxx	178	xxxx	xxxxx	657	655	417	656	666	175
Potent Cap.:	1129	xxxx	xxxxx	1404	xxxx	xxxxx	372	380	626	359	362	831
Move Cap.:	1129	xxxx	xxxxx	1404	xxxx	xxxxx	360	371	626	348	353	831
Volume/Cap:	0.01	xxxx	xxxx	0.02	xxxx	xxxx	0.04	0.01	0.01	0.01	0.01	0.01
Level Of Service Module:												
Queue:	0.0	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	8.2	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
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	392	xxxxx	xxxx	506	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.2	xxxxx	xxxxx	0.1	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	14.7	xxxxx	xxxxx	12.3	xxxxx
Shared LOS:	*	*	*	*	*	*	*	B	*	*	B	*
ApproachDel:	xxxxxx			xxxxxx			14.7			12.3		
ApproachLOS:	*			*			B			B		

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                              Sherwood TSP
                          Future (2020) PM Peak
                           No-Build Scenario
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #16 Sunset/Murdock
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.474
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       11.2
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
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    1  0  0  1  0    0  0  1! 0  0
------------|-----------------||-----------------||-----------------||-----------------|
Volume Module:
Base Vol:     214    65     4    22    46   288    98    17   159     1    10    13
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:  214    65     4    22    46   288    98    17   159     1    10    13
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:     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 Volume:   214    65     4    22    46   288    98    17   159     1    10    13
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:  214    65     4    22    46   288    98    17   159     1    10    13
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.:   214    65     4    22    46   288    98    17   159     1    10    13
------------|-----------------||-----------------||-----------------||-----------------|
Saturation Flow Module:
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:       0.76  0.23  0.01  0.06  0.13  0.81  1.00  0.10  0.90  0.04  0.42  0.54
Final Sat.:   497   151     9    46    97   608   523    60   565    23   231   300
------------|-----------------||-----------------||-----------------||-----------------|
Capacity Analysis Module:
Vol/Sat:     0.43  0.43  0.43  0.47  0.47  0.47  0.19  0.28  0.28  0.04  0.04  0.04
Crit Moves:        ****              ****              ****              ****
Delay/Veh:   12.0  12.0  12.0  11.4  11.4  11.4  10.6  10.0  10.0   8.9   8.9   8.9
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:  12.0  12.0  12.0  11.4  11.4  11.4  10.6  10.0  10.0   8.9   8.9   8.9
LOS by Move:    B     B     B     B     B     B     B     B     B     A     A     A
ApproachDel:       12.0              11.4              10.2               8.9
Delay Adj:         1.00              1.00              1.00              1.00
ApprAdjDel:        12.0              11.4              10.2               8.9
LOS by Appr:          B                 B                 B                 A
********************************************************************************
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                              Sherwood TSP
                          Future (2020) PM Peak
                           No-Build Scenario
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #17 Sunset/Sherwood
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.970
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       33.3
Optimal Cycle:        0               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:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
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:      42   109    39    63   205   159    76   244    40    67   404    74
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:   42   109    39    63   205   159    76   244    40    67   404    74
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:     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 Volume:    42   109    39    63   205   159    76   244    40    67   404    74
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   42   109    39    63   205   159    76   244    40    67   404    74
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   109    39    63   205   159    76   244    40    67   404    74
------------|-----------------||-----------------||-----------------||-----------------|
Saturation Flow Module:
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:       1.00  0.74  0.26  1.00  0.56  0.44  1.00  0.86  0.14  1.00  0.85  0.15
Final Sat.:   389   310   111   427   267   207   423   393    64   447   416    76
------------|-----------------||-----------------||-----------------||-----------------|
Capacity Analysis Module:
Vol/Sat:     0.11  0.35  0.35  0.15  0.77  0.77  0.18  0.62  0.62  0.15  0.97  0.97
Crit Moves:              ****        ****              ****                    ****
Delay/Veh:   12.6  15.0  15.0  12.4  29.7  29.7  12.7  21.5  21.5  12.0  59.6  59.6
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:  12.6  15.0  15.0  12.4  29.7  29.7  12.7  21.5  21.5  12.0  59.6  59.6
LOS by Move:    B     B     B     B     D     D     B     C     C     B     F     F
ApproachDel:       14.4              27.1              19.7              53.8
Delay Adj:         1.00              1.00              1.00              1.00
ApprAdjDel:        14.4              27.1              19.7              53.8
LOS by Appr:          B                 D                 C                 F
********************************************************************************
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Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #18 Edy/Elwert

Cycle (sec):	100	Critical Vol./Cap. (X):	0.649
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	13.0
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	
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 0 1! 0 0			0 0 1! 0 0	
Volume Module:												
Base Vol:	10	129	26	76	396	17	7	56	11	28	59	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:	10	129	26	76	396	17	7	56	11	28	59	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:	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 Volume:	10	129	26	76	396	17	7	56	11	28	59	43
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	129	26	76	396	17	7	56	11	28	59	43
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.:	10	129	26	76	396	17	7	56	11	28	59	43
Saturation Flow Module:												
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:	0.06	0.78	0.16	0.16	0.81	0.03	0.09	0.76	0.15	0.22	0.45	0.33
Final Sat.:	42	537	108	117	610	26	54	432	85	130	275	200
Capacity Analysis Module:												
Vol/Sat:	0.24	0.24	0.24	0.65	0.65	0.65	0.13	0.13	0.13	0.21	0.21	0.21
Crit Moves:			****		****			****			****	
Delay/Veh:	9.4	9.4	9.4	15.5	15.5	15.5	9.4	9.4	9.4	9.7	9.7	9.7
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:	9.4	9.4	9.4	15.5	15.5	15.5	9.4	9.4	9.4	9.7	9.7	9.7
LOS by Move:	A	A	A	C	C	C	A	A	A	A	A	A
ApproachDel:		9.4			15.5			9.4			9.7	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.4			15.5			9.4			9.7	
LOS by Appr:		A			C			A			A	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #19 Edy/Borchers

Average Delay (sec/veh): 8.3 Worst Case Level Of Service: C[24.3]

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 1			1 0 1 0 0			0 0 0 1 0	
Volume Module:												
Base Vol:	0	0	0	280	0	67	23	251	0	0	275	147
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	280	0	67	23	251	0	0	275	147
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:	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 Volume:	0	0	0	280	0	67	23	251	0	0	275	147
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	280	0	67	23	251	0	0	275	147
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	646	xxxx	350	422	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	438	xxxx	696	1137	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	431	xxxx	696	1137	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.65	xxxx	0.10	0.02	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	4.5	xxxx	0.3	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	27.5	xxxx	10.7	8.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	D	*	B	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
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		xxxxxx			24.3			xxxxxx			xxxxxx	
ApproachLOS:		*			C			*			*	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #20 Sherwood/Langer

Cycle (sec): 60 Critical Vol./Cap. (X): 0.771
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 55.5
Optimal Cycle: 65 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:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	4	4	4	8	4	4	4	25	4	4	20	4
Lanes:	1 0	0 1	0	1 0	0 1	0	1 0	0 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	83	49	55	317	79	296	148	454	24	27	265	399
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:	83	49	55	317	79	296	148	454	24	27	265	399
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:	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 Volume:	83	49	55	317	79	296	148	454	24	27	265	399
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	83	49	55	317	79	296	148	454	24	27	265	399
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.:	83	49	55	317	79	296	148	454	24	27	265	399
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.93	0.90	0.90	0.92	0.86	0.86	0.93	0.97	0.97	0.90	0.82	0.82
Lanes:	1.00	0.47	0.53	1.00	0.21	0.79	1.00	0.95	0.05	1.00	1.00	1.00
Final Sat.:	1769	808	907	1753	343	1284	1769	1756	93	1702	1549	1549
Capacity Analysis Module:												
Vol/Sat:	0.05	0.06	0.06	0.18	0.23	0.23	0.08	0.26	0.26	0.02	0.17	0.26
Crit Moves:		****				****		****		****		
Green/Cycle:	0.07	0.07	0.07	0.18	0.18	0.18	0.15	0.42	0.42	0.07	0.33	0.33
Volume/Cap:	0.70	0.91	0.91	0.99	1.26	1.26	0.56	0.62	0.62	0.24	0.51	0.77
Delay/Veh:	44.9	84.5	84.5	70.8	165	164.5	26.3	15.3	15.3	27.6	16.4	22.3
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:	44.9	84.5	84.5	70.8	165	164.5	26.3	15.3	15.3	27.6	16.4	22.3
HCM2kAvg:	3	5	5	12	19	19	4	8	8	1	5	9

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #21 Sherwood/Century

Average Delay (sec/veh): 231.5 Worst Case Level Of Service: F[1532.1]

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	0 1	0	1 0	0 1	0	0 0	1!	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	23	464	90	169	618	43	25	58	59	90	35	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:	23	464	90	169	618	43	25	58	59	90	35	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:	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 Volume:	23	464	90	169	618	43	25	58	59	90	35	112
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	23	464	90	169	618	43	25	58	59	90	35	112
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	672	xxxx	xxxxx	567	xxxx	xxxxx	1626	1602	687	1640	1578	531
Potent Cap.:	923	xxxx	xxxxx	1005	xxxx	xxxxx	82	106	449	81	110	550
Move Cap.:	915	xxxx	xxxxx	994	xxxx	xxxxx	38	84	431	26	87	540
Volume/Cap:	0.03	xxxx	xxxx	0.17	xxxx	xxxx	0.66	0.69	0.14	3.47	0.40	0.21
Level Of Service Module:												
Queue:	0.1	xxxx	xxxxx	0.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	9.0	xxxx	xxxxx	9.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
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	96	xxxxx	xxxx	58	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	10.7	xxxxx	xxxxx	25.8	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	342	xxxxx	xxxxx	1532	xxxxx
Shared LOS:	*	*	*	*	*	*	*	F	*	*	F	*
ApproachDel:	xxxxxx			xxxxxx			342.1			1532.1		
ApproachLOS:	*			*			F			F		

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #22 Sherwood-Pine/3rd

Average Delay (sec/veh): 2.1   Worst Case Level Of Service: D[31.0]

Approach:	North Bound	South Bound	East Bound	West Bound
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 1! 0 0	0 0 0 0 0	0 0 0 1 0	0 1 0 0 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Volume Module:												
Base Vol:	55	0	22	0	0	0	0	625	112	46	508	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:	55	0	22	0	0	0	0	625	112	46	508	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:	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 Volume:	55	0	22	0	0	0	0	625	112	46	508	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	55	0	22	0	0	0	0	625	112	46	508	0
Critical Gap Module:												
Critical Gp:	6.4	xxxx	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1281	xxxx	681	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	737	xxxx	xxxxx
Potent Cap.:	184	xxxx	454	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	864	xxxx	xxxxx
Move Cap.:	177	xxxx	454	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	864	xxxx	xxxxx
Volume/Cap:	0.31	xxxx	0.05	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.05	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.2	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.4	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	214	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	1.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.2	xxxx	xxxxx
Shrd StpDel:	xxxxx	31.0	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.4	xxxx	xxxxx
Shared LOS:	*	D	*	*	*	*	*	*	*	A	*	*
ApproachDel:		31.0			xxxxxx			xxxxxx			xxxxxx	
ApproachLOS:		D			*			*			*	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #23 Pine/Oregon

Average Delay (sec/veh): 19.0   Worst Case Level Of Service: F[63.2]

Approach:	North Bound	South Bound	East Bound	West Bound
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 0 0 0	0 0 1! 0 0	0 1 0 0 0	0 0 0 1 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Volume Module:												
Base Vol:	0	0	0	80	0	277	276	362	0	0	290	28
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	80	0	277	276	362	0	0	290	28
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:	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 Volume:	0	0	0	80	0	277	276	362	0	0	290	28
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	80	0	277	276	362	0	0	290	28
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.3	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1237	xxxx	321	330	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	191	xxxx	713	1224	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	149	xxxx	703	1212	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.54	xxxx	0.39	0.23	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.8	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	384	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	10.0	xxxxx	0.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	63.2	xxxxx	8.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	F	*	A	*	*	*	*	*
ApproachDel:		xxxxxx			63.2			xxxxxx			xxxxxx	
ApproachLOS:		*			F			*			*	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #24 Washington/Railroad

Cycle (sec):	100	Critical Vol./Cap. (X):	0.609
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	12.4
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		
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 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	24	199	12	111	316	12	18	37	39	8	30	97
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:	24	199	12	111	316	12	18	37	39	8	30	97
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:	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 Volume:	24	199	12	111	316	12	18	37	39	8	30	97
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	24	199	12	111	316	12	18	37	39	8	30	97
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.:	24	199	12	111	316	12	18	37	39	8	30	97
Saturation Flow Module:												
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:	0.10	0.85	0.05	0.25	0.72	0.03	0.19	0.39	0.42	0.06	0.22	0.72
Final Sat.:	68	565	34	182	519	20	110	227	239	36	136	440
Capacity Analysis Module:												
Vol/Sat:	0.35	0.35	0.35	0.61	0.61	0.61	0.16	0.16	0.16	0.22	0.22	0.22
Crit Moves:		****			****			****			****	
Delay/Veh:	10.7	10.7	10.7	14.7	14.7	14.7	9.5	9.5	9.5	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:	10.7	10.7	10.7	14.7	14.7	14.7	9.5	9.5	9.5	9.6	9.6	9.6
LOS by Move:	B	B	B	B	B	B	A	A	A	A	A	A
ApproachDel:	10.7			14.7			9.5			9.6		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	10.7			14.7			9.5			9.6		
LOS by Appr:	B			B			A			A		

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #25 Washington/3rd

Cycle (sec):	100	Critical Vol./Cap. (X):	0.356
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	9.5
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		
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 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	22	7	1	15	74	120	82	157	24	3	148	4
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:	22	7	1	15	74	120	82	157	24	3	148	4
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:	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 Volume:	22	7	1	15	74	120	82	157	24	3	148	4
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	22	7	1	15	74	120	82	157	24	3	148	4
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.:	22	7	1	15	74	120	82	157	24	3	148	4
Saturation Flow Module:												
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:	0.74	0.23	0.03	0.07	0.35	0.58	0.31	0.60	0.09	0.02	0.95	0.03
Final Sat.:	454	145	21	53	260	421	230	441	67	14	677	18
Capacity Analysis Module:												
Vol/Sat:	0.05	0.05	0.05	0.29	0.29	0.29	0.36	0.36	0.36	0.22	0.22	0.22
Crit Moves:	****				****			****			****	
Delay/Veh:	8.5	8.5	8.5	9.3	9.3	9.3	10.1	10.1	10.1	9.1	9.1	9.1
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:	8.5	8.5	8.5	9.3	9.3	9.3	10.1	10.1	10.1	9.1	9.1	9.1
LOS by Move:	A	A	A	A	A	A	B	B	B	A	A	A
ApproachDel:	8.5			9.3			10.1			9.1		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	8.5			9.3			10.1			9.1		
LOS by Appr:	A			A			B			A		

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #26 Sherwood/Railroad

Cycle (sec):	100	Critical Vol./Cap. (X):	0.525
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	11.2
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		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 0 1 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	0	11	10	347	9	9	30	105	5	6	32	189
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	11	10	347	9	9	30	105	5	6	32	189
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:	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 Volume:	0	11	10	347	9	9	30	105	5	6	32	189
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	11	10	347	9	9	30	105	5	6	32	189
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.:	0	11	10	347	9	9	30	105	5	6	32	189
Saturation Flow Module:												
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:	0.00	0.52	0.48	0.96	0.02	0.02	0.21	0.75	0.04	0.03	0.14	0.83
Final Sat.:	0	340	309	661	17	17	134	469	22	19	103	611
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.03	0.03	0.52	0.52	0.52	0.22	0.22	0.22	0.31	0.31	0.31
Crit Moves:			****	****					****		****	
Delay/Veh:	0.0	8.2	8.2	13.0	13.0	13.0	9.8	9.8	9.8	9.5	9.5	9.5
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
AdjDel/Veh:	0.0	8.2	8.2	13.0	13.0	13.0	9.8	9.8	9.8	9.5	9.5	9.5
LOS by Move:	*	A	A	B	B	B	A	A	A	A	A	A
ApproachDel:		8.2			13.0			9.8			9.5	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		8.2			13.0			9.8			9.5	
LOS by Appr:		A			B			A			A	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #27 Cipole/Herman

Cycle (sec):	100	Critical Vol./Cap. (X):	0.411
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	10.2
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		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1! 0 0			0 0 0 0 0			0 0 0 1 0			0 1 0 0 0		
Volume Module:												
Base Vol:	166	0	52	0	0	0	0	56	129	141	156	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:	166	0	52	0	0	0	0	56	129	141	156	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:	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 Volume:	166	0	52	0	0	0	0	56	129	141	156	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	166	0	52	0	0	0	0	56	129	141	156	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	1.00	1.00	1.00	1.00	1.00
Final Vol.:	166	0	52	0	0	0	0	56	129	141	156	0
Saturation Flow Module:												
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:	0.76	0.00	0.24	0.00	0.00	0.00	0.00	0.30	0.70	0.47	0.53	0.00
Final Sat.:	512	0	160	0	0	0	0	232	534	343	379	0
Capacity Analysis Module:												
Vol/Sat:	0.32	xxxx	0.32	xxxx	xxxx	xxxx	xxxx	0.24	0.24	0.41	0.41	xxxx
Crit Moves:	****								****	****		
Delay/Veh:	10.3	0.0	10.3	0.0	0.0	0.0	0.0	8.8	8.8	11.0	11.0	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:	10.3	0.0	10.3	0.0	0.0	0.0	0.0	8.8	8.8	11.0	11.0	0.0
LOS by Move:	B	*	B	*	*	*	*	A	A	B	B	*
ApproachDel:		10.3			xxxxxx			8.8			11.0	
Delay Adj:		1.00			xxxxx			1.00			1.00	
ApprAdjDel:		10.3			xxxxxx			8.8			11.0	
LOS by Appr:		B			*			A			B	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
FHWA Roundabout Method (Base Volume Alternative)

Intersection #28 Meinecke/Dewey

Average Delay (sec/veh): 4.0 Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Control:	Yield Sign	Yield Sign	Yield Sign	Yield Sign
Lanes:	0	1	1	1

Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	0	0	196	0	134	52	38	0	0	53	156
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	196	0	134	52	38	0	0	53	156
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:	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 Volume:	0	0	0	196	0	134	52	38	0	0	53	156
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	196	0	134	52	38	0	0	53	156
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.:	0	0	0	196	0	134	52	38	0	0	53	156
PCE Module:												
AutoPCE:	0	0	0	194	0	133	52	38	0	0	52	153
TruckPCE:	0	0	0	3	0	2	0	0	0	0	2	5
ComboPCE:	0	0	0	0	0	0	0	0	0	0	0	0
BicyclePCE:	0	0	0	0	0	0	0	0	0	0	0	0
AdjVolume:	0	0	0	197	0	135	52	38	0	0	54	158

Delay Module: >> Time Period: 0.25 hours <<

	North Bound	South Bound	East Bound	West Bound
CircVolume:	287	54	197	52
MaxVolume:	xxxxxx	1171	1094	1172
PedVolume:	0	0	0	0
AdjMaxVol:	xxxxxx	1171	1094	1172
ApproachVol:	xxxxxx	332	90	211
ApproachDel:	xxxxxx	4.3	3.6	3.7
Queue:	xxxx	1.2	0.3	0.7

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #29 Brookman/Ladd Hill

Average Delay (sec/veh): 3.4 Worst Case Level Of Service: B[11.1]

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:	61	86	0	0	105	105	57	0	39	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:	61	86	0	0	105	105	57	0	39	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:	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 Volume:	61	86	0	0	105	105	57	0	39	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	61	86	0	0	105	105	57	0	39	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	6.3	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.6	xxxx	3.4	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	210	xxxx	xxxxx	xxxx	xxxx	xxxxx	366	xxxx	158	xxxx	xxxx	xxxxx
Potent Cap.:	1367	xxxx	xxxxx	xxxx	xxxx	xxxxx	624	xxxx	875	xxxx	xxxx	xxxxx
Move Cap.:	1367	xxxx	xxxxx	xxxx	xxxx	xxxxx	602	xxxx	875	xxxx	xxxx	xxxxx
Volume/Cap:	0.04	xxxx	xxxx	xxxx	xxxx	xxxx	0.09	xxxx	0.04	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	7.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	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	690	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.5	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	7.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	11.1	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	B	*	*	*	*
ApproachDel:		xxxxxx			xxxxxx			11.1			xxxxxx	
ApproachLOS:		*			*			B			*	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #30 Sunset/Pine

Average Delay (sec/veh): 3.0 Worst Case Level Of Service: D[27.2]

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 1 0 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	5	2	0	92	1	11	13	317	8	1	527	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:	5	2	0	92	1	11	13	317	8	1	527	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:	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 Volume:	5	2	0	92	1	11	13	317	8	1	527	67
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	5	2	0	92	1	11	13	317	8	1	527	67
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	930	945	xxxxx	913	916	577	596	xxxx	xxxxx	325	xxxx	xxxxx
Potent Cap.:	250	264	xxxxx	254	272	517	985	xxxx	xxxxx	1240	xxxx	xxxxx
Move Cap.:	238	260	xxxxx	250	268	510	984	xxxx	xxxxx	1240	xxxx	xxxxx
Volume/Cap:	0.02	0.01	xxxx	0.37	0.00	0.02	0.01	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.0	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.7	xxxx	xxxxx	7.9	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	244	xxxx	xxxxx	xxxx	264	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.1	xxxx	xxxxx	xxxxx	1.8	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	20.2	xxxx	xxxxx	xxxxx	27.2	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	C	*	*	*	D	*	*	*	*	*	*	*
ApproachDel:		20.2			27.2			xxxxxx			xxxxxx	
ApproachLOS:		C			D			*			*	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #31 Sunset/Pinehurst

Cycle (sec): 100 Critical Vol./Cap. (X): 0.728
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 15.8
Optimal Cycle: 0 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			Stop Sign			Stop Sign		
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			1 0 0 1 0			1 0 0 1 0		
Volume Module:												
Base Vol:	25	17	42	70	20	15	56	295	41	84	358	123
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	17	42	70	20	15	56	295	41	84	358	123
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:	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 Volume:	25	17	42	70	20	15	56	295	41	84	358	123
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	25	17	42	70	20	15	56	295	41	84	358	123
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.:	25	17	42	70	20	15	56	295	41	84	358	123
Saturation Flow Module:												
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:	0.30	0.20	0.50	0.67	0.19	0.14	1.00	0.88	0.12	1.00	0.74	0.26
Final Sat.:	155	106	261	343	98	73	561	547	76	583	492	169
Capacity Analysis Module:												
Vol/Sat:	0.16	0.16	0.16	0.20	0.20	0.20	0.10	0.54	0.54	0.14	0.73	0.73
Crit Moves:		****			****			****			****	
Delay/Veh:	10.1	10.1	10.1	10.7	10.7	10.7	9.6	14.5	14.5	9.8	20.6	20.6
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:	10.1	10.1	10.1	10.7	10.7	10.7	9.6	14.5	14.5	9.8	20.6	20.6
LOS by Move:	B	B	B	B	B	B	A	B	B	A	C	C
ApproachDel:		10.1			10.7			13.8			19.0	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		10.1			10.7			13.8			19.0	
LOS by Appr:		B			B			B			C	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #32 Sunset/Woodhaven

Average Delay (sec/veh): 6.9   Worst Case Level Of Service: E[38.8]

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 1 0 1			1 0 0 1 0		
Volume Module:												
Base Vol:	11	4	5	50	4	114	204	455	26	3	351	54
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:	11	4	5	50	4	114	204	455	26	3	351	54
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:	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 Volume:	11	4	5	50	4	114	204	455	26	3	351	54
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	11	4	5	50	4	114	204	455	26	3	351	54
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1320	1284	460	1270	1283	392	410	xxxx	xxxxx	486	xxxx	xxxxx
Potent Cap.:	133	164	599	145	166	659	1160	xxxx	xxxxx	1077	xxxx	xxxxx
Move Cap.:	92	134	597	121	135	651	1155	xxxx	xxxxx	1072	xxxx	xxxxx
Volume/Cap:	0.12	0.03	0.01	0.41	0.03	0.18	0.18	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.6	xxxx	xxxxx	0.0	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.8	xxxx	xxxxx	8.4	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	126	xxxxx	xxxx	272	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.5	xxxxx	xxxxx	3.7	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	38.8	xxxxx	xxxxx	37.3	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	E	*	*	E	*	*	*	*	*	*	*
ApproachDel:		38.8			37.3			xxxxxx			xxxxxx	
ApproachLOS:		E			E			*			*	

Sherwood TSP
Future (2020) PM Peak
No-Build Scenario

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #33 Elwert/Swanstrom

Average Delay (sec/veh): 0.6   Worst Case Level Of Service: B[11.1]

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			0 1 0 0 0			0 0 0 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	0	147	13	13	425	0	0	0	0	11	0	11
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	147	13	13	425	0	0	0	0	11	0	11
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:	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 Volume:	0	147	13	13	425	0	0	0	0	11	0	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	147	13	13	425	0	0	0	0	11	0	11
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	160	xxxx	xxxxx	xxxx	xxxx	xxxxx	605	xxxx	154
Potent Cap.:	xxxx	xxxx	xxxxx	1425	xxxx	xxxxx	xxxx	xxxx	xxxxx	464	xxxx	898
Move Cap.:	xxxx	xxxx	xxxxx	1425	xxxx	xxxxx	xxxx	xxxx	xxxxx	461	xxxx	898
Volume/Cap:	xxxx	xxxx	xxxx	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	0.02	xxxx	0.01
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	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	609	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	11.1	xxxxx
Shared LOS:	*	*	*	A	*	*	*	*	*	*	B	*
ApproachDel:		xxxxxx			xxxxxx			xxxxxx			11.1	
ApproachLOS:		*			*			*			B	

```
------------------------------------------------------------------------------
                               Sherwood TSP
                           Future (2020) PM Peak
                            No-Build Scenario
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #34 Elwert/Kruger
******************************************************************************
Average Delay (sec/veh):        9.1     Worst Case Level Of Service:     B[ 13.5]
******************************************************************************
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  0  0  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      21    0   172     0    0     0     0    5    23   413    4     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:   21    0   172     0    0     0     0    5    23   413    4     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:     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 Volume:    21    0   172     0    0     0     0    5    23   413    4     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    21    0   172     0    0     0     0    5    23   413    4     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  6.6   6.3   7.1  6.5 xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  4.1   3.4   3.5  4.0 xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:    0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx  214     0   131  128 xxxxx
Potent Cap.:    0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx  666     0   844  764 xxxxx
Move Cap.:      0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx  666     0   840  764 xxxxx
Volume/Cap:  0.00 xxxx  xxxx  xxxx xxxx  xxxx  xxxx 0.01  0.00  0.49 0.01  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx 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  3732   839 xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   0.0   2.8 xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.0  13.5 xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     A     B    *     *
ApproachDel:       xxxxxx           xxxxxx             6.0             13.5
ApproachLOS:          *                *                A                B
```



```
------------------------------------------------------------------------------
                               Sherwood TSP
                           Future (2020) PM Peak
                            No-Build Scenario
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #35 Oregon/Lincoln
******************************************************************************
Average Delay (sec/veh):        0.7     Worst Case Level Of Service:     B[ 13.2]
******************************************************************************
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  0  0  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      14    0     6     0    0     0     0  275    27    26  337     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:   14    0     6     0    0     0     0  275    27    26  337     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:     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 Volume:    14    0     6     0    0     0     0  275    27    26  337     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    14    0     6     0    0     0     0  275    27    26  337     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  6.5 xxxx   6.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.6 xxxx   3.4 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  691 xxxx   290  xxxx xxxx xxxxx  xxxx xxxx xxxxx   303 xxxx xxxxx
Potent Cap.:  403 xxxx   738  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1258 xxxx xxxxx
Move Cap.:    392 xxxx   737  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1257 xxxx xxxxx
Volume/Cap:  0.04 xxxx  0.01  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.02 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx  456 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.1 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Shrd StpDel:xxxxx 13.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx
Shared LOS:     *    B     *     *    *     *     *    *     *     A    *     *
ApproachDel:        13.2           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:          B                *                *                *
```

Sherwood TSP
Future (2020) PM Peak
Build

Scenario Report

Scenario:	2020 PM Peak
Command:	2020 PM Peak
Volume:	Default Volume
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Paths
Routes:	Default Routes
Configuration:	Default Configuration

Sherwood TSP
Future (2020) PM Peak
S31000

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 ORE 99W/Home Depot	B	17.9	0.759	B	17.9	0.759	+ 0.000 D/V
# 2 ORE 99W/Tualatin-Sherwood Rd	D	43.9	0.864	D	43.9	0.864	+ 0.000 D/V
# 3 ORE 99W/Sherwood Blvd	D	38.1	0.801	D	38.1	0.801	+ 0.000 D/V
# 4 ORE 99W/Meinecke	B	16.4	0.717	B	16.4	0.717	+ 0.000 D/V
# 5 ORE 99W/Sunset	C	31.3	0.849	C	31.3	0.849	+ 0.000 D/V
# 6 ORE 99W/Brookman	F	102.9	0.000	F	102.9	0.000	+ 0.000 D/V
# 7 Tualatin-Sherwood/Cipole	B	15.7	0.562	B	15.7	0.562	+ 0.000 D/V
# 8 Tualatin-Sherwood/Oregon	C	22.1	0.753	C	22.1	0.753	+ 0.000 D/V
# 9 Tualatin-Sherwood/Gerda	F	64.2	0.000	F	64.2	0.000	+ 0.000 D/V
# 10 Tualatin-Sherwood/Langer	B	16.3	0.469	B	16.3	0.469	+ 0.000 D/V
# 11 Tualatin-Sherwood/Regal Cinema	B	19.3	0.518	B	19.3	0.518	+ 0.000 D/V
# 12 Roy Rogers/Borchers	A	7.6	0.559	A	7.6	0.559	+ 0.000 D/V
# 13 Oregon/Tonquin	E	35.3	0.000	E	35.3	0.000	+ 0.000 D/V
# 14 Oregon/Murdock	A	6.0	0.000	A	6.0	0.000	+ 0.000 V/C
# 15 Murdock/Willamette	B	13.4	0.000	B	13.4	0.000	+ 0.000 D/V
# 16 Sunset/Murdock	B	10.2	0.393	B	10.2	0.393	+ 0.000 V/C
# 17 Sunset/Sherwood	C	23.0	0.832	C	23.0	0.832	+ 0.000 V/C
# 18 Edy/Elwert	B	11.4	0.566	B	11.4	0.566	+ 0.000 V/C
# 19 Edy/Borchers	C	19.9	0.000	C	19.9	0.000	+ 0.000 D/V
# 20 Sherwood/Langer	D	39.0	0.611	D	39.0	0.611	+ 0.000 D/V
# 21 Sherwood/Century	F	77.4	0.000	F	77.4	0.000	+ 0.000 D/V
# 22 Sherwood-Pine/3rd	D	25.6	0.000	D	25.6	0.000	+ 0.000 D/V
# 23 Pine/Oregon	D	25.5	0.000	D	25.5	0.000	+ 0.000 D/V

Sherwood TSP
Future (2020) PM Peak
S31000

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 24 Washington/Railroad	A	7.8	0.188	A	7.8	0.188	+ 0.000 V/C
# 25 Washington/3rd	A	7.5	0.120	A	7.5	0.120	+ 0.000 V/C
# 26 Sherwood/Railroad	B	10.7	0.448	B	10.7	0.448	+ 0.000 V/C
# 27 Cipole/Herman	A	9.2	0.284	A	9.2	0.284	+ 0.000 V/C
# 28 Meinecke/Dewey	A	3.7	0.000	A	3.7	0.000	+ 0.000 V/C
# 29 Brookman/Ladd Hill	B	10.2	0.000	B	10.2	0.000	+ 0.000 D/V
# 30 Sunset/Pine	C	21.4	0.000	C	21.4	0.000	+ 0.000 D/V
# 31 Sunset/Pinehurst	B	13.5	0.635	B	13.5	0.635	+ 0.000 V/C
# 32 Sunset/Woodhaven	D	30.9	0.000	D	30.9	0.000	+ 0.000 D/V
# 33 Elwert/Swanstrom	B	10.8	0.000	B	10.8	0.000	+ 0.000 D/V
# 34 Elwert/Kruger	B	12.5	0.000	B	12.5	0.000	+ 0.000 D/V
# 35 Oregon/Lincoln	B	11.4	0.000	B	11.4	0.000	+ 0.000 D/V

Sherwood TSP
Future (2020) PM Peak
S31C00

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 ORE 99W/Home Depot

Cycle (sec): 120 Critical Vol./Cap. (X): 0.759
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 17.9
Optimal Cycle: 72 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 2 0 1			1 0 1 1 0			0 1 0 0 1			0 1 0 0 1		
Volume Module:												
Base Vol:	23	833	104	99	1930	12	60	1	31	150	0	91
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:	23	833	104	99	1930	12	60	1	31	150	0	91
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:	23	833	104	99	1930	12	60	1	31	150	0	91
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:	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 Volume:	23	833	104	99	1930	12	60	1	31	150	0	91
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	833	104	99	1930	12	60	1	31	150	0	91
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.:	23	833	104	99	1930	12	60	1	31	150	0	91
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1500	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.80	0.93	0.93	0.93	0.48	0.48	0.85	0.66	1.00	0.83
Lanes:	1.00	2.00	1.00	1.00	1.99	0.01	0.98	0.02	1.00	1.00	0.00	1.00
Final Sat.:	1702	3404	1523	1769	3512	22	888	15	1615	1248	0	1583
Capacity Analysis Module:												
Vol/Sat:	0.01	0.24	0.07	0.06	0.55	0.55	0.07	0.07	0.02	0.12	0.00	0.06
Crit Moves:	****				****					****		
Green/Cycle:	0.02	0.60	0.60	0.14	0.72	0.72	0.16	0.16	0.16	0.16	0.00	0.16
Volume/Cap:	0.76	0.41	0.11	0.41	0.76	0.76	0.43	0.43	0.12	0.76	0.00	0.36
Delay/Veh:	129.3	12.6	10.2	48.3	11.5	11.5	47.6	47.6	43.5	63.9	0.0	46.0
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:	129.3	12.6	10.2	48.3	11.5	11.5	47.6	47.6	43.5	63.9	0.0	46.0
HCM2kAvg:	2	8	2	4	23	27	5	4	1	10	0	3

Sherwood TSP
Future (2020) PM Peak
S31000

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #2 ORE 99W/Tualatin-Sherwood Rd

Cycle (sec): 120   Critical Vol./Cap. (X): 0.864
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 43.9
Optimal Cycle: 113   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			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 3 0 1			1 0 2 1 0			1 0 1 1 0			2 0 1 1 0		
Volume Module:												
Base Vol:	159	788	494	176	1515	274	126	284	117	568	321	131
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:	159	788	494	176	1515	274	126	284	117	568	321	131
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:	159	788	494	176	1515	274	126	284	117	568	321	131
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:	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 Volume:	159	788	494	176	1515	274	126	284	117	568	321	131
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	159	788	494	176	1515	274	126	284	117	568	321	131
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.:	159	788	494	176	1515	274	126	284	117	568	321	131
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.86	0.80	0.93	0.87	0.87	0.87	0.83	0.83	0.89	0.87	0.87
Lanes:	1.00	3.00	1.00	1.00	2.54	0.46	1.00	1.42	0.58	2.00	1.42	0.58
Final Sat.:	1702	4891	1523	1759	4206	761	1655	2241	923	3369	2360	963
Capacity Analysis Module:												
Vol/Sat:	0.09	0.16	0.32	0.10	0.36	0.36	0.08	0.13	0.13	0.17	0.14	0.14
Crit Moves:	****				****			****		****		
Green/Cycle:	0.11	0.40	0.40	0.12	0.42	0.42	0.15	0.15	0.15	0.20	0.20	0.20
Volume/Cap:	0.86	0.40	0.81	0.81	0.86	0.86	0.52	0.86	0.86	0.86	0.70	0.70
Delay/Veh:	84.6	25.7	39.6	70.8	36.0	36.0	49.3	65.5	65.5	58.2	48.3	48.3
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:	84.6	25.7	39.6	70.8	36.0	36.0	49.3	65.5	65.5	58.2	48.3	48.3
HCM2kAvg:	9	7	18	9	23	23	5	10	10	13	9	9

Sherwood TSP
Future (2020) PM Peak
S31000

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 ORE 99W/Sherwood Blvd

Cycle (sec): 120   Critical Vol./Cap. (X): 0.801
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 38.1
Optimal Cycle: 93   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			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2 1 0			1 0 2 1 0			1 0 1 0 1			1 1 0 0 1		
Volume Module:												
Base Vol:	73	1406	106	240	1715	146	137	240	144	265	191	88
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:	73	1406	106	240	1715	146	137	240	144	265	191	88
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:	73	1406	106	240	1715	146	137	240	144	265	191	88
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:	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 Volume:	73	1406	106	240	1715	146	137	240	144	265	191	88
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	73	1406	106	240	1715	146	137	240	144	265	191	88
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.:	73	1406	106	240	1715	146	137	240	144	265	191	88
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	0.87	0.87	0.93	0.88	0.88	0.94	0.99	0.84	0.96	0.96	0.84
Lanes:	1.00	2.79	0.21	1.00	2.76	0.24	1.00	1.00	1.00	1.16	0.84	1.00
Final Sat.:	1736	4594	346	1769	4628	394	1787	1881	1599	2125	1532	1599
Capacity Analysis Module:												
Vol/Sat:	0.04	0.31	0.31	0.14	0.37	0.37	0.08	0.13	0.09	0.12	0.12	0.06
Crit Moves:		****		****				****			****	
Green/Cycle:	0.06	0.38	0.38	0.17	0.50	0.50	0.16	0.16	0.16	0.16	0.16	0.16
Volume/Cap:	0.75	0.80	0.80	0.80	0.75	0.75	0.48	0.80	0.57	0.80	0.80	0.35
Delay/Veh:	82.7	35.5	35.5	62.1	25.6	25.6	47.2	62.8	49.5	56.8	56.8	46.1
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:	82.7	35.5	35.5	62.1	25.6	25.6	47.2	62.8	49.5	56.8	56.8	46.1
HCM2kAvg:	4	18	18	11	19	19	5	11	6	10	10	3

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #4 ORE 99W/Meinecke

Cycle (sec):	120	Critical Vol./Cap. (X):	0.717
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	16.4
Optimal Cycle:	64	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	2 0	1	1 0	2 0	1	1 0	1 0	1	1 0	1 0	1
Volume Module:												
Base Vol:	11	1375	53	252	2017	47	15	13	15	56	11	108
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:	11	1375	53	252	2017	47	15	13	15	56	11	108
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:	11	1375	53	252	2017	47	15	13	15	56	11	108
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:	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 Volume:	11	1375	53	252	2017	47	15	13	15	56	11	108
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	1375	53	252	2017	47	15	13	15	56	11	108
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	1375	53	252	2017	47	15	13	15	56	11	108
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.81	0.93	0.93	0.83	0.76	1.00	0.85	0.74	0.97	0.83
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1718	3437	1537	1769	3538	1583	1444	1900	1615	1398	1845	1568
Capacity Analysis Module:												
Vol/Sat:	0.01	0.40	0.03	0.14	0.57	0.03	0.01	0.01	0.01	0.04	0.01	0.07
Crit Moves:	****				****							****
Green/Cycle:	0.01	0.59	0.59	0.21	0.80	0.80	0.10	0.10	0.10	0.10	0.10	0.10
Volume/Cap:	0.72	0.67	0.06	0.67	0.72	0.04	0.11	0.07	0.10	0.42	0.06	0.72
Delay/Veh:	155.1	17.5	10.3	46.4	6.8	2.6	49.9	49.5	49.8	53.2	49.5	67.9
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:	155.1	17.5	10.3	48.4	6.8	2.6	49.9	49.5	49.8	53.2	49.5	67.9
HCM2kAvg:	1	18	1	10	18	0	1	0	1	1	0	5

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #5 ORE 99W/Sunset

Cycle (sec):	120	Critical Vol./Cap. (X):	0.849
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	31.3
Optimal Cycle:	97	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			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	1	2 0	2 0	1	0 1	0 0	1	0 1	0 0	1
Volume Module:												
Base Vol:	87	1204	146	330	1764	27	16	156	204	137	97	190
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:	87	1204	146	330	1764	27	16	156	204	137	97	190
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:	87	1204	146	330	1764	27	16	156	204	137	97	190
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:	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 Volume:	87	1204	146	330	1764	27	16	156	204	137	97	190
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	87	1204	146	330	1764	27	16	156	204	137	97	190
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.:	87	1204	146	330	1764	27	16	156	204	137	97	190
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.81	0.90	0.93	0.83	0.94	0.94	0.83	0.57	0.57	0.83
Lanes:	1.00	2.00	1.00	2.00	2.00	1.00	0.09	0.91	1.00	0.59	0.41	1.00
Final Sat.:	1718	3437	1537	3432	3538	1583	167	1628	1583	638	452	1568
Capacity Analysis Module:												
Vol/Sat:	0.05	0.35	0.09	0.10	0.50	0.02	0.10	0.10	0.13	0.21	0.21	0.12
Crit Moves:	****				****						****	
Green/Cycle:	0.06	0.51	0.51	0.14	0.59	0.59	0.25	0.25	0.25	0.25	0.25	0.25
Volume/Cap:	0.85	0.69	0.19	0.69	0.85	0.03	0.38	0.38	0.51	0.85	0.85	0.48
Delay/Veh:	100.9	23.6	16.2	53.4	23.9	10.4	37.6	37.6	39.5	63.8	63.8	39.0
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:	100.9	23.6	16.2	53.4	23.9	10.4	37.6	37.6	39.5	63.8	63.8	39.0
HCM2kAvg:	6	17	3	7	29	0	6	5	7	16	17	6

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 ORE 99W/Brookman

Average Delay (sec/veh): 3.7   Worst Case Level Of Service: F[102.9]

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 1 0			1 0 1 1 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	18	1369	38	27	1946	28	26	1	25	63	5	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:	18	1369	38	27	1946	28	26	1	25	63	5	3
Added Vol:	0	0	0	C	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	18	1369	38	27	1946	28	26	1	25	63	5	3
User Adj:	1.00	1.00	1.00	1.0C	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.0C	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	18	1369	38	27	1946	28	26	1	25	63	5	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	18	1369	38	27	1946	28	26	1	25	63	5	3
Critical Gap Module:												
Critical Gp:	4.2	xxxx	xxxxx	4.1	xxxx	xxxxx	7.5	6.5	6.9	7.6	6.6	7.0
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	1974	xxxx	xxxxx	1407	xxxx	xxxxx	2737	3457	987	2451	3452	704
Potent Cap.:	282	xxxx	xxxxx	481	xxxx	xxxxx	10	7	246	15	6	375
Move Cap.:	282	xxxx	xxxxx	481	xxxx	xxxxx	2	6	246	11	6	375
Total Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	53	75	xxxxx	100	64	xxxxx
Volume/Cap:	0.06	xxxx	xxxx	0.06	xxxx	xxxx	0.49	0.01	0.10	0.63	0.08	0.01
Level Of Service Module:												
Queue:	0.2	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	18.6	xxxx	xxxxx	12.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	C	*	*	B	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	86	xxxxx	xxxx	99	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	2.8	xxxxx	xxxxx	3.7	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	97.7	xxxxx	xxxxx	103	xxxxx
Shared LOS:	*	*	*	*	*	*	*	F	*	*	F	*
ApproachDel:		xxxxxx			xxxxxx			97.7			102.9	
ApproachLOS:		*			*			F			F	

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #7 Tualatin-Sherwood/Cipole

Cycle (sec): 120   Critical Vol./Cap. (X): 0.562
Loss Time (sec): 12 (Y+R = 4 sec)   Average Delay (sec/veh): 15.7
Optimal Cycle: 46   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:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 0 0 0			1 0 0 0 1			1 0 2 0 0			0 0 1 1 0		
Volume Module:												
Base Vol:	0	0	0	96	0	170	80	1054	0	0	1141	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:	0	0	0	96	0	170	80	1054	0	0	1141	51
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:	0	0	0	96	0	170	80	1054	0	0	1141	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:	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 Volume:	0	0	0	96	0	170	80	1054	0	0	1141	51
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	96	0	170	80	1054	0	0	1141	51
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.:	0	0	0	96	0	170	80	1054	0	0	1141	51
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.90	1.00	0.81	0.91	0.91	1.00	1.00	0.90	0.90
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.91	0.09
Final Sat.:	0	0	0	1718	0	1537	1736	3473	0	0	3270	146
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.06	0.00	0.11	0.05	0.30	0.00	0.00	0.35	0.35
Crit Moves:						****	****				****	
Green/Cycle:	0.00	0.00	0.00	0.20	0.00	0.20	0.08	0.70	0.00	0.00	0.62	0.62
Volume/Cap:	0.00	0.00	0.00	0.28	0.00	0.56	0.56	0.43	0.00	0.00	0.56	0.56
Delay/Veh:	0.0	0.0	0.0	41.5	0.0	45.9	58.0	7.7	0.0	0.0	13.6	13.6
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:	0.0	0.0	0.0	41.5	0.0	45.9	58.0	7.7	0.0	0.0	13.6	13.6
HCM2kAvg:	0	0	0	3	0	6	4	8	0	0	13	12

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                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #8 Tualatin-Sherwood/Oregon
*****************************************************************************
Cycle (sec):        120              Critical Vol./Cap. (X):        0.753
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):      22.1
Optimal Cycle:       71              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:            Ovl            Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:       1  0  0  1  0   0  0  1! 0  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     117    6  161    10   11    1     3 1090   93   387 1263    5
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    6  161    10   11    1     3 1090   93   387 1263    5
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:  117    6  161    10   11    1     3 1090   93   387 1263    5
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:     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 Volume:   117    6  161    10   11    1     3 1090   93   387 1263    5
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  117    6  161    10   11    1     3 1090   93   387 1263    5
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.:   117    6  161    10   11    1     3 1090   93   387 1263    5
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.72 0.82 0.82  0.82 0.82 0.82  0.90 0.89 0.89  0.93 0.93 0.93
Lanes:       1.00 0.04 0.96  0.45 0.50 0.05  1.00 1.84 0.16  1.00 1.99 0.01
Final Sat.:  1371   56 1507   707  778   71  1702 3099  264  1769 3520   14
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09 0.11 0.11  0.01 0.01 0.01  0.00 0.35 0.35  0.22 0.36 0.36
Crit Moves:       ****                            ****         ****
Green/Cycle: 0.14 0.14 0.43  0.14 0.14 0.14  0.00 0.47 0.47  0.29 0.75 0.75
Volume/Cap:  0.60 0.75 0.25  0.10 0.10 0.10  0.48 0.75 0.75  0.75 0.48 0.48
Delay/Veh:   53.5 63.0 21.8  45.0 45.0 45.0 107.1 28.4 28.4  44.8  5.8  5.8
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:  53.5 63.0 21.8  45.0 45.0 45.0 107.1 28.4 28.4  44.8  5.8  5.8
HCM2kAvg:       6    7    4     1    1    1     1   19   19    15    9    7
*****************************************************************************
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-----------------------------------------------------------------------------
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                   Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*****************************************************************************
Intersection #9 Tualatin-Sherwood/Gerda
*****************************************************************************
Average Delay (sec/veh):        3.7    Worst Case Level Of Service:    F[ 64.2]
*****************************************************************************
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  1   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0    0    53    0   76    33  956    0     0 1187   47
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    53    0   76    33  956    0     0 1187   47
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:    0    0    0    53    0   76    33  956    0     0 1187   47
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:     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 Volume:     0    0    0    53    0   76    33  956    0     0 1187   47
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Final Vol.:     0    0    0    53    0   76    33  956    0     0 1187   47
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx  6.9   4.2 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx  3.3   2.3 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1755 xxxx  617  1234 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx    76 xxxx  433   539 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx    73 xxxx  433   539 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.73 xxxx 0.18  0.06 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   3.4 xxxx  0.6   0.2 xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx 134.7 xxxx 15.1  12.1 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *    *     F    *    C     B    *    *     *    *    *
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
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *    *     *    *    *     *    *    *     *    *    *
ApproachDel:      xxxxxx             64.2             xxxxxx           xxxxxx
ApproachLOS:         *                 F                *                *
```

Sherwood TSP
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #10 Tualatin-Sherwood/Langer

Cycle (sec):	120	Critical Vol./Cap. (X):	0.469
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	16.3
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			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 1 1 0			1 0 1 1 0	
Volume Module:												
Base Vol:	9	3	122	7	7	11	7	849	12	145	971	10
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:	9	3	122	7	7	11	7	849	12	145	971	10
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:	9	3	122	7	7	11	7	849	12	145	971	10
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:	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 Volume:	9	3	122	7	7	11	7	849	12	145	971	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	9	3	122	7	7	11	7	849	12	145	971	10
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.:	9	3	122	7	7	11	7	849	12	145	971	10
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.72	0.81	0.81	0.53	0.85	0.85	0.88	0.88	0.88	0.92	0.92	0.92
Lanes:	1.00	0.02	0.98	1.00	0.39	0.61	1.00	1.97	0.03	1.00	1.98	0.02
Final Sat.:	1364	37	1508	998	627	986	1671	3290	46	1753	3466	36
Capacity Analysis Module:												
Vol/Sat:	0.01	0.08	0.08	0.01	0.01	0.01	0.00	0.26	0.26	0.08	0.28	0.28
Crit Moves:		****						****		****		
Green/Cycle:	0.17	0.17	0.17	0.17	0.17	0.17	0.01	0.55	0.55	0.18	0.72	0.72
Volume/Cap:	0.04	0.47	0.47	0.04	0.06	0.06	0.39	0.47	0.47	0.47	0.39	0.39
Delay/Veh:	41.4	46.0	46.0	41.5	41.6	41.6	72.5	16.5	16.5	45.5	6.8	6.8
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:	41.4	46.0	46.0	41.5	41.6	41.6	72.5	16.5	16.5	45.5	6.8	6.8
HCM2kAvg:	0	5	5	0	1	1	1	10	9	5	7	7

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Tualatin-Sherwood/Regal Cinema

Cycle (sec):	120	Critical Vol./Cap. (X):	0.518
Loss Time (sec):	16 (Y+R = 4 sec)	Average Delay (sec/veh):	19.3
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:		Split Phase			Split Phase			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 1 0 1			2 0 1 1 0			1 0 1 1 0	
Volume Module:												
Base Vol:	139	13	69	2	18	22	28	770	197	101	913	8
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:	139	13	69	2	18	22	28	770	197	101	913	8
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:	139	13	69	2	18	22	28	770	197	101	913	8
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:	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 Volume:	139	13	69	2	18	22	28	770	197	101	913	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	139	13	69	2	18	22	28	770	197	101	913	8
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.:	139	13	69	2	18	22	28	770	197	101	913	8
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.93	0.86	0.86	0.94	0.99	0.84	0.85	0.85	0.85	0.91	0.91	0.91
Lanes:	1.00	0.16	0.84	1.00	1.00	1.00	2.00	1.59	0.41	1.00	1.98	0.02
Final Sat.:	1769	258	1369	1787	1881	1599	3243	2579	660	1736	3439	30
Capacity Analysis Module:												
Vol/Sat:	0.08	0.05	0.05	0.00	0.01	0.01	0.01	0.30	0.30	0.06	0.27	0.27
Crit Moves:	****					****		****		****		
Green/Cycle:	0.15	0.15	0.15	0.03	0.03	0.03	0.02	0.58	0.58	0.11	0.67	0.67
Volume/Cap:	0.52	0.33	0.33	0.04	0.36	0.52	0.40	0.52	0.52	0.52	0.40	0.40
Delay/Veh:	48.6	46.3	46.3	57.3	61.8	68.5	61.6	15.6	15.6	52.6	9.2	9.2
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:	48.6	46.3	46.3	57.3	61.8	68.5	61.6	15.6	15.6	52.6	9.2	9.2
HCM2kAvg:	6	3	3	0	1	2	1	11	11	4	8	7

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                    Level Of Service Computation Report
         2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Roy Rogers/Borchers
********************************************************************************
Cycle (sec):           60              Critical Vol./Cap. (X):          0.559
Loss Time (sec):       12 (Y+R =  4 sec) Average Delay (sec/veh):          7.6
Optimal Cycle:         41              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:        Split Phase      Split Phase       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  0  0  1  0    1  0  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      96     0    21     0     0     0     0   488   166    21   576     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:   96     0    21     0     0     0     0   488   166    21   576     0
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:   96     0    21     0     0     0     0   488   166    21   576     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:     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 Volume:    96     0    21     0     0     0     0   488   166    21   576     0
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   96     0    21     0     0     0     0   488   166    21   576     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  1.00  1.00  1.00  1.00  1.00
Final Vol.:    96     0    21     0     0     0     0   488   166    21   576     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  0.91  1.00  0.82  1.00  1.00  1.00  1.00  0.91  0.91  0.90  0.95  1.00
Lanes:       1.00  0.00  1.00  0.00  0.00  0.00  1.00  0.75  0.25  1.00  1.00  0.00
Final Sat.:  1736     0  1554     0     0     0  1900  1286   437  1718  1809     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06  0.00  0.01  0.00  0.00  0.00  0.00  0.38  0.38  0.01  0.32  0.00
Crit Moves:  ****                                      ****        ****
Green/Cycle: 0.10  0.00  0.10  0.00  0.00  0.00  0.00  0.68  0.68  0.02  0.70  0.00
Volume/Cap:  0.56  0.00  0.14  0.00  0.00  0.00  0.00  0.56  0.56  0.55  0.45  0.00
Delay/Veh:   29.9   0.0  25.1   0.0   0.0   0.0   0.0   5.6   5.6  46.5   4.2   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:  29.9   0.0  25.1   0.0   0.0   0.0   0.0   5.6   5.6  46.5   4.2   0.0
HCM2kAvg:       3     0     0     0     0     0     0     7     7     1     5     0
********************************************************************************
```



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                    Level Of Service Computation Report
         2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Oregon/Tonquin
********************************************************************************
Average Delay (sec/veh):     11.5    Worst Case Level Of Service:     E[ 35.3]
********************************************************************************
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    1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0   135   124    79   473     0     0     0     0   275     0    90
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   135   124    79   473     0     0     0     0   275     0    90
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:    0   135   124    79   473     0     0     0     0   275     0    90
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:     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 Volume:     0   135   124    79   473     0     0     0     0   275     0    90
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Final Vol.:     0   135   124    79   473     0     0     0     0   275     0    90
Critical Gap Module:
Critical Gp:xxxxx  xxxx xxxxx    4.1  xxxx xxxxx xxxxx  xxxx xxxxx   6.4  xxxx   6.2
FollowUpTim:xxxxx  xxxx xxxxx    2.2  xxxx xxxxx xxxxx  xxxx xxxxx   3.5  xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx  xxxx xxxxx    259  xxxx xxxxx  xxxx  xxxx xxxxx   766  xxxx   135
Potent Cap.: xxxx  xxxx xxxxx   1300  xxxx xxxxx  xxxx  xxxx xxxxx   369  xxxx   911
Move Cap.:   xxxx  xxxx xxxxx   1300  xxxx xxxxx  xxxx  xxxx xxxxx   351  xxxx   911
Volume/Cap:  xxxx  xxxx  xxxx   0.06  xxxx  xxxx  xxxx  xxxx  xxxx  0.78  xxxx  0.10
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx  xxxx xxxxx    0.2  xxxx xxxxx xxxxx  xxxx xxxxx   6.4  xxxx   0.3
Stopped Del:xxxxx  xxxx xxxxx    7.9  xxxx xxxxx xxxxx  xxxx xxxxx  43.8  xxxx   9.4
LOS by Move:    *     *     *      A     *     *     *     *     *     E     *     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
SharedQueue:xxxxx  xxxx xxxxx    0.2  xxxx xxxxx xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx
Shrd StpDel:xxxxx  xxxx xxxxx    7.9  xxxx xxxxx xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx
Shared LOS:     *     *     *      A     *     *     *     *     *     *     *     *
ApproachDel:        xxxxxx            xxxxxx            xxxxxx             35.3
ApproachLOS:           *                 *                 *                 E
```

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Level Of Service Computation Report
FHWA Roundabout Method (Future Volume Alternative)

Intersection #14 Oregon/Murdock

Average Delay (sec/veh): 6.0 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:	Yield Sign			Yield Sign			Yield Sign			Yield Sign		
Lanes:	1			0			1			1		
Volume Module:												
Base Vol:	16	0	155	0	0	0	0	90	34	444	224	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:	16	0	155	0	0	0	0	90	34	444	224	0
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:	16	0	155	0	0	0	0	90	34	444	224	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:	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 Volume:	16	0	155	0	0	0	0	90	34	444	224	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	16	0	155	0	0	0	0	90	34	444	224	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	1.00	1.00	1.00	1.00	1.00
Final Vol.:	16	0	155	0	0	0	0	90	34	444	224	0
PCE Module:												
AutoPCE:	16	0	150	0	0	0	0	86	33	440	222	0
TruckPCE:	1	0	7	0	0	0	0	4	2	7	3	0
ComboPCE:	0	0	0	0	0	0	0	2	1	0	0	0
BicyclePCE:	0	0	0	0	0	0	0	0	0	0	0	0
AdjVolume:	16	0	157	0	0	0	0	92	35	446	225	0

Delay Module: >> Time Period: 0.25 hours <<

	North Bound	South Bound	East Bound	West Bound
CircVolume:	92	688	446	16
MaxVolume:	1150	xxxxxx	959	1191
PedVolume:	0	0	0	0
AdjMaxVol:	1150	xxxxxx	959	1191
ApproachVol:	174	xxxxxx	127	671
ApproachDel:	3.7	xxxxxx	4.3	6.8
Queue:	0.5	xxxx	0.5	3.7

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #15 Murdock/Willamette

Average Delay (sec/veh): 1.0 Worst Case Level Of Service: B[13.4]

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:	8	162	4	15	342	12	14	4	4	3	2	5
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:	8	162	4	15	342	12	14	4	4	3	2	5
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:	8	162	4	15	342	12	14	4	4	3	2	5
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:	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 Volume:	8	162	4	15	342	12	14	4	4	3	2	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	8	162	4	15	342	12	14	4	4	3	2	5
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.2	6.6	6.3	7.3	6.7	6.4
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.6	4.1	3.4	3.7	4.2	3.5
Capacity Module:												
Cnflict Vol:	354	xxxx	xxxxx	166	xxxx	xxxxx	562	560	348	562	564	164
Potent Cap.:	1205	xxxx	xxxxx	1418	xxxx	xxxxx	430	430	684	416	415	843
Move Cap.:	1205	xxxx	xxxxx	1418	xxxx	xxxxx	421	423	684	405	408	843
Volume/Cap:	0.01	xxxx	xxxx	0.01	xxxx	xxxx	0.03	0.01	0.01	0.01	0.00	0.01
Level Of Service Module:												
Queue:	0.0	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	8.0	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
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	453	xxxxx	xxxx	548	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.2	xxxxx	xxxxx	0.1	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	13.4	xxxxx	xxxxx	11.7	xxxxx
Shared LOS:	*	*	*	*	*	*	*	B	*	*	B	*
ApproachDel:		xxxxxx			xxxxxx			13.4			11.7	
ApproachLOS:		*			*			B			B	

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #16 Sunset/Murdock

Cycle (sec):	100	Critical Vol./Cap. (X):	0.393
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	10.2
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		
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			1 0 0 1 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	201	57	4	19	46	240	93	12	133	1	8	11
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:	201	57	4	19	46	240	93	12	133	1	8	11
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:	201	57	4	19	46	240	93	12	133	1	8	11
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:	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 Volume:	201	57	4	19	46	240	93	12	133	1	8	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	201	57	4	19	46	240	93	12	133	1	8	11
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.:	201	57	4	19	46	240	93	12	133	1	8	11
Saturation Flow Module:												
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:	0.77	0.22	0.01	0.06	0.15	0.79	1.00	0.08	0.92	0.05	0.40	0.55
Final Sat.:	525	149	10	48	117	611	540	54	596	30	238	327
Capacity Analysis Module:												
Vol/Sat:	0.38	0.38	0.38	0.39	0.39	0.39	0.17	0.22	0.22	0.03	0.03	0.03
Crit Moves:		****		****					****		****	
Delay/Veh:	11.0	11.0	11.0	10.2	10.2	10.2	10.3	9.2	9.2	8.5	8.5	8.5
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
AdjDel/Veh:	11.0	11.0	11.0	10.2	10.2	10.2	10.3	9.2	9.2	8.5	8.5	8.5
LOS by Move:	B	B	B	B	B	B	B	A	A	A	A	A
ApproachDel:		11.0			10.2			9.6			8.5	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		11.0			10.2			9.6			8.5	
LOS by Appr:		B			B			A			A	

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #17 Sunset/Sherwood

Cycle (sec):	100	Critical Vol./Cap. (X):	0.832
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	23.0
Optimal Cycle:	0	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			Stop Sign			Stop Sign		
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:	36	104	27	65	187	170	78	224	37	51	343	74
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:	36	104	27	65	187	170	78	224	37	51	343	74
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:	36	104	27	65	187	170	78	224	37	51	348	74
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:	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 Volume:	36	104	27	65	187	170	78	224	37	51	348	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	36	104	27	65	187	170	78	224	37	51	348	74
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.:	36	104	27	65	187	170	78	224	37	51	348	74
Saturation Flow Module:												
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:	1.00	0.79	0.21	1.00	0.52	0.48	1.00	0.86	0.14	1.00	0.82	0.18
Final Sat.:	395	338	88	442	261	237	437	408	67	460	418	89
Capacity Analysis Module:												
Vol/Sat:	0.09	0.31	0.31	0.15	0.72	0.72	0.18	0.55	0.55	0.11	0.83	0.83
Crit Moves:		****				****		****			****	
Delay/Veh:	11.9	13.5	13.5	11.8	24.2	24.2	12.2	17.8	17.8	11.2	34.0	34.0
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:	11.9	13.5	13.5	11.8	24.2	24.2	12.2	17.8	17.8	11.2	34.0	34.0
LOS by Move:	B	B	B	B	C	C	B	C	C	B	D	D
ApproachDel:		13.2			22.3			16.6			31.6	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		13.2			22.3			16.6			31.6	
LOS by Appr:		B			C			C			D	

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #18 Edy/Elwert

Cycle (sec): 100 Critical Vol./Cap. (X): 0.566
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 11.4
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	
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 0 1! 0 0			0 0 1! 0 0	
Volume Module:												
Base Vol:	9	122	26	72	344	15	7	45	10	28	61	41
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:	9	122	26	72	344	15	7	45	10	28	61	41
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:	9	122	26	72	344	15	7	45	10	28	61	41
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:	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 Volume:	9	122	26	72	344	15	7	45	10	28	61	41
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	9	122	26	72	344	15	7	45	10	28	61	41
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.:	9	122	26	72	344	15	7	45	10	28	61	41
Saturation Flow Module:												
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:	0.06	0.78	0.16	0.17	0.80	0.03	0.11	0.73	0.16	0.21	0.47	0.32
Final Sat.:	41	551	117	127	608	27	67	431	96	136	297	200
Capacity Analysis Module:												
Vol/Sat:	0.22	0.22	0.22	0.57	0.57	0.57	0.10	0.10	0.10	0.21	0.21	0.21
Crit Moves:		****				****		****			****	
Delay/Veh:	9.1	9.1	9.1	13.2	13.2	13.2	9.0	9.0	9.0	9.4	9.4	9.4
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:	9.1	9.1	9.1	13.2	13.2	13.2	9.0	9.0	9.0	9.4	9.4	9.4
LOS by Move:	A	A	A	B	B	B	A	A	A	A	A	A
ApproachDel:		9.1			13.2			9.0			9.4	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.1			13.2			9.0			9.4	
LOS by Appr:		A			B			A			A	

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #19 Edy/Borchers

Average Delay (sec/veh): 7.1 Worst Case Level Of Service: C(19.9)

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 1			1 0 1 0 0			0 0 0 1 0	
Volume Module:												
Base Vol:	0	0	0	266	0	65	22	217	0	0	256	132
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	266	0	65	22	217	0	0	256	132
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:	0	0	0	266	0	65	22	217	0	0	256	132
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:	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 Volume:	0	0	0	266	0	65	22	217	0	0	256	132
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	266	0	65	22	217	0	0	256	132
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	583	xxxx	323	388	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	476	xxxx	720	1170	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	469	xxxx	720	1170	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.57	xxxx	0.09	0.02	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	3.5	xxxx	0.3	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	22.2	xxxx	10.5	8.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	C	*	B	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
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		xxxxxx			19.9			xxxxxx			xxxxxx	
ApproachLOS:		*			C			*			*	

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #20 Sherwood/Langer

Cycle (sec): 60 Critical Vol./Cap. (X): 0.611
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 39.0
Optimal Cycle: 57 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:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	4	4	4	4	4	4	4	25	4	4	20	4
Lanes:	1 0 0 1 0			1 0 0 1 0			1 0 0 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	72	40	47	223	72	259	139	320	23	14	189	313
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:	72	40	47	223	72	259	139	320	23	14	189	313
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:	72	40	47	223	72	259	139	320	23	14	189	313
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:	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 Volume:	72	40	47	223	72	259	139	320	23	14	189	313
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	72	40	47	223	72	259	139	320	23	14	189	313
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	40	47	223	72	259	139	320	23	14	189	313
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.93	0.90	0.90	0.92	0.86	0.86	0.93	0.97	0.97	0.90	0.81	0.81
Lanes:	1.00	0.46	0.54	1.00	0.22	0.78	1.00	0.93	0.07	1.00	1.00	1.00
Final Sat.:	1769	787	924	1753	354	1275	1769	1720	124	1702	1542	1542
Capacity Analysis Module:												
Vol/Sat:	0.04	0.05	0.05	0.13	0.20	0.20	0.08	0.19	0.19	0.01	0.12	0.20
Crit Moves:		****				****		****		****		
Green/Cycle:	0.07	0.07	0.07	0.18	0.18	0.18	0.15	0.42	0.42	0.07	0.33	0.33
Volume/Cap:	0.61	0.76	0.76	0.69	1.11	1.11	0.52	0.45	0.45	0.12	0.37	0.61
Delay/Veh:	36.3	53.2	53.2	29.4	109	108.9	25.4	13.0	13.0	26.8	15.4	16.1
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:	36.3	53.2	53.2	29.4	109	108.9	25.4	13.0	13.0	26.8	15.4	16.1
HCM2kAvg:	3	3	3	6	14	14	3	5	5	0	3	6

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #21 Sherwood/Century

Average Delay (sec/veh): 12.2 Worst Case Level Of Service: F[77.4]

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 0 1 0			1 0 0 1 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	18	395	64	70	491	43	25	40	52	62	22	60
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:	18	395	64	70	491	43	25	40	52	62	22	60
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:	18	395	64	70	491	43	25	40	52	62	22	60
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:	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 Volume:	18	395	64	70	491	43	25	40	52	62	22	60
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	18	395	64	70	491	43	25	40	52	62	22	60
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	545	xxxx	xxxxx	472	xxxx	xxxxx	1177	1172	560	1210	1161	449
Potent Cap.:	1029	xxxx	xxxxx	1090	xxxx	xxxxx	169	193	530	160	196	612
Move Cap.:	1020	xxxx	xxxxx	1078	xxxx	xxxxx	127	174	509	107	177	601
Volume/Cap:	0.02	xxxx	xxxx	0.06	xxxx	xxxx	0.20	0.23	0.10	0.58	0.12	0.10
Level Of Service Module:												
Queue:	0.1	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	8.6	xxxx	xxxxx	8.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
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	221	xxxxx	xxxx	179	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	2.8	xxxxx	xxxxx	5.5	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	38.2	xxxxx	xxxxx	77.4	xxxxx
Shared LOS:	*	*	*	*	*	*	*	E	*	*	F	*
ApproachDel:		xxxxxx			xxxxxx			38.2			77.4	
ApproachLOS:		*			*			E			F	

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-------------------------------------------------------------------------------
                              Sherwood TSP
                          Future (2020) PM Peak
                                 S31000
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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #22 Sherwood-Pine/3rd
*******************************************************************************
Average Delay (sec/veh):       3.3     Worst Case Level Of Service:     D[ 25.6]
*******************************************************************************
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  0  0  0    0  0  0  1  0    0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     105    0   27     0    0    0     0  421  162    45  383    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:  105    0   27     0    0    0     0  421  162    45  383    0
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:  105    0   27     0    0    0     0  421  162    45  383    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:     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 Volume:   105    0   27     0    0    0     0  421  162    45  383    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Final Vol.:   105    0   27     0    0    0     0  421  162    45  383    0
Critical Gap Module:
Critical Gp:  6.4 xxxx  6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx  3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  975 xxxx  502  xxxx xxxx xxxxx  xxxx xxxx xxxxx   583 xxxx xxxxx
Potent Cap.:  281 xxxx  573  xxxx xxxx xxxxx  xxxx xxxx xxxxx   986 xxxx xxxxx
Move Cap.:    271 xxxx  573  xxxx xxxx xxxxx  xxxx xxxx xxxxx   986 xxxx xxxxx
Volume/Cap:  0.39 xxxx 0.05  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.05 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.8 xxxx xxxxx
LOS by Move:    *    *    *     *    *    *     *    *    *     A    *    *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  304 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  2.1 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Shrd StpDel:xxxxx 25.6 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.8 xxxx xxxxx
Shared LOS:     *    D    *     *    *    *     *    *    *     A    *    *
ApproachDel:        25.6            xxxxxx            xxxxxx            xxxxxx
ApproachLOS:          D                 *                 *                 *
```



```
-------------------------------------------------------------------------------
                              Sherwood TSP
                          Future (2020) PM Peak
                                 S31000
-------------------------------------------------------------------------------

                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #23 Pine/Oregon
*******************************************************************************
Average Delay (sec/veh):       8.9     Worst Case Level Of Service:     D[ 25.5]
*******************************************************************************
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    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0   44    0    74   63  122    92  216    0     0  203  100
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   44    0    74   63  122    92  216    0     0  203  100
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:    0   44    0    74   63  122    92  216    0     0  203  100
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:     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 Volume:     0   44    0    74   63  122    92  216    0     0  203  100
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Final Vol.:     0   44    0    74   63  122    92  216    0     0  203  100
Critical Gap Module:
Critical Gp:xxxxx  6.5 xxxxx   7.2  6.6  6.3   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx  4.0 xxxxx   3.5  4.0  3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx  730 xxxxx   694  680  270   315 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx  352 xxxxx   353  369  761  1240 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx  317 xxxxx   292  333  751  1227 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx 0.14  xxxx  0.25 0.19 0.16  0.07 xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx  0.5 xxxxx xxxxx xxxx xxxxx   0.2 xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx 18.2 xxxxx xxxxx xxxx xxxxx   8.2 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    C    *     *    *    *     A    *    *     *    *    *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  428 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx  3.9 xxxxx   0.2 xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 25.5 xxxxx   8.2 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *    *     *    D    *     A    *    *     *    *    *
ApproachDel:        18.2              25.5            xxxxxx            xxxxxx
ApproachLOS:          C                 D                 *                 *
```

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #24 Washington/Railroad

Cycle (sec):	100	Critical Vol./Cap. (X):	0.188
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	7.8
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	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		0 1 0 0 0			C 0 11 0 0			0 0 0 1 0			0 0 0 1 0	
Volume Module:												
Base Vol:	8	89	0	26	124	12	0	8	26	0	2	23
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:	8	89	0	26	124	12	0	8	26	0	2	23
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:	8	89	0	26	124	12	0	8	26	0	2	23
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:	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 Volume:	8	89	0	26	124	12	0	8	26	0	2	23
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	89	0	26	124	12	0	8	26	0	2	23
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.:	8	89	0	26	124	12	0	8	26	0	2	23
Saturation Flow Module:												
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:	0.08	0.92	0.00	0.15	0.77	0.07	0.00	0.24	0.76	0.00	0.08	0.92
Final Sat.:	68	757	0	138	659	64	0	198	643	0	69	788
Capacity Analysis Module:												
Vol/Sat:	0.12	0.12	xxxx	0.19	0.19	0.19	xxxx	0.04	0.04	xxxx	0.03	0.03
Crit Moves:	****			****					****		****	
Delay/Veh:	7.8	7.8	0.0	8.1	8.1	8.1	0.0	7.2	7.2	0.0	7.1	7.1
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:	7.8	7.8	0.0	8.1	8.1	8.1	0.0	7.2	7.2	0.0	7.1	7.1
LOS by Move:	A	A	*	A	A	A	*	A	A	*	A	A
ApproachDel:		7.8			8.1			7.2			7.1	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		7.8			8.1			7.2			7.1	
LOS by Appr:		A			A			A			A	

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #25 Washington/3rd

Cycle (sec):	100	Critical Vol./Cap. (X):	0.120
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	7.5
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	
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 0 1! 0 0			0 0 1! 0 0	
Volume Module:												
Base Vol:	16	7	1	15	29	51	46	37	18	3	15	4
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:	16	7	1	15	29	51	46	37	18	3	15	4
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:	16	7	1	15	29	51	46	37	18	3	15	4
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:	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 Volume:	16	7	1	15	29	51	46	37	18	3	15	4
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	16	7	1	15	29	51	46	37	18	3	15	4
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.:	16	7	1	15	29	51	46	37	18	3	15	4
Saturation Flow Module:												
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:	0.67	0.29	0.04	0.16	0.30	0.54	0.45	0.37	0.18	0.14	0.68	0.18
Final Sat.:	530	232	33	141	272	478	382	308	150	113	563	150
Capacity Analysis Module:												
Vol/Sat:	0.03	0.03	0.03	0.11	0.11	0.11	0.12	0.12	0.12	0.03	0.03	0.03
Crit Moves:	****			****			****			****		
Delay/Veh:	7.5	7.5	7.5	7.4	7.4	7.4	7.7	7.7	7.7	7.3	7.3	7.3
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:	7.5	7.5	7.5	7.4	7.4	7.4	7.7	7.7	7.7	7.3	7.3	7.3
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:		7.5			7.4			7.7			7.3	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		7.5			7.4			7.7			7.3	
LOS by Appr:		A			A			A			A	

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #26 Sherwood/Railroad

Cycle (sec):	100	Critical Vol./Cap. (X):	0.448
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	10.7
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		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	1 0	0 0	1!	0 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module:												
Base Vol:	0	11	10	158	9	9	30	281	5	6	152	97
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	11	10	158	9	9	30	281	5	6	152	97
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:	0	11	10	158	9	9	30	281	5	6	152	97
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:	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 Volume:	0	11	10	158	9	9	30	281	5	6	152	97
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	11	10	158	9	9	30	281	5	6	152	97
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.:	0	11	10	158	9	9	30	281	5	6	152	97
Saturation Flow Module:												
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:	0.00	0.52	0.48	0.90	0.05	0.05	0.09	0.89	0.02	0.02	0.60	0.38
Final Sat.:	0	317	289	557	32	32	67	627	11	18	447	285
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.03	0.03	0.28	0.28	0.28	0.45	0.45	0.45	0.34	0.34	0.34
Crit Moves:			****	****				****			****	
Delay/Veh:	0.0	8.4	8.4	10.3	10.3	10.3	11.7	11.7	11.7	9.8	9.8	9.8
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
AdjDel/Veh:	0.0	8.4	8.4	10.3	10.3	10.3	11.7	11.7	11.7	9.8	9.8	9.8
LOS by Move:	*	A	A	B	B	B	B	B	B	A	A	A
ApproachDel:		8.4			10.3			11.7			9.8	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		8.4			10.3			11.7			9.8	
LOS by Appr:		A			B			B			A	

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #27 Cipcle/Herman

Cycle (sec):	100	Critical Vol./Cap. (X):	0.284
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	9.2
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		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	1!	0 0	0 0	0	0 0	0 0	0	1 0	0 1	0	0 0
Volume Module:												
Base Vol:	150	0	52	0	0	0	0	47	96	111	99	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:	150	0	52	0	0	0	0	47	96	111	99	0
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:	150	0	52	0	0	0	0	47	96	111	99	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:	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 Volume:	150	0	52	0	0	0	0	47	96	111	99	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	150	0	52	0	0	0	0	47	96	111	99	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	1.00	1.00	1.00	1.00	1.00
Final Vol.:	150	0	52	0	0	0	0	47	96	111	99	0
Saturation Flow Module:												
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:	0.74	0.00	0.26	0.00	0.00	0.00	0.00	0.33	0.67	0.53	0.47	0.00
Final Sat.:	536	0	186	0	0	0	0	262	536	390	348	0
Capacity Analysis Module:												
Vol/Sat:	0.28	xxxx	0.28	xxxx	xxxx	xxxx	xxxx	0.18	0.18	0.28	0.28	xxxx
Crit Moves:	****							****			****	
Delay/Veh:	9.5	0.0	9.5	0.0	0.0	0.0	0.0	8.2	8.2	9.5	9.5	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:	9.5	0.0	9.5	0.0	0.0	0.0	0.0	8.2	8.2	9.5	9.5	0.0
LOS by Move:	A	*	A	*	*	*	*	A	A	A	A	*
ApproachDel:		9.5			xxxxxx			8.2			9.5	
Delay Adj:		1.00			xxxxx			1.00			1.00	
ApprAdjDel:		9.5			xxxxxx			8.2			9.5	
LOS by Appr:		A			*			A			A	

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Level Of Service Computation Report
FHWA Roundabout Method (Future Volume Alternative)

Intersection #28 Meinecke/Dewey

Average Delay (sec/veh): 3.7 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:	Yield Sign			Yield Sign			Yield Sign			Yield Sign		
Lanes:	0			1			1			1		
Volume Module:												
Base Vol:	0	0	0	127	0	127	52	36	0	0	52	110
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	127	0	127	52	36	0	0	52	110
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:	0	0	0	127	0	127	52	36	0	0	52	110
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:	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 Volume:	0	0	0	127	0	127	52	36	0	0	52	110
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	127	0	127	52	36	0	0	52	110
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.:	0	0	0	127	0	127	52	36	0	0	52	110
PCE Module:												
AutoPCE:	0	0	0	126	0	126	52	36	0	0	51	108
TruckPCE:	0	0	0	2	0	2	0	0	0	0	2	3
ComboPCE:	0	0	0	0	0	0	0	0	0	0	0	0
BicyclePCE:	0	0	0	0	0	0	0	0	0	0	0	0
AdjVolume:	0	0	0	128	0	128	52	36	0	0	53	111

Delay Module: >> Time Period: 0.25 hours <<

	North Bound	South Bound	East Bound	West Bound
CircVolume:	216	53	128	52
MaxVolume:	xxxxxx	1172	1131	1172
PedVolume:	0	0	0	0
AdjMaxVol:	xxxxxx	1172	1131	1172
ApproachVol:	xxxxxx	255	88	164
ApproachDel:	xxxxxx	3.9	3.5	3.6
Queue:	xxxx	0.8	0.3	0.5

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #29 Brookman/Ladd Hill

Average Delay (sec/veh): 2.6 Worst Case Level Of Service: B[10.2]

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:	37	82	0	0	98	74	38	0	26	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:	37	82	0	0	98	74	38	0	26	0	0	0
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:	37	82	0	0	98	74	38	0	26	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:	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 Volume:	37	82	0	0	98	74	38	0	26	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	37	82	0	0	98	74	38	0	26	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	6.3	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.6	xxxx	3.4	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	172	xxxx	xxxxx	xxxx	xxxx	xxxxx	291	xxxx	135	xxxx	xxxx	xxxxx
Potent Cap.:	1411	xxxx	xxxxx	xxxx	xxxx	xxxxx	689	xxxx	901	xxxx	xxxx	xxxxx
Move Cap.:	1411	xxxx	xxxxx	xxxx	xxxx	xxxxx	675	xxxx	901	xxxx	xxxx	xxxxx
Volume/Cap:	0.03	xxxx	xxxx	xxxx	xxxx	xxxx	0.06	xxxx	0.03	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	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	752	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.3	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	10.2	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	B	*	*	*	*
ApproachDel:		xxxxxx			xxxxxx			10.2			xxxxxx	
ApproachLOS:		*			*			B			*	

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----------------------------------------------------------------------------
                              Sherwood TSP
                          Future (2020) PM Peak
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                    Level Of Service Computation Report
        2000 HCM Unsignalized Method (Future Volume Alternative)
****************************************************************************
Intersection #30 Sunset/Pine
****************************************************************************
Average Delay (sec/veh):      2.4    Worst Case Level Of Service:    C[ 21.4]
****************************************************************************
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  1  0  0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       5    2    0     79    1   11     13  286    8      1  465   55
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:    5    2    0     79    1   11     13  286    8      1  465   55
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:    5    2    0     79    1   11     13  286    8      1  465   55
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:     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 Volume:     5    2    0     79    1   11     13  286    8      1  465   55
Reduct Vol:     0    0    0      0    0    0      0    0    0      0    0    0
Final Vol.:     5    2    0     79    1   11     13  286    8      1  465   55
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx   7.1  6.5  6.2    4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx   3.5  4.0  3.3    2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  831  840 xxxxx   814  816  509    522 xxxx xxxxx   294 xxxx xxxxx
Potent Cap.:  291  304 xxxxx   297  311  565   1050 xxxx xxxxx  1273 xxxx xxxxx
Move Cap.:    279  299 xxxxx   292  307  557   1048 xxxx xxxxx  1273 xxxx xxxxx
Volume/Cap:  0.02 0.01  xxxx  0.27 0.00 0.02   0.01 xxxx  xxxx  0.00 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:       xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx    8.5 xxxx xxxxx   7.8 xxxx xxxxx
LOS by Move:    *    *    *      *    *    *      A    *    *      A    *    *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.:  284 xxxx xxxxx  xxxx  310 xxxxx   xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:  0.1 xxxx xxxxx xxxxx  1.2 xxxxx  xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel: 18.0 xxxx xxxxx xxxxx 21.4 xxxxx  xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     C    *    *      *    C    *      *    *    *      *    *    *
ApproachDel:       18.0             21.4            xxxxxx           xxxxxx
ApproachLOS:         C                C                *                *
```



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----------------------------------------------------------------------------
                              Sherwood TSP
                          Future (2020) PM Peak
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                    Level Of Service Computation Report
        2000 HCM 4-Way Stop Method (Future Volume Alternative)
****************************************************************************
Intersection #31 Sunset/Pinehurst
****************************************************************************
Cycle (sec):          100            Critical Vol./Cap. (X):         0.635
Loss Time (sec):        0 (Y+R =  4 sec) Average Delay (sec/veh):     13.5
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
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    1  0  0  1  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      25   15   37     62   18   15     56  280   41     76  313  115
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   15   37     62   18   15     56  280   41     76  313  115
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:   25   15   37     62   18   15     56  280   41     76  313  115
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:     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 Volume:    25   15   37     62   18   15     56  280   41     76  313  115
Reduct Vol:     0    0    0      0    0    0      0    0    0      0    0    0
Reduced Vol:   25   15   37     62   18   15     56  280   41     76  313  115
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.:    25   15   37     62   18   15     56  280   41     76  313  115
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
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:       0.32 0.19 0.49   0.65 0.19 0.16   1.00 0.87 0.13   1.00 0.73 0.27
Final Sat.:   176  106  261    349  101   84    577  560   82    593  493  181
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.14 0.14 0.14   0.18 0.18 0.18   0.10 0.50 0.50   0.13 0.63 0.63
Crit Moves:       ****             ****             ****                  ****
Delay/Veh:    9.8  9.8  9.8   10.2 10.2 10.2    9.4 13.3 13.3    9.5 16.3 16.3
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:   9.8  9.8  9.8   10.2 10.2 10.2    9.4 13.3 13.3    9.5 16.3 16.3
LOS by Move:    A    A    A      B    B    B      A    B    B      A    C    C
ApproachDel:        9.8             10.2             12.7             15.3
Delay Adj:         1.00             1.00             1.00             1.00
ApprAdjDel:         9.8             10.2             12.7             15.3
LOS by Appr:         A                B                B                C
****************************************************************************
```

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #32 Sunset/Woodhaven

Average Delay (sec/veh): 5.6 Worst Case Level Of Service: D[30.9]

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 1 0 1			1 0 0 1 0		
Volume Module:												
Base Vol:	11	4	5	49	4	98	188	408	26	3	316	52
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:	11	4	5	49	4	98	188	408	26	3	316	52
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:	11	4	5	49	4	98	188	408	26	3	316	52
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:	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 Volume:	11	4	5	49	4	98	188	408	26	3	316	52
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	11	4	5	49	4	98	188	408	26	3	316	52
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1197	1168	413	1155	1168	356	373	xxxx	xxxxx	439	xxxx	xxxxx
Potent Cap.:	162	193	637	175	194	690	1197	xxxx	xxxxx	1121	xxxx	xxxxx
Move Cap.:	118	160	634	149	162	682	1192	xxxx	xxxxx	1116	xxxx	xxxxx
Volume/Cap:	0.09	0.02	0.01	0.33	0.02	0.14	0.16	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.6	xxxx	xxxxx	0.0	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.6	xxxx	xxxxx	8.2	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	159	xxxxx	xxxx	303	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.4	xxxxx	xxxxx	2.6	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	30.9	xxxxx	xxxxx	28.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	D	*	*	D	*	*	*	*	*	*	*
ApproachDel:		30.9			28.1			xxxxxx			xxxxxx	
ApproachLOS:		D			D			*			*	

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #33 Elwert/Swanstrom

Average Delay (sec/veh): 0.6 Worst Case Level Of Service: B[10.8]

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			0 1 0 0 0			0 0 0 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	0	144	13	13	371	0	0	0	0	11	0	11
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	144	13	13	371	0	0	0	0	11	0	11
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:	0	144	13	13	371	0	0	0	0	11	0	11
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:	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 Volume:	0	144	13	13	371	0	0	0	0	11	0	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	144	13	13	371	0	0	0	0	11	0	11
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	157	xxxx	xxxxx	xxxx	xxxx	xxxxx	547	xxxx	151
Potent Cap.:	xxxx	xxxx	xxxxx	1429	xxxx	xxxxx	xxxx	xxxx	xxxxx	501	xxxx	901
Move Cap.:	xxxx	xxxx	xxxxx	1429	xxxx	xxxxx	xxxx	xxxx	xxxxx	498	xxxx	901
Volume/Cap:	xxxx	xxxx	xxxx	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	0.02	xxxx	0.01
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	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	641	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	10.8	xxxxx
Shared LOS:	*	*	*	A	*	*	*	*	*	*	B	*
ApproachDel:		xxxxxx			xxxxxx			xxxxxx			10.8	
ApproachLOS:		*			*			*			B	

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-----------------------------------------------------------------------------
                              Sherwood TSP
                         Future (2020) PM Peak
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-----------------------------------------------------------------------------
                  Level Of Service Computation Report
       2000 HCM Unsignalized Method (Future Volume Alternative)
*****************************************************************************
Intersection #34 Elwert/Kruger
*****************************************************************************
Average Delay (sec/veh):        8.0   Worst Case Level Of Service:    B[ 12.5]
*****************************************************************************
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  1  0   0  1  0  0  0   0  0  0  0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0    5    23   359    4     0     0    0     0    21    0   172
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    5    23   359    4     0     0    0     0    21    0   172
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:   0    5    23   359    4     0     0    0     0    21    0   172
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:     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 Volume:    0    5    23   359    4     0     0    0     0    21    0   172
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    0    5    23   359    4     0     0    0     0    21    0   172
Critical Gap Module:
Critical Gp:xxxxx  6.5   6.2   7.1  6.5 xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:xxxxx  4.0   3.3   3.5  4.0 xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx  214     0   131  128 xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Potent Cap.: xxxx  685     0   847  766 xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Move Cap.:   xxxx  685     0   842  766 xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Volume/Cap:  xxxx 0.01  0.00  0.43 0.01  xxxx  xxxx xxxx  xxxx  0.00 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx  3838   841 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx   0.0   2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx   5.9  12.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     A     B    *     *     *    *     *     *    *     *
ApproachDel:        5.9            12.5            xxxxxx          xxxxxx
ApproachLOS:         A               B               *               *
```



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-----------------------------------------------------------------------------
                              Sherwood TSP
                         Future (2020) PM Peak
                                S31000
-----------------------------------------------------------------------------
                  Level Of Service Computation Report
       2000 HCM Unsignalized Method (Future Volume Alternative)
*****************************************************************************
Intersection #35 Oregon/Lincoln
*****************************************************************************
Average Delay (sec/veh):        0.9   Worst Case Level Of Service:    B[ 11.4]
*****************************************************************************
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  0  0  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     14    0     6     0    0     0     0  179    26    26  228     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:  14    0     6     0    0     0     0  179    26    26  228     0
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:  14    0     6     0    0     0     0  179    26    26  228     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:     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 Volume:   14    0     6     0    0     0     0  179    26    26  228     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   14    0     6     0    0     0     0  179    26    26  228     0
Critical Gap Module:
Critical Gp:  6.5 xxxx   6.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.6 xxxx   3.4 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  485 xxxx   193  xxxx xxxx xxxxx  xxxx xxxx xxxxx   206 xxxx xxxxx
Potent Cap.:  532 xxxx   836  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1365 xxxx xxxxx
Move Cap.:    519 xxxx   835  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1364 xxxx xxxxx
Volume/Cap:  0.03 xxxx  0.01  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.02 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.7 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  585 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.1 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Shrd StpDel:xxxxx 11.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.7 xxxx xxxxx
Shared LOS:    *    B     *     *    *     *     *    *     *     A    *     *
ApproachDel:       11.4            xxxxxx          xxxxxx          xxxxxx
ApproachLOS:         B               *               *               *
```

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Scenario Report

Scenario:	2020 PM Peak
Command:	2020 PM Peak
Volume:	Default Volume
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Paths
Routes:	Default Routes
Configuration:	Default Configuration

Sherwood TSP
Future (2020) Build (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 ORE 99W/Home Depot	B	17.9	0.759	B	17.9	0.759	+ 0.000 D/V
# 2 ORE 99W/Tualatin-Sherwood Rd	D	43.9	0.864	D	43.9	0.864	+ 0.000 D/V
# 3 ORE 99W/Sherwood Blvd	D	38.1	0.801	D	38.1	0.801	+ 0.000 D/V
# 4 ORE 99W/Meinecke	B	16.4	0.717	B	16.4	0.717	+ 0.000 D/V
# 5 ORE 99W/Sunset	C	31.3	0.849	C	31.3	0.849	+ 0.000 D/V
# 6 ORE 99W/Brookman	F	102.9	0.000	F	102.9	0.000	+ 0.000 D/V
# 7 Tualatin-Sherwood/Cipole	B	15.7	0.562	B	15.7	0.562	+ 0.000 D/V
# 8 Tualatin-Sherwood/Oregon	C	22.1	0.753	C	22.1	0.753	+ 0.000 D/V
# 9 Tualatin-Sherwood/Gerda	F	64.2	0.000	F	64.2	0.000	+ 0.000 D/V
# 10 Tualatin-Sherwood/Langer	B	13.3	0.000	B	13.3	0.000	+ 0.000 D/V
# 11 Tualatin-Sherwood/Regal Cinema	B	19.3	0.518	B	19.3	0.518	+ 0.000 D/V
# 12 Roy Rogers/Borchers	A	7.6	0.559	A	7.6	0.559	+ 0.000 D/V
# 13 Oregon/Tonquin	E	35.3	0.000	E	35.3	0.000	+ 0.000 D/V
# 14 Oregon/Murdock	A	6.0	0.000	A	6.0	0.000	+ 0.000 V/C
# 15 Murdock/Willamette	B	13.4	0.000	B	13.4	0.000	+ 0.000 D/V
# 16 Sunset/Murdock	B	10.2	0.393	B	10.2	0.393	+ 0.000 V/C
# 17 Sunset/Sherwood	C	23.0	0.832	C	23.0	0.832	+ 0.000 V/C
# 18 Edy/Elwert	B	11.4	0.566	B	11.4	0.566	+ 0.000 V/C
# 19 Edy/Borchers	B	13.7	0.495	B	13.7	0.495	+ 0.000 D/V
# 20 Sherwood/Langer	C	18.0	0.000	C	18.0	0.000	+ 0.000 D/V
# 21 Sherwood/Century	B	18.7	0.507	B	18.7	0.507	+ 0.000 D/V
# 22 Sherwood-Pine/3rd	D	25.6	0.000	D	25.6	0.000	+ 0.000 D/V
# 23 Pine/Oregon	D	25.5	0.000	D	25.5	0.000	+ 0.000 D/V

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 24 Washington/Railroad	A	7.8	0.188	A	7.8	0.188	+ 0.000 V/C
# 25 Washington/3rd	A	7.5	0.120	A	7.5	0.120	+ 0.000 V/C
# 26 Sherwood/Railroad	B	10.7	0.448	B	10.7	0.448	+ 0.000 V/C
# 27 Cipole/Herman	A	9.2	0.284	A	9.2	0.284	+ 0.000 V/C
# 28 Meinecke/Dewey	A	3.7	0.000	A	3.7	0.000	+ 0.000 V/C
# 29 Brookman/Ladd Hill	B	10.2	0.000	B	10.2	0.000	+ 0.000 D/V
# 30 Sunset/Pine	C	21.4	0.000	C	21.4	0.000	+ 0.000 D/V
# 31 Sunset/Pinehurst	B	13.5	0.635	B	13.5	0.635	+ 0.000 V/C
# 32 Sunset/Woodhaven	D	30.9	0.000	D	30.9	0.000	+ 0.000 D/V
# 33 Elwert/Swanstrom	B	10.8	0.000	B	10.8	0.000	+ 0.000 D/V
# 34 Elwert/Kruger	B	10.6	0.000	B	10.6	0.000	+ 0.000 D/V
# 35 Oregon/Lincoln	B	11.4	0.000	B	11.4	0.000	+ 0.000 D/V

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 ORE 99W/Home Depot

Cycle (sec):	120	Critical Vol./Cap. (X):	0.759
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	17.9
Optimal Cycle:	72	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	2 0	1	1 0	1 1	0	0 1	0 0	1	0 1	0 0	1
Volume Module:												
Base Vol:	23	833	104	99	1930	12	60	1	31	150	0	91
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:	23	833	104	99	1930	12	60	1	31	150	0	91
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:	23	833	104	99	1930	12	60	1	31	150	0	91
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:	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 Volume:	23	833	104	99	1930	12	60	1	31	150	0	91
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	833	104	99	1930	12	60	1	31	150	0	91
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.:	23	833	104	99	1930	12	60	1	31	150	0	91
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.80	0.93	0.93	0.93	0.48	0.48	0.85	0.66	1.00	0.83
Lanes:	1.00	2.00	1.00	1.00	1.99	0.01	0.98	0.02	1.00	1.00	0.00	1.00
Final Sat.:	1702	3404	1523	1769	3512	22	888	15	1615	1248	0	1583
Capacity Analysis Module:												
Vol/Sat:	0.01	0.24	0.07	0.06	0.55	0.55	0.07	0.07	0.02	0.12	0.00	0.06
Crit Moves:	****				****					****		
Green/Cycle:	0.02	0.60	0.60	0.14	0.72	0.72	0.16	0.16	0.16	0.16	0.00	0.16
Volume/Cap:	0.76	0.41	0.11	0.41	0.76	0.76	0.43	0.43	0.12	0.76	0.00	0.36
Delay/Veh:	129.3	12.6	10.2	48.3	11.5	11.5	47.6	47.6	43.5	63.9	0.0	46.0
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:	129.3	12.6	10.2	48.3	11.5	11.5	47.6	47.6	43.5	63.9	0.0	46.0
HCM2kAvg:	2	8	2	4	23	27	5	4	1	10	0	3

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #2 ORE 99W/Tualatin-Sherwood Rd

Cycle (sec): 120　Critical Vol./Cap. (X): 0.864
Loss Time (sec): 16 (Y+R = 4 sec)　Average Delay (sec/veh): 43.9
Optimal Cycle: 113　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			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 3 0 1			1 0 2 1 0			1 0 1 1 0			2 0 1 1 0		
Volume Module:												
Base Vol:	159	788	494	176	1515	274	126	284	117	568	321	131
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:	159	788	494	176	1515	274	126	284	117	568	321	131
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:	159	788	494	176	1515	274	126	284	117	568	321	131
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:	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 Volume:	159	788	494	176	1515	274	126	284	117	568	321	131
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	159	788	494	176	1515	274	126	284	117	568	321	131
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.:	159	788	494	176	1515	274	126	284	117	568	321	131
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.86	0.80	0.93	0.87	0.87	0.87	0.83	0.83	0.89	0.87	0.87
Lanes:	1.00	3.00	1.00	1.00	2.54	0.46	1.00	1.42	0.58	2.00	1.42	0.58
Final Sat.:	1702	4891	1523	1769	4206	761	1655	2241	923	3359	2360	963
Capacity Analysis Module:												
Vol/Sat:	0.09	0.16	0.32	0.10	0.36	0.36	0.08	0.13	0.13	0.17	0.14	0.14
Crit Moves:	****				****			****		****		
Green/Cycle:	0.11	0.40	0.40	0.12	0.42	0.42	0.15	0.15	0.15	0.20	0.20	0.20
Volume/Cap:	0.86	0.40	0.81	0.81	0.86	0.86	0.52	0.86	0.86	0.86	0.70	0.70
Delay/Veh:	84.6	25.7	39.6	70.8	36.0	36.0	49.3	65.5	65.5	58.2	48.3	48.3
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:	84.6	25.7	39.6	70.8	36.0	36.0	49.3	65.5	65.5	58.2	48.3	48.3
HCM2kAvg:	9	7	18	9	23	23	5	10	10	13	9	9

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 ORE 99W/Sherwood Blvd

Cycle (sec): 120　Critical Vol./Cap. (X): 0.801
Loss Time (sec): 16 (Y+R = 4 sec)　Average Delay (sec/veh): 38.1
Optimal Cycle: 93　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			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2 1 0			1 0 2 1 0			1 0 1 0 1			1 1 0 0 1		
Volume Module:												
Base Vol:	73	1406	106	240	1715	146	137	240	144	265	191	88
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:	73	1406	106	240	1715	146	137	240	144	265	191	88
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:	73	1406	106	240	1715	146	137	240	144	265	191	88
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:	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 Volume:	73	1406	106	240	1715	146	137	240	144	265	191	88
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	73	1406	106	240	1715	146	137	240	144	265	191	88
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.:	73	1406	106	240	1715	146	137	240	144	265	191	88
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	0.87	0.87	0.93	0.88	0.88	0.94	0.99	0.84	0.96	0.96	0.84
Lanes:	1.00	2.79	0.21	1.00	2.76	0.24	1.00	1.00	1.00	1.16	0.84	1.00
Final Sat.:	1736	4594	346	1769	4628	394	1787	1881	1599	2125	1532	1599
Capacity Analysis Module:												
Vol/Sat:	0.04	0.31	0.31	0.14	0.37	0.37	0.08	0.13	0.09	0.12	0.12	0.06
Crit Moves:		****		****				****			****	
Green/Cycle:	0.06	0.38	0.38	0.17	0.50	0.50	0.16	0.16	0.16	0.16	0.16	0.16
Volume/Cap:	0.75	0.80	0.80	0.80	0.75	0.75	0.48	0.80	0.57	0.80	0.80	0.35
Delay/Veh:	82.7	35.5	35.5	62.1	25.6	25.6	47.2	62.8	49.5	56.8	56.8	46.1
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:	82.7	35.5	35.5	62.1	25.6	25.6	47.2	62.8	49.5	56.8	56.8	46.1
HCM2kAvg:	4	18	18	11	19	19	5	11	6	10	10	3

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #4 ORE 99W/Meinecke

Cycle (sec): 120 Critical Vol./Cap. (X): 0.717
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 16.4
Optimal Cycle: 64 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 2 0 1			1 0 2 0 1			1 0 1 0 1			1 0 1 0 1		
Volume Module:												
Base Vol:	11	1375	53	252	2017	47	15	13	15	56	11	108
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:	11	1375	53	252	2017	47	15	13	15	56	11	108
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:	11	1375	53	252	2017	47	15	13	15	56	11	108
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:	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 Volume:	11	1375	53	252	2017	47	15	13	15	56	11	108
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	1375	53	252	2017	47	15	13	15	56	11	108
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	1375	53	252	2017	47	15	13	15	56	11	108
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.81	0.93	0.93	0.83	0.76	1.00	0.85	0.74	0.97	0.83
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1718	3437	1537	1769	3538	1583	1444	1900	1615	1398	1845	1568
Capacity Analysis Module:												
Vol/Sat:	0.01	0.40	0.03	0.14	0.57	0.03	0.01	0.01	0.01	0.04	0.01	0.07
Crit Moves:	****				****							****
Green/Cycle:	0.01	0.59	0.59	0.21	0.80	0.80	0.10	0.10	0.10	0.10	0.10	0.10
Volume/Cap:	0.72	0.67	0.06	0.67	0.72	0.04	0.11	0.07	0.10	0.42	0.06	0.72
Delay/Veh:	155.1	17.5	10.3	48.4	6.8	2.6	49.9	49.5	49.8	53.2	49.5	67.9
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:	155.1	17.5	10.3	48.4	6.8	2.6	49.9	49.5	49.8	53.2	49.5	67.9
HCM2kAvg:	1	18	1	10	18	0	1	0	1	3	0	5

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #5 ORE 99W/Sunset

Cycle (sec): 120 Critical Vol./Cap. (X): 0.849
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 31.3
Optimal Cycle: 97 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			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2 0 1			2 0 2 0 1			0 1 0 0 1			0 1 0 0 1		
Volume Module:												
Base Vol:	87	1204	146	330	1764	27	16	156	204	137	97	190
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:	87	1204	146	330	1764	27	16	156	204	137	97	190
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:	87	1204	146	330	1764	27	16	156	204	137	97	190
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:	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 Volume:	87	1204	146	330	1764	27	16	156	204	137	97	190
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	87	1204	146	330	1764	27	16	156	204	137	97	190
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.:	87	1204	146	330	1764	27	16	156	204	137	97	190
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.81	0.90	0.93	0.83	0.94	0.94	0.83	0.57	0.57	0.83
Lanes:	1.00	2.00	1.00	2.00	2.00	1.00	0.09	0.91	1.00	0.59	0.41	1.00
Final Sat.:	1718	3437	1537	3432	3538	1583	167	1628	1583	638	452	1568
Capacity Analysis Module:												
Vol/Sat:	0.05	0.35	0.09	0.10	0.50	0.02	0.10	0.10	0.13	0.21	0.21	0.12
Crit Moves:	****				****						****	
Green/Cycle:	0.06	0.51	0.51	0.14	0.59	0.59	0.25	0.25	0.25	0.25	0.25	0.25
Volume/Cap:	0.85	0.69	0.19	0.69	0.85	0.03	0.38	0.38	0.51	0.85	0.85	0.48
Delay/Veh:	100.9	23.6	16.2	53.4	23.9	10.4	37.6	37.6	39.5	63.8	63.8	39.0
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:	100.9	23.6	16.2	53.4	23.9	10.4	37.6	37.6	39.5	63.8	63.8	39.0
HCM2kAvg:	6	17	3	7	29	0	6	5	7	16	17	6

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 ORE 99W/Brookman

Average Delay (sec/veh): 3.7 Worst Case Level Of Service: F[102.9]

Approach:	North Bound	South Bound	East Bound	West Bound
Control:	Uncontrolled	Uncontrolled	Stop Sign	Stop Sign
Rights:	Include	Include	Include	Include
Lanes:	1 0 1 1 0	1 0 1 1 0	0 0 11 0 0	0 0 1! 0 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Volume Module:												
Base Vol:	18	1369	38	27	1946	28	26	1	25	63	5	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:	18	1369	38	27	1946	28	26	1	25	63	5	3
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:	18	1369	38	27	1946	28	26	1	25	63	5	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:	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 Volume:	18	1369	38	27	1946	28	26	1	25	63	5	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	18	1369	38	27	1946	28	26	1	25	63	5	3
Critical Gap Module:												
Critical Gp:	4.2	xxxx	xxxxx	4.1	xxxx	xxxxx	7.5	6.5	6.9	7.6	6.6	7.0
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	1974	xxxx	xxxxx	1407	xxxx	xxxxx	2737	3457	987	2451	3452	704
Potent Cap.:	282	xxxx	xxxxx	481	xxxx	xxxxx	10	7	246	15	6	375
Move Cap.:	282	xxxx	xxxxx	481	xxxx	xxxxx	2	6	246	11	6	375
Total Cap:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	53	75	xxxxx	100	64	xxxxx
Volume/Cap:	0.06	xxxx	xxxx	0.06	xxxx	xxxx	0.49	0.01	0.10	0.63	0.08	0.01
Level Of Service Module:												
Queue:	0.2	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	18.6	xxxx	xxxxx	12.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	C	*	*	B	*	*	*	*	*	*	*	*
Movement:	LT	- LTR -	RT	LT	- LTR -	RT	LT	- LTR -	RT	LT	- LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	86	xxxxx	xxxx	99	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	2.8	xxxxx	xxxxx	3.7	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	97.7	xxxxx	xxxxx	103	xxxxx
Shared LOS:	*	*	*	*	*	*	*	F	*	*	F	*
ApproachDel:		xxxxxx			xxxxxx			97.7			102.9	
ApproachLOS:		*			*			F			F	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #7 Tualatin-Sherwood/Cipole

Cycle (sec):	120	Critical Vol./Cap. (X):	0.562
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	15.7
Optimal Cycle:	46	Level Of Service:	B

Approach:	North Bound	South Bound	East Bound	West Bound
Control:	Split Phase	Split Phase	Protected	Protected
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	0 0 0 0 0	1 0 0 0 1	1 0 2 0 0	0 0 1 1 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Volume Module:												
Base Vol:	0	0	0	96	0	170	80	1054	0	0	1141	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:	0	0	0	96	0	170	80	1054	0	0	1141	51
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:	0	0	0	96	0	170	80	1054	0	0	1141	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:	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 Volume:	0	0	0	96	0	170	80	1054	0	0	1141	51
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	96	0	170	80	1054	0	0	1141	51
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.:	0	0	0	96	0	170	80	1054	0	0	1141	51
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.90	1.00	0.81	0.91	0.91	1.00	1.00	0.90	0.90
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.91	0.09
Final Sat.:	0	0	0	1718	0	1537	1736	3473	0	0	3270	146
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.06	0.00	0.11	0.05	0.30	0.00	0.00	0.35	0.35
Crit Moves:						****	****				****	
Green/Cycle:	0.00	0.00	0.00	0.20	0.00	0.20	0.08	0.70	0.00	0.00	0.62	0.62
Volume/Cap:	0.00	0.00	0.00	0.28	0.00	0.56	0.56	0.43	0.00	0.00	0.56	0.56
Delay/Veh:	0.0	0.0	0.0	41.5	0.0	45.9	58.0	7.7	0.0	0.0	13.6	13.6
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:	0.0	0.0	0.0	41.5	0.0	45.9	58.0	7.7	0.0	0.0	13.6	13.6
HCM2kAvg:	0	0	0	3	0	6	4	8	0	0	13	12

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 Tualatin-Sherwood/Oregon

Cycle (sec):	120	Critical Vol./Cap. (X):	0.753
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	22.1
Optimal Cycle:	71	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:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 0 1 0			0 0 1! 0 0			1 0 1 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	117	6	161	10	11	1	3	1090	93	387	1263	5
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	6	161	10	11	1	3	1090	93	387	1263	5
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:	117	6	161	10	11	1	3	1090	93	387	1263	5
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:	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 Volume:	117	6	161	10	11	1	3	1090	93	387	1263	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	117	6	161	10	11	1	3	1090	93	387	1263	5
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.:	117	6	161	10	11	1	3	1090	93	387	1263	5
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.72	0.82	0.82	0.82	0.82	0.82	0.90	0.89	0.89	0.93	0.93	0.93
Lanes:	1.00	0.04	0.96	0.45	0.50	0.05	1.00	1.84	0.16	1.00	1.99	0.01
Final Sat.:	1371	56	1507	707	778	71	1702	3099	264	1769	3520	14
Capacity Analysis Module:												
Vol/Sat:	0.09	0.11	0.11	0.01	0.01	0.01	0.00	0.35	0.35	0.22	0.36	0.36
Crit Moves:		****						****		****		
Green/Cycle:	0.14	0.14	0.43	0.14	0.14	0.14	0.00	0.47	0.47	0.29	0.75	0.75
Volume/Cap:	0.60	0.75	0.25	0.10	0.10	0.10	0.48	0.75	0.75	0.75	0.48	0.48
Delay/Veh:	53.5	63.0	21.8	45.0	45.0	45.0	107.1	28.4	28.4	44.8	5.8	5.8
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:	53.5	63.0	21.8	45.0	45.0	45.0	107.1	28.4	28.4	44.8	5.8	5.8
HCM2kAvg:	6	7	4	1	1	1	1	19	19	15	9	7

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #9 Tualatin-Sherwood/Gerda

Average Delay (sec/veh): 3.7 Worst Case Level Of Service: F[64.2]

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 1			1 0 2 0 0			0 0 1 1 0		
Volume Module:												
Base Vol:	0	0	0	53	0	76	33	956	0	0	1187	47
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	53	0	76	33	956	0	0	1187	47
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:	0	0	0	53	0	76	33	956	0	0	1187	47
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:	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 Volume:	0	0	0	53	0	76	33	956	0	0	1187	47
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	53	0	76	33	956	0	0	1187	47
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	6.8	xxxx	6.9	4.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1755	xxxx	617	1234	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	76	xxxx	433	539	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	73	xxxx	433	539	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	xxxx	0.73	xxxx	0.18	0.06	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	3.4	xxxx	0.6	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	134.7	xxxx	15.1	12.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	F	*	C	B	*	*	*	*	*
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
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		xxxxxx			64.2			xxxxxx			xxxxxx	
ApproachLOS:		*			F			*			*	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #10 Tualatin-Sherwood/Langer

Average Delay (sec/veh): 1.7 Worst Case Level Of Service: B[13.3]

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	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	0	0	133	0	0	25	7	849	12	145	971	10
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	133	0	0	25	7	849	12	145	971	10
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:	0	0	133	0	0	25	7	849	12	145	971	10
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:	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 Volume:	0	0	133	0	0	25	7	849	12	145	971	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	133	0	0	25	7	849	12	145	971	10
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	7.0	xxxxx	xxxx	7.0	4.3	xxxx	xxxxx	4.2	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	3.3	xxxxx	xxxx	3.4	2.3	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	431	xxxx	xxxx	491	981	xxxx	xxxxx	861	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	565	xxxx	xxxx	510	664	xxxx	xxxxx	770	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	565	xxxx	xxxx	510	664	xxxx	xxxxx	770	xxxx	xxxxx
Volume/Cap:	xxxx	xxxx	0.24	xxxx	xxxx	0.05	0.01	xxxx	xxxx	0.19	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.7	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	10.5	xxxx	xxxxx	10.8	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	B	*	*	B	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	565	xxxx	xxxx	510	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	0.9	xxxxx	xxxx	0.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	13.3	xxxxx	xxxx	12.4	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	B	*	*	B	*	*	*	*	*	*
ApproachDel:		13.3			12.4			xxxxxx			xxxxxx	
ApproachLOS:		B			B			*			*	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Tualatin-Sherwood/Regal Cinema

Cycle (sec): 120 Critical Vol./Cap. (X): 0.518
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 19.3
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:	Split Phase			Split Phase			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	1 0	1	2 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	139	13	69	2	18	22	28	770	197	101	913	8
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:	139	13	69	2	18	22	28	770	197	101	913	8
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:	139	13	69	2	18	22	28	770	197	101	913	8
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:	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 Volume:	139	13	69	2	18	22	28	770	197	101	913	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	139	13	69	2	18	22	28	770	197	101	913	8
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.:	139	13	69	2	18	22	28	770	197	101	913	8
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.93	0.86	0.86	0.94	0.99	0.84	0.85	0.85	0.85	0.91	0.91	0.91
Lanes:	1.00	0.16	0.84	1.00	1.00	1.00	2.00	1.59	0.41	1.00	1.98	0.02
Final Sat.:	1769	258	1369	1787	1881	1599	3243	2579	660	1736	3439	30
Capacity Analysis Module:												
Vol/Sat:	0.08	0.05	0.05	0.00	0.01	0.01	0.01	0.30	0.30	0.06	0.27	0.27
Crit Moves:	****					****		****		****		
Green/Cycle:	0.15	0.15	0.15	0.03	0.03	0.03	0.02	0.58	0.58	0.11	0.67	0.67
Volume/Cap:	0.52	0.33	0.33	0.04	0.36	0.52	0.40	0.52	0.52	0.52	0.40	0.40
Delay/Veh:	48.6	45.3	46.3	57.3	61.8	68.5	61.6	15.6	15.6	52.6	9.2	9.2
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:	48.6	45.3	46.3	57.3	61.8	68.5	61.6	15.6	15.6	52.6	9.2	9.2
HCM2kAvg:	6	3	3	0	1	2	1	11	11	4	8	7

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #12 Roy Rogers/Borchers

Cycle (sec): 60 Critical Vol./Cap. (X): 0.559
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 7.6
Optimal Cycle: 41 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:	Split Phase			Split Phase			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 0	0	1 0	1 0	1	0 0
Volume Module:												
Base Vol:	96	0	21	0	0	0	0	488	166	21	576	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:	96	0	21	0	0	0	0	488	166	21	576	0
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:	96	0	21	0	0	0	0	488	166	21	576	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:	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 Volume:	96	0	21	0	0	0	0	488	166	21	576	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	96	0	21	0	0	0	0	488	166	21	576	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	1.00	1.00	1.00	1.00	1.00
Final Vol.:	96	0	21	0	0	0	0	488	166	21	576	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.91	1.00	0.82	1.00	1.00	1.00	1.00	0.91	0.91	0.90	0.95	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	1.00	0.75	0.25	1.00	1.00	0.00
Final Sat.:	1736	0	1554	0	0	0	1900	1286	437	1718	1809	0
Capacity Analysis Module:												
Vol/Sat:	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.38	0.38	0.01	0.32	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.68	0.68	0.02	0.70	0.00
Volume/Cap:	0.56	0.00	0.14	0.00	0.00	0.00	0.00	0.56	0.56	0.56	0.45	0.00
Delay/Veh:	29.9	0.0	25.1	0.0	0.0	0.0	0.0	5.6	5.6	46.5	4.2	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:	29.9	0.0	25.1	0.0	0.0	0.0	0.0	5.6	5.6	46.5	4.2	0.0
HCM2kAvg:	3	0	0	0	0	0	0	7	7	1	5	0

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #13 Oregon/Tonquin

Average Delay (sec/veh): 11.5 Worst Case Level Of Service: E[35.3]

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	1 0	0	0 1
Volume Module:												
Base Vol:	0	135	124	79	473	0	0	0	0	275	0	90
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	135	124	79	473	0	0	0	0	275	0	90
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:	0	135	124	79	473	0	0	0	0	275	0	90
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:	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 Volume:	0	135	124	79	473	0	0	0	0	275	0	90
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	135	124	79	473	0	0	0	0	275	0	90
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	259	xxxx	xxxxx	xxxx	xxxx	xxxxx	766	xxxx	135
Potent Cap.:	xxxx	xxxx	xxxxx	1300	xxxx	xxxxx	xxxx	xxxx	xxxxx	369	xxxx	911
Move Cap.:	xxxx	xxxx	xxxxx	1300	xxxx	xxxxx	xxxx	xxxx	xxxxx	351	xxxx	911
Volume/Cap:	xxxx	xxxx	xxxx	0.06	xxxx	xxxx	xxxx	xxxx	xxxx	0.78	xxxx	0.10
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	xxxx	0.3
Stopped Del:	xxxxx	xxxx	xxxxx	7.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx	43.8	xxxx	9.4
LOS by Move:	*	*	*	A	*	*	*	*	*	E	*	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
SharedQueue:	xxxxx	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	7.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	A	*	*	*	*	*	*	*	*
ApproachDel:		xxxxxx			xxxxxx			xxxxxx			35.3	
ApproachLOS:		*			*			*			E	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
FHWA Roundabout Method (Future Volume Alternative)

Intersection #14 Oregon/Murdock

Average Delay (sec/veh): 6.0 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:	Yield Sign			Yield Sign			Yield Sign			Yield Sign		
Lanes:		1			0			1			1	
Volume Module:												
Base Vol:	16	0	155	0	0	0	0	90	34	444	224	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:	16	0	155	0	0	0	0	90	34	444	224	0
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:	16	0	155	0	0	0	0	90	34	444	224	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:	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 Volume:	16	0	155	0	0	0	0	90	34	444	224	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	16	0	155	0	0	0	0	90	34	444	224	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	1.00	1.00	1.00	1.00	1.00
Final Vol.:	16	0	155	0	0	0	0	90	34	444	224	0
PCE Module:												
AutoPCE:	16	0	150	0	0	0	0	86	33	440	222	0
TruckPCE:	1	0	7	0	0	0	0	4	2	7	3	0
ComboPCE:	0	0	0	0	0	0	0	2	1	0	0	0
BicyclePCE:	0	0	0	0	0	0	0	0	0	0	0	0
AdjVolume:	16	0	157	0	0	0	0	92	35	446	225	0
Delay Module: >> Time Period: 0.25 hours <<												
CircVolume:		92			688			446			16	
MaxVolume:		1150			xxxxxx			959			1191	
PedVolume:		0			0			0			0	
AdjMaxVol:		1150			xxxxxx			959			1191	
ApproachVol:		174			xxxxxx			127			671	
ApproachDel:		3.7			xxxxxx			4.3			6.8	
Queue:		0.5			xxxx			0.5			3.7	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #15 Murdock/Willamette

Average Delay (sec/veh): 1.0 Worst Case Level Of Service: B[13.4]

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:	8	162	4	15	342	12	14	4	4	3	2	5
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:	8	162	4	15	342	12	14	4	4	3	2	5
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:	8	162	4	15	342	12	14	4	4	3	2	5
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:	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 Volume:	8	162	4	15	342	12	14	4	4	3	2	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	8	162	4	15	342	12	14	4	4	3	2	5
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.2	6.6	6.3	7.3	6.7	6.4
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.6	4.1	3.4	3.7	4.2	3.5
Capacity Module:												
Cnflict Vol:	354	xxxx	xxxxx	166	xxxx	xxxxx	562	560	348	562	564	164
Potent Cap.:	1205	xxxx	xxxxx	1418	xxxx	xxxxx	430	430	684	416	415	843
Move Cap.:	1205	xxxx	xxxxx	1418	xxxx	xxxxx	421	423	684	405	408	843
Volume/Cap:	0.01	xxxx	xxxx	0.01	xxxx	xxxx	0.03	0.01	0.01	0.01	0.00	0.01
Level Of Service Module:												
Queue:	0.0	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	8.0	xxxx	xxxxx	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
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	453	xxxxx	xxxx	548	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.2	xxxxx	xxxxx	0.1	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	13.4	xxxxx	xxxxx	11.7	xxxxx
Shared LOS:	*	*	*	*	*	*	*	B	*	*	B	*
ApproachDel:		xxxxxx			xxxxxx			13.4			11.7	
ApproachLOS:		*			*			B			B	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #16 Sunset/Murdock

Cycle (sec):	100	Critical Vol./Cap. (X):	0.393
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	10.2
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		
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			1 0 0 1 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	201	57	4	19	46	240	93	12	133	1	8	11
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:	201	57	4	19	46	240	93	12	133	1	8	11
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:	201	57	4	19	46	240	93	12	133	1	8	11
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:	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 Volume:	201	57	4	19	46	240	93	12	133	1	8	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	201	57	4	19	46	240	93	12	133	1	8	11
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.:	201	57	4	19	46	240	93	12	133	1	8	11
Saturation Flow Module:												
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:	0.77	0.22	0.01	0.06	0.15	0.79	1.00	0.08	0.92	0.05	0.40	0.55
Final Sat.:	525	149	10	48	117	611	540	54	596	30	238	327
Capacity Analysis Module:												
Vol/Sat:	0.38	0.38	0.38	0.39	0.39	0.39	0.17	0.22	0.22	0.03	0.03	0.03
Crit Moves:		****		****					****		****	
Delay/Veh:	11.0	11.0	11.0	10.2	10.2	10.2	10.3	9.2	9.2	8.5	8.5	8.5
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
AdjDel/Veh:	11.0	11.0	11.0	10.2	10.2	10.2	10.3	9.2	9.2	8.5	8.5	8.5
LOS by Move:	B	B	B	B	B	B	B	A	A	A	A	A
ApproachDel:		11.0			10.2			9.6			8.5	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		11.0			10.2			9.6			8.5	
LOS by Appr:		B			B			A			A	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #17 Sunset/Sherwood

Cycle (sec):	100	Critical Vol./Cap. (X):	0.832
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	23.0
Optimal Cycle:	0	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			Stop Sign			Stop Sign		
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:	36	104	27	65	187	170	78	224	37	51	348	74
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:	36	104	27	65	187	170	78	224	37	51	348	74
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:	36	104	27	65	187	170	78	224	37	51	348	74
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:	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 Volume:	36	104	27	65	187	170	78	224	37	51	348	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	36	104	27	65	187	170	78	224	37	51	348	74
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.:	36	104	27	65	187	170	78	224	37	51	348	74
Saturation Flow Module:												
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:	1.00	0.79	0.21	1.00	0.52	0.48	1.00	0.86	0.14	1.00	0.82	0.18
Final Sat.:	395	338	88	442	261	237	437	408	67	460	418	89
Capacity Analysis Module:												
Vol/Sat:	0.09	0.32	0.31	0.15	0.72	0.72	0.18	0.55	0.55	0.11	0.83	0.83
Crit Moves:		****				****		****			****	
Delay/Veh:	11.5	13.5	13.5	11.8	24.2	24.2	12.2	17.8	17.8	11.2	34.0	34.0
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:	11.9	13.5	13.5	11.8	24.2	24.2	12.2	17.8	17.8	11.2	34.0	34.0
LOS by Move:	B	B	B	B	C	C	B	C	C	B	D	D
ApproachDel:		13.2			22.3			16.6			31.6	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		13.2			22.3			16.6			31.6	
LOS by Appr:		B			C			C			D	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #18 Edy/Elwert

Cycle (sec): 100 Critical Vol./Cap. (X): 0.566
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 11.4
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		
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 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	9	122	26	72	344	15	7	45	10	28	61	41
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:	9	122	26	72	344	15	7	45	10	28	61	41
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:	9	122	26	72	344	15	7	45	10	28	61	41
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:	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 Volume:	9	122	26	72	344	15	7	45	10	28	61	41
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	9	122	26	72	344	15	7	45	10	28	61	41
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.:	9	122	26	72	344	15	7	45	10	28	61	41
Saturation Flow Module:												
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:	0.06	0.78	0.16	0.17	0.80	0.03	0.11	0.73	0.16	0.21	0.47	0.32
Final Sat.:	41	551	117	127	608	27	67	431	96	136	297	200
Capacity Analysis Module:												
Vol/Sat:	0.22	0.22	0.22	0.57	0.57	0.57	0.10	0.10	0.10	0.21	0.21	0.21
Crit Moves:		****				****		****			****	
Delay/Veh:	9.1	9.1	9.1	13.2	13.2	13.2	9.0	9.0	9.0	9.4	9.4	9.4
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:	9.1	9.1	9.1	13.2	13.2	13.2	9.0	9.0	9.0	9.4	9.4	9.4
LOS by Move:	A	A	A	B	B	B	A	A	A	A	A	A
ApproachDel:	9.1			13.2			9.0			9.4		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	9.1			13.2			9.0			9.4		
LOS by Appr:	A			B			A			A		

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #19 Edy/Borchers

Cycle (sec): 100 Critical Vol./Cap. (X): 0.495
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 13.7
Optimal Cycle: 45 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:	0 0 0 0 0			1 0 0 0 1			1 0 1 0 0			0 0 0 1 0		
Volume Module:												
Base Vol:	0	0	0	266	0	65	22	325	0	0	471	132
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	266	0	65	22	325	0	0	471	132
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:	0	0	0	266	0	65	22	325	0	0	471	132
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:	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 Volume:	0	0	0	266	0	65	22	325	0	0	471	132
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	266	0	65	22	325	0	0	471	132
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.:	0	0	0	266	0	65	22	325	0	0	471	132
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.94	1.00	0.84	0.93	0.98	1.00	1.00	0.95	0.95
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.78	0.22
Final Sat.:	0	0	0	1787	0	1599	1769	1862	0	0	1411	395
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.15	0.00	0.04	0.01	0.17	0.00	0.00	0.33	0.33
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.30	0.00	0.30	0.03	0.70	0.00	0.00	0.67	0.67
Volume/Cap:	0.00	0.00	0.00	0.50	0.00	0.14	0.50	0.25	0.00	0.00	0.50	0.50
Delay/Veh:	0.0	0.0	0.0	29.5	0.0	25.6	56.5	5.6	0.0	0.0	8.3	8.3
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	0.0	0.0	29.5	0.0	25.6	56.5	5.6	0.0	0.0	8.3	8.3
HCM2kAvg:	0	0	0	7	0	1	1	4	0	0	9	9

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                                  Sherwood TSP
                         Future (2020) Build (Mitigated)
                                  PM Peak Hour
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                       Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
*********************************************************************************
Intersection #20 Sherwood/Langer
*********************************************************************************
Average Delay (sec/veh):     11.5   Worst Case Level Of Service:       C[ 18.0]
*********************************************************************************
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  0  1  0    1  0  0  1  0    1  0  0  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0     0    47     0     0   259   139   320    23    14   189   313
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    47     0     0   259   139   320    23    14   189   313
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:    0     0    47     0     0   259   139   320    23    14   189   313
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:     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 Volume:     0     0    47     0     0   259   139   320    23    14   189   313
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Final Vol.:     0     0    47     0     0   259   139   320    23    14   189   313
Critical Gap Module:
Critical Gp:xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx   7.1   6.5   6.2   7.2   6.6   6.3
FollowUpTim:xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx   3.5   4.0   3.3   3.6   4.1   3.4
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx  xxxx xxxxx  xxxx  xxxx xxxxx   404   177   130   325   283    24
Potent Cap.: xxxx  xxxx xxxxx  xxxx  xxxx xxxxx   557   717   920   621   620  1042
Move Cap.:   xxxx  xxxx xxxxx  xxxx  xxxx xxxxx   298   717   920   394   620  1042
Volume/Cap:  xxxx  xxxx  xxxx  xxxx  xxxx  xxxx  0.47  0.45  0.02  0.04  0.31  0.30
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx   2.3  xxxx xxxxx   0.1   0.5 xxxxx
Stopped Del:xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx  27.3  xxxx xxxxx  14.5  11.9 xxxxx
LOS by Move:    *     *     *     *     *     *     D     *     *     B     B     *
Movement:     LT  - LTR  - RT    LT  - LTR  - RT    LT  - LTR  - RT    LT  - LTR  - RT
Shared Cap.: xxxx  xxxx xxxxx  xxxx  xxxx xxxxx  xxxx  xxxx   728  xxxx  xxxx   900
SharedQueue:xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx xxxxx  xxxx   2.5 xxxxx  xxxx   2.4
Shrd StpDel:xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx xxxxx  xxxx  14.3 xxxxx  xxxx  12.3
Shared LOS:     *     *     *     *     *     *     *     *     B     *     *     B
ApproachDel:       xxxxxx            xxxxxx             18.0             12.3
ApproachLOS:          *                 *                 C                B
```



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---------------------------------------------------------------------------------
                                  Sherwood TSP
                         Future (2020) Build (Mitigated)
                                  PM Peak Hour
---------------------------------------------------------------------------------

                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*********************************************************************************
Intersection #21 Sherwood/Century
*********************************************************************************
Cycle (sec):         100              Critical Vol./Cap. (X):          0.507
Loss Time (sec):       0 (Y+R = 4 sec) Average Delay (sec/veh):          18.7
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  0  1! 0  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      18   395    64    70   491    43    25    40    52   285    94    60
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:   18   395    64    70   491    43    25    40    52   285    94    60
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:   18   395    64    70   491    43    25    40    52   285    94    60
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:     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 Volume:    18   395    64    70   491    43    25    40    52   285    94    60
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   18   395    64    70   491    43    25    40    52   285    94    60
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.:    18   395    64    70   491    43    25    40    52   285    94    60
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  0.94  0.97  0.97  0.93  0.97  0.97  0.87  0.87  0.87  0.73  0.93  0.93
Lanes:       1.00  0.86  0.14  1.00  0.92  0.08  0.21  0.34  0.45  1.00  0.61  0.39
Final Sat.:  1787  1585   257  1769  1692   148   354   566   736  1379  1082   690
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01  0.25  0.25  0.04  0.29  0.29  0.07  0.07  0.07  0.21  0.09  0.09
Crit Moves:  ****                    ****                          ****
Green/Cycle: 0.02  0.51  0.51  0.08  0.57  0.57  0.41  0.41  0.41  0.41  0.41  0.41
Volume/Cap:  0.51  0.49  0.49  0.49  0.51  0.51  0.17  0.17  0.17  0.51  0.21  0.21
Delay/Veh:   60.0  16.3  16.3  46.5  13.3  13.3  19.0  19.0  19.0  22.9  19.4  19.4
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:  60.0  16.3  16.3  46.5  13.3  13.3  19.0  19.0  19.0  22.9  19.4  19.4
HCM2kAvg:       1     9     9     3    10    10     2     2     2     9     3     3
*********************************************************************************
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--------------------------------------------------------------------------------
                                 Sherwood TSP
                        Future (2020) Build (Mitigated)
                                 PM Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #22 Sherwood-Pine/3rd
********************************************************************************
Average Delay (sec/veh):      3.3     Worst Case Level Of Service:      D[ 25.6]
********************************************************************************
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  0  0  0    0  0  0  1  0    0  1  0  0  0
------------|-----------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     105    0   27      0    0    0      0  421  162     45  383    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:  105    0   27      0    0    0      0  421  162     45  383    0
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:  105    0   27      0    0    0      0  421  162     45  383    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:     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 Volume:   105    0   27      0    0    0      0  421  162     45  383    0
Reduct Vol:     0    0    0      0    0    0      0    0    0      0    0    0
Final Vol.:   105    0   27      0    0    0      0  421  162     45  383    0
Critical Gap Module:
Critical Gp:  6.4 xxxx  6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx    4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx  3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx    2.2 xxxx xxxxx
------------|-----------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  975 xxxx  502  xxxx xxxx xxxxx  xxxx xxxx xxxxx    583 xxxx xxxxx
Potent Cap.:  281 xxxx  573  xxxx xxxx xxxxx  xxxx xxxx xxxxx    986 xxxx xxxxx
Move Cap.:    271 xxxx  573  xxxx xxxx xxxxx  xxxx xxxx xxxxx    986 xxxx xxxxx
Volume/Cap:  0.39 xxxx 0.05  xxxx xxxx  xxxx  xxxx xxxx  xxxx   0.05 xxxx  xxxx
------------|-----------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx    0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx    8.8 xxxx xxxxx
LOS by Move:    *    *    *      *    *    *      *    *    *      A    *    *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  304 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  2.1 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx    0.1 xxxx xxxxx
Shrd StpDel:xxxxx 25.6 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx    8.8 xxxx xxxxx
Shared LOS:     *    D    *      *    *    *      *    *    *      A    *    *
ApproachDel:        25.6           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:          D               *                *                *
```



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--------------------------------------------------------------------------------
                                 Sherwood TSP
                        Future (2020) Build (Mitigated)
                                 PM Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #23 Pine/Oregon
********************************************************************************
Average Delay (sec/veh):      8.9     Worst Case Level Of Service:      D[ 25.5]
********************************************************************************
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    0  1  0  0  0    0  0  0  1  0
------------|-----------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0   44    0     74   63  122     92  216    0      0  203  100
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   44    0     74   63  122     92  216    0      0  203  100
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:    0   44    0     74   63  122     92  216    0      0  203  100
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:     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 Volume:     0   44    0     74   63  122     92  216    0      0  203  100
Reduct Vol:     0    0    0      0    0    0      0    0    0      0    0    0
Final Vol.:     0   44    0     74   63  122     92  216    0      0  203  100
Critical Gap Module:
Critical Gp:xxxxx  6.5 xxxxx    7.2  6.6  6.3    4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx  4.0 xxxxx    3.5  4.0  3.3    2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|-----------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx  730 xxxxx    694  680  270    315 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx  352 xxxxx    353  369  761   1240 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx  317 xxxxx    292  333  751   1227 xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx 0.14  xxxx   0.25 0.19 0.16   0.07 xxxx  xxxx  xxxx xxxx  xxxx
------------|-----------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx  0.5 xxxxx xxxxx xxxx xxxxx    0.2 xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx 18.2 xxxxx xxxxx xxxx xxxxx    8.2 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    C    *      *    *    *      A    *    *      *    *    *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  428 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx  3.9 xxxxx    0.2 xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 25.5 xxxxx    8.2 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *    *      *    D    *      A    *    *      *    *    *
ApproachDel:        18.2             25.5           xxxxxx           xxxxxx
ApproachLOS:          C                D                *                *
```

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #24 Washington/Railroad

Cycle (sec): 100 Critical Vol./Cap. (X): 0.188
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 7.8
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		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1 0 0 0			0 0 1! 0 0			0 0 0 1 0			0 0 0 1 0		
Volume Module:												
Base Vol:	8	89	0	26	124	12	0	8	26	0	2	23
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:	8	89	0	26	124	12	0	8	26	0	2	23
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:	8	89	0	26	124	12	0	8	26	0	2	23
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:	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 Volume:	8	89	0	26	124	12	0	8	26	0	2	23
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	89	0	26	124	12	0	8	26	0	2	23
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.:	8	89	0	26	124	12	0	8	26	0	2	23
Saturation Flow Module:												
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:	0.08	0.92	0.00	0.16	0.77	0.07	0.00	0.24	0.76	0.00	0.08	0.92
Final Sat.:	68	757	0	138	659	64	0	198	643	0	69	788
Capacity Analysis Module:												
Vol/Sat:	0.12	0.12	xxxx	0.19	0.19	0.19	xxxx	0.04	0.04	xxxx	0.03	0.03
Crit Moves:	****			****					****		****	
Delay/Veh:	7.8	7.8	0.0	8.1	8.1	8.1	0.0	7.2	7.2	0.0	7.1	7.1
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:	7.8	7.8	0.0	8.1	8.1	8.1	0.0	7.2	7.2	0.0	7.1	7.1
LOS by Move:	A	A	*	A	A	A	*	A	A	*	A	A
ApproachDel:		7.8			8.1			7.2			7.1	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		7.8			8.1			7.2			7.1	
LOS by Appr:		A			A			A			A	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #25 Washington/3rd

Cycle (sec): 100 Critical Vol./Cap. (X): 0.120
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 7.5
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		
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 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	16	7	1	15	29	51	46	37	18	3	15	4
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:	16	7	1	15	29	51	46	37	18	3	15	4
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:	16	7	1	15	29	51	46	37	18	3	15	4
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:	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 Volume:	16	7	1	15	29	51	46	37	18	3	15	4
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	16	7	1	15	29	51	46	37	18	3	15	4
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.:	16	7	1	15	29	51	46	37	18	3	15	4
Saturation Flow Module:												
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:	0.67	0.29	0.04	0.16	0.30	0.54	0.45	0.37	0.18	0.14	0.68	0.18
Final Sat.:	530	232	33	141	272	478	382	308	150	113	563	150
Capacity Analysis Module:												
Vol/Sat:	0.03	0.03	0.03	0.11	0.11	0.11	0.12	0.12	0.12	0.03	0.03	0.03
Crit Moves:	****			****			****			****		
Delay/Veh:	7.5	7.5	7.5	7.4	7.4	7.4	7.7	7.7	7.7	7.3	7.3	7.3
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:	7.5	7.5	7.5	7.4	7.4	7.4	7.7	7.7	7.7	7.3	7.3	7.3
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:		7.5			7.4			7.7			7.3	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		7.5			7.4			7.7			7.3	
LOS by Appr:		A			A			A			A	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #26 Sherwood/Railroad

Cycle (sec): 100 Critical Vol./Cap. (X): 0.448
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 10.7
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	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		0 0 0 1 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0	
Volume Module:												
Base Vol:	0	11	10	158	9	9	30	281	5	6	152	97
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	11	10	158	9	9	30	281	5	6	152	97
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:	0	11	10	158	9	9	30	281	5	6	152	97
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:	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 Volume:	0	11	10	158	9	9	30	281	5	6	152	97
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	11	10	158	9	9	30	281	5	6	152	97
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.:	0	11	10	158	9	9	30	281	5	6	152	97
Saturation Flow Module:												
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:	0.00	0.52	0.48	0.90	0.05	0.05	0.09	0.89	0.02	0.02	0.60	0.38
Final Sat.:	0	317	289	557	32	32	67	627	11	18	447	285
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.03	0.03	0.28	0.28	0.28	0.45	0.45	0.45	0.34	0.34	0.34
Crit Moves:			****	****				****			****	
Delay/Veh:	0.0	8.4	8.4	10.3	10.3	10.3	11.7	11.7	11.7	9.8	9.8	9.8
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
AdjDel/Veh:	0.0	8.4	8.4	10.3	10.3	10.3	11.7	11.7	11.7	9.8	9.8	9.8
LOS by Move:	*	A	A	B	B	B	B	B	B	A	A	A
ApproachDel:		8.4			10.3			11.7			9.8	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		8.4			10.3			11.7			9.8	
LOS by Appr:		A			B			B			A	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #27 Cipole/Herman

Cycle (sec): 100 Critical Vol./Cap. (X): 0.284
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 9.2
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	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		0 0 1! 0 0			0 0 0 0 0			0 0 0 1 0			0 1 0 0 0	
Volume Module:												
Base Vol:	150	0	52	0	0	0	0	47	96	111	99	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:	150	0	52	0	0	0	0	47	96	111	99	0
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:	150	0	52	0	0	0	0	47	96	111	99	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:	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 Volume:	150	0	52	0	0	0	0	47	96	111	99	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	150	0	52	0	0	0	0	47	96	111	99	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	1.00	1.00	1.00	1.00	1.00
Final Vol.:	150	0	52	0	0	0	0	47	96	111	99	0
Saturation Flow Module:												
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:	0.74	0.00	0.26	0.00	0.00	0.00	0.00	0.33	0.67	0.53	0.47	0.00
Final Sat.:	536	0	186	0	0	0	0	262	536	390	348	0
Capacity Analysis Module:												
Vol/Sat:	0.28	xxxx	0.28	xxxx	xxxx	xxxx	xxxx	0.18	0.18	0.28	0.28	xxxx
Crit Moves:	****							****			****	
Delay/Veh:	9.5	0.0	9.5	0.0	0.0	0.0	0.0	8.2	8.2	9.5	9.5	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:	9.5	0.0	9.5	0.0	0.0	0.0	0.0	8.2	8.2	9.5	9.5	0.0
LOS by Move:	A	*	A	*	*	*	*	A	A	A	A	*
ApproachDel:		9.5			xxxxxx			8.2			9.5	
Delay Adj:		1.00			xxxxx			1.00			1.00	
ApprAdjDel:		9.5			xxxxxx			8.2			9.5	
LOS by Appr:		A			*			A			A	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
FHWA Roundabout Method (Future Volume Alternative)

Intersection #28 Meinecke/Dewey

Average Delay (sec/veh): 3.7 Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Control:	Yield Sign	Yield Sign	Yield Sign	Yield Sign
Lanes:	0	1	1	1

Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	0	0	0	127	0	127	52	36	0	0	52	110
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	127	0	127	52	36	0	0	52	110
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:	0	0	0	127	0	127	52	36	0	0	52	110
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:	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 Volume:	0	0	0	127	0	127	52	36	0	0	52	110
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	127	0	127	52	36	0	0	52	110
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.:	0	0	0	127	0	127	52	36	0	0	52	110
PCE Module:												
AutoPCE:	0	0	0	126	0	126	52	36	0	0	51	108
TruckPCE:	0	0	0	2	0	2	0	0	0	0	2	3
ComboPCE:	0	0	0	0	0	0	0	0	0	0	0	0
BicyclePCE:	0	0	0	0	0	0	0	0	0	0	0	0
AdjVolume:	0	0	0	128	0	128	52	36	0	0	53	111

Delay Module: >> Time Period: 0.25 hours <<

	North Bound	South Bound	East Bound	West Bound
CircVolume:	216	53	128	52
MaxVolume:	xxxxxx	1172	1131	1172
PedVolume:	0	0	0	0
AdjMaxVol:	xxxxxx	1172	1131	1172
ApproachVol:	xxxxxx	255	88	164
ApproachDel:	xxxxxx	3.9	3.5	3.6
Queue:	xxxx	0.8	0.3	0.5

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #29 Brookman/Ladd Hill

Average Delay (sec/veh): 2.6 Worst Case Level Of Service: B[10.2]

Approach:	North Bound	South Bound	East Bound	West Bound
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 11 0 0	0 0 0 0 0

Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	37	82	0	0	98	74	38	0	26	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:	37	82	0	0	98	74	38	0	26	0	0	0
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:	37	82	0	0	98	74	38	0	26	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:	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 Volume:	37	82	0	0	98	74	38	0	26	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	37	82	0	0	98	74	38	0	26	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.5	xxxx	6.3	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.6	xxxx	3.4	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	172	xxxx	xxxxx	xxxx	xxxx	xxxxx	291	xxxx	135	xxxx	xxxx	xxxxx
Potent Cap.:	1411	xxxx	xxxxx	xxxx	xxxx	xxxxx	689	xxxx	901	xxxx	xxxx	xxxxx
Move Cap.:	1411	xxxx	xxxxx	xxxx	xxxx	xxxxx	675	xxxx	901	xxxx	xxxx	xxxxx
Volume/Cap:	0.03	xxxx	xxxx	xxxx	xxxx	xxxx	0.06	xxxx	0.03	xxxx	xxxx	xxxx
Level Of Service Module:												
Queue:	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	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	752	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.3	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	7.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	10.2	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	B	*	*	*	*
ApproachDel:		xxxxxx			xxxxxx			10.2			xxxxxx	
ApproachLOS:		*			*			B			*	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #30 Sunset/Pine

Average Delay (sec/veh): 2.4 Worst Case Level Of Service: C[21.4]

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 1 0 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module:												
Base Vol:	5	2	0	79	1	11	13	286	8	1	465	55
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:	5	2	0	79	1	11	13	286	8	1	465	55
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:	5	2	0	79	1	11	13	286	8	1	465	55
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:	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 Volume:	5	2	0	79	1	11	13	286	8	1	465	55
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	5	2	0	79	1	11	13	286	8	1	465	55
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	831	840	xxxxx	814	816	509	522	xxxx	xxxxx	294	xxxx	xxxxx
Potent Cap.:	291	304	xxxxx	297	311	565	1050	xxxx	xxxxx	1273	xxxx	xxxxx
Move Cap.:	279	299	xxxxx	292	307	557	1048	xxxx	xxxxx	1273	xxxx	xxxxx
Volume/Cap:	0.02	0.01	xxxx	0.27	0.00	0.02	0.01	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.0	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.5	xxxx	xxxxx	7.8	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	284	xxxx	xxxxx	xxxx	310	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.1	xxxx	xxxxx	xxxxx	1.2	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	18.0	xxxx	xxxxx	xxxxx	21.4	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	C	*	*	*	C	*	*	*	*	*	*	*
ApproachDel:		18.0			21.4			xxxxxx			xxxxxx	
ApproachLOS:		C			C			*			*	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #31 Sunset/Pinehurst

Cycle (sec):	100	Critical Vol./Cap. (X):	0.635
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	13.5
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	
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			1 0 0 1 0			1 0 0 1 0		
Volume Module:												
Base Vol:	25	15	37	62	18	15	56	280	41	76	313	115
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	15	37	62	18	15	56	280	41	76	313	115
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:	25	15	37	62	18	15	56	280	41	76	313	115
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:	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 Volume:	25	15	37	62	18	15	56	280	41	76	313	115
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	25	15	37	62	18	15	56	280	41	76	313	115
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.:	25	15	37	62	18	15	56	280	41	76	313	115
Saturation Flow Module:												
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:	0.32	0.19	0.49	0.65	0.19	0.16	1.00	0.87	0.13	1.00	0.73	0.27
Final Sat.:	176	106	261	349	101	84	577	560	82	593	493	181
Capacity Analysis Module:												
Vol/Sat:	0.14	0.14	0.14	0.18	0.18	0.18	0.10	0.50	0.50	0.13	0.63	0.63
Crit Moves:		****			****			****				****
Delay/Veh:	9.8	9.8	9.8	10.2	10.2	10.2	9.4	13.3	13.3	9.5	16.3	16.3
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:	9.8	9.8	9.8	10.2	10.2	10.2	9.4	13.3	13.3	9.5	16.3	16.3
LOS by Move:	A	A	A	B	B	B	A	B	B	A	C	C
ApproachDel:		9.8			10.2			12.7			15.3	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.8			10.2			12.7			15.3	
LOS by Appr:		A			B			B			C	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #32 Sunset/Woodhaven

Average Delay (sec/veh): 5.6 Worst Case Level Of Service: D[30.9]

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 1 0 1			1 0 0 1 0	
Volume Module:												
Base Vol:	11	4	5	49	4	98	188	408	26	3	316	52
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:	11	4	5	49	4	98	188	408	26	3	316	52
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:	11	4	5	49	4	98	188	408	26	3	316	52
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:	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 Volume:	11	4	5	49	4	98	188	408	26	3	316	52
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	11	4	5	49	4	98	188	408	26	3	316	52
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1197	1168	413	1155	1168	356	373	xxxx	xxxxx	439	xxxx	xxxxx
Potent Cap.:	162	193	637	175	194	690	1197	xxxx	xxxxx	1121	xxxx	xxxxx
Move Cap.:	118	160	634	149	162	682	1192	xxxx	xxxxx	1116	xxxx	xxxxx
Volume/Cap:	0.09	0.02	0.01	0.33	0.02	0.14	0.16	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.6	xxxx	xxxxx	0.0	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.6	xxxx	xxxxx	8.2	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	159	xxxxx	xxxx	303	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.4	xxxxx	xxxxx	2.6	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	30.9	xxxxx	xxxxx	28.1	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	D	*	*	D	*	*	*	*	*	*	*
ApproachDel:		30.9			28.1			xxxxxx			xxxxxx	
ApproachLOS:		D			D			*			*	

Sherwood TSP
Future (2020) Build (Mitigated)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #33 Elwert/Swanstrom

Average Delay (sec/veh): 0.6 Worst Case Level Of Service: B[10.8]

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			0 1 0 0 0			0 0 0 0 0			0 0 1! 0 0	
Volume Module:												
Base Vol:	0	144	13	13	371	0	0	0	0	11	0	11
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	144	13	13	371	0	0	0	0	11	0	11
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:	0	144	13	13	371	0	0	0	0	11	0	11
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:	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 Volume:	0	144	13	13	371	0	0	0	0	11	0	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	144	13	13	371	0	0	0	0	11	0	11
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	157	xxxx	xxxxx	xxxx	xxxx	xxxxx	547	xxxx	151
Potent Cap.:	xxxx	xxxx	xxxxx	1429	xxxx	xxxxx	xxxx	xxxx	xxxxx	501	xxxx	901
Move Cap.:	xxxx	xxxx	xxxxx	1429	xxxx	xxxxx	xxxx	xxxx	xxxxx	498	xxxx	901
Volume/Cap:	xxxx	xxxx	xxxx	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	0.02	xxxx	0.01
Level Of Service Module:												
Queue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Stopped Del:	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	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	641	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	10.8	xxxxx
Shared LOS:	*	*	*	A	*	*	*	*	*	*	B	*
ApproachDel:		xxxxxx			xxxxxx			xxxxxx			10.8	
ApproachLOS:		*			*			*			B	

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--------------------------------------------------------------------------------
                               Sherwood TSP
                      Future (2020) Build (Mitigated)
                               PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
       2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #34 Elwert/Kruger
********************************************************************************
Average Delay (sec/veh):        8.4     Worst Case Level Of Service:     B[ 10.6]
********************************************************************************
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  1  0  0  0    0  0  0  1  0    0  1  0  0  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      21    0   172     0    0     0     0    5    23   359    4     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:   21    0   172     0    0     0     0    5    23   359    4     0
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:   21    0   172     0    0     0     0    5    23   359    4     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:     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 Volume:    21    0   172     0    0     0     0    5    23   359    4     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    21    0   172     0    0     0     0    5    23   359    4     0
Critical Gap Module:
Critical Gp:  6.4 xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|----------------||----------------||----------------||----------------|
Capacity Module:
Cnflict Vol:  739 xxxx    17  xxxx xxxx xxxxx  xxxx xxxx xxxxx    28 xxxx xxxxx
Potent Cap.:  386 xxxx  1065  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1592 xxxx xxxxx
Move Cap.:    302 xxxx  1065  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1592 xxxx xxxxx
Volume/Cap:  0.07 xxxx  0.16  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.23 xxxx  xxxx
------------|----------------||----------------||----------------||----------------|
Level Of Service Module:
Queue:       xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.9 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  836 xxxxx     0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.9 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.9 xxxx xxxxx
Shrd StpDel:xxxxx 10.6 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx
Shared LOS:     *    B     *     *    *     *     *    *     *     A    *     *
ApproachDel:       10.6           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         B               *                *                *
```



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--------------------------------------------------------------------------------
                               Sherwood TSP
                      Future (2020) Build (Mitigated)
                               PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
       2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #35 Oregon/Lincoln
********************************************************************************
Average Delay (sec/veh):        0.3     Worst Case Level Of Service:     B[ 11.4]
********************************************************************************
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  0  0  0    0  0  0  1  0    0  1  0  0  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      14    0     6     0    0     0     0  179    26    26  228     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:   14    0     6     0    0     0     0  179    26    26  228     0
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:   14    0     6     0    0     0     0  179    26    26  228     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:     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 Volume:    14    0     6     0    0     0     0  179    26    26  228     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    14    0     6     0    0     0     0  179    26    26  228     0
Critical Gap Module:
Critical Gp:  6.5 xxxx   6.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.6 xxxx   3.4 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|----------------||----------------||----------------||----------------|
Capacity Module:
Cnflict Vol:  485 xxxx   193  xxxx xxxx xxxxx  xxxx xxxx xxxxx   206 xxxx xxxxx
Potent Cap.:  532 xxxx   836  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1365 xxxx xxxxx
Move Cap.:    519 xxxx   835  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1364 xxxx xxxxx
Volume/Cap:  0.03 xxxx  0.01  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.02 xxxx  xxxx
------------|----------------||----------------||----------------||----------------|
Level Of Service Module:
Queue:       xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.7 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  585 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.1 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Shrd StpDel:xxxxx 11.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.7 xxxx xxxxx
Shared LOS:     *    B     *     *    *     *     *    *     *     A    *     *
ApproachDel:       11.4           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         B               *                *                *
```

Improvement Plans and Costs

Century/Sherwood Roundabout

Engineer's Estimate Harper Houf Peterson Righellis Inc. *(KKV)*

Job Number: DKS-06, March 2004

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LS	1	$15,000.00	$15,000.00
2	Temporary Protection and Direction of Traffic	LS	1	$20,000.00	$20,000.00
3	Removal of Structures and Obstructions	LS	1	$2,500.00	$2,500.00
4	Roadway Excavation	CY	1360	$8.00	$10,880.00
5	Sawcutting	LF	250	$1.50	$375.00
6	Level 3 Asphalt Paving	TN	775	$45.00	$34,875.00
7	Concrete Curb and Gutter	LF	740	$12.00	$8,880.00
8	PC Conc. Mountable Island	SY	345	$35.00	$12,075.00
9	PC Conc. Sidewalk	SY	400	$28.00	$11,200.00
10	Conc. Traffic Island	SY	100	$30.00	$3,000.00
11	Permanent Pavement Striping	LS	1	$3,000.00	$3,000.00
12	Roadway Signing	LS	1	$2,000.00	$2,000.00
13	Miscellaneous Private Property Improvements	LS	1	$10,000.00	$10,000.00
14	Miscellaneous Public Improvements	LS	1	$10,000.00	$10,000.00
15	Erosion Control and Water Quality	LS	1	$1,000.00	$1,000.00
16	Bark Mulch	UNIT	4	$185.00	$740.00
17	Ground Cover Landscaping	SY	430	$50.00	$21,500.00
18	Irrigation System	LS	1	$4,000.00	$4,000.00
19	Landscape Maintenance	LS	1	$500.00	$500.00
20	10% Contingency	LS	1	$17,152.50	$17,152.50
	Total Construction Estimate				**$ 188,677.50**

Engineering and Design					
	Engineering and Construction Management	LS	1	$35,000.00	$40,000.00
	Permitting	LS	1	$1,000.00	$1,000.00
	Inspection	LS	1	$4,000.00	$4,000.00
	Total for Engineering and Design				**$ 45,000.00**
Surveying					
	Topographic Survey	LS	1	$4,800.00	$4,800.00
	ROW-Pre	LS	1	$2,500.00	$2,500.00
	Construction Staking	LS	1	$2,500.00	$2,500.00
	ROW-Post	LS	1	$2,500.00	$2,500.00
	Total for Survey				**$ 12,300.00**
ROW Acquisition					
	Lot 500 - Residential	SF	32	$5.00	$160.00
	Lot 5000 - Residential*	SF	1470	$10.00	$14,700.00
	Lot 2500 - Commercial	SF	312	$12.00	$3,744.00
	Right-of-way acquisition costs	EA	3	$3,500.00	$10,500.00
	Total for Right-of-way				**$ 29,104.00**
	* Note: Lot 5000 may require full take.				
	Total Estimate				**$ 275,081.50**

Century/Sherwood Roundabout
Offset Centerline

***Engineer's Estimate Harper Houf Peterson Righellis Inc.** (KKV)*

Job Number: DKS-06, March 2004

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LS	1	$15,000.00	$15,000.00
2	Temporary Protection and Direction of Traffic	LS	1	$20,000.00	$20,000.00
3	Removal of Structures and Obstructions	LS	1	$2,500.00	$2,500.00
4	Roadway Excavation	CY	1360	$8.00	$10,880.00
5	Sawcutting	LF	250	$1.50	$375.00
6	Level 3 Asphalt Paving	TN	775	$45.00	$34,875.00
7	Concrete Curb and Gutter	LF	740	$12.00	$8,880.00
8	PC Conc. Mountable Island	SY	345	$35.00	$12,075.00
9	PC Conc. Sidewalk	SY	400	$28.00	$11,200.00
10	Conc. Traffic Island	SY	100	$30.00	$3,000.00
11	Permanent Pavement Striping	LS	1	$3,000.00	$3,000.00
12	Roadway Signing	LS	1	$2,000.00	$2,000.00
13	Miscellaneous Private Property Improvements	LS	1	$10,000.00	$10,000.00
14	Miscellaneous Public Improvements	LS	1	$20,000.00	$20,000.00
15	Erosion Control and Water Quality	LS	1	$1,000.00	$1,000.00
16	Bark Mulch	UNIT	4	$185.00	$740.00
17	Ground Cover Landscaping	SY	430	$50.00	$21,500.00
18	Irrigation System	LS	1	$4,000.00	$4,000.00
19	Landscape Maintenance	LS	1	$500.00	$500.00
20	10% Contingency	LS	1	$18,152.50	$18,152.50
	Total Construction Estimate				**$ 199,677.50**

		Unit	Quantity	Unit Price	Total
Engineering and Design					
	Engineering and Construction Management	LS	1	$35,000.00	$40,000.00
	Permitting	LS	1	$1,000.00	$1,000.00
	Inspection	LS	1	$4,000.00	$4,000.00
	Total for Engineering and Design				**$ 45,000.00**
Surveying					
	Topographic Survey	LS	1	$4,800.00	$4,800.00
	ROW-Pre	LS	1	$2,500.00	$2,500.00
	Construction Staking	LS	1	$2,500.00	$2,500.00
	ROW-Post	LS	1	$2,500.00	$2,500.00
	Total for Survey				**$ 12,300.00**
ROW Acquisition					
	Lot 500 - Residential	SF	215	$5.00	$1,075.00
	Lot 5000 - Residential*	SF	520	$10.00	$5,200.00
	Lot 2500 - Commercial	SF	34	$12.00	$408.00
	Right-of-way acquisition costs	EA	3	$3,500.00	$10,500.00
	Total for Right-of-way				**$17,183.00**
	* Note: Lot 5000 may require full take.				
	Total Estimate				**$ 274,160.50**

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Engineer's Estimate Harper Houf Peterson Righellis Inc. *(KKV)*

Job Number: DKS-06, March 2004

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LS	1	$50,000.00	$50,000.00
2	Temporary Protection and Direction of Traffic	LS	1	$20,000.00	$20,000.00
3	Removal of Structures and Obstructions	LS	1	$10,000.00	$10,000.00
3	Clearing and Grubbing	LS	1	$10,000.00	$10,000.00
4	Roadway Excavation	CY	5000	$8.00	$40,000.00
5	Sawcutting	LF	250	$2.00	$500.00
6	Aggregate Base 1-1/2-0	CY	2500	$28.00	$70,000.00
7	Level 3 Asphalt Paving	TN	3650	$45.00	$164,250.00
8	Concrete Curb and Gutter	LF	1220	$12.00	$14,640.00
9	Round about Apron Curb	LF	452	$18.00	$8,136.00
10	Standard Concrete Sidewalk (includes ramps)	SY	1025	$25.00	$25,625.00
11	PC Conc. Mountable Island	SY	780	$35.00	$27,300.00
12	Signal Modifications	LS	1	$50,000.00	$50,000.00
13	Detectable Warining Surface	SF	12	$72.00	$864.00
14	Roadway Lighting Complete	LS	1	$75,000.00	$75,000.00
15	Permanent Pavement Striping	LS	1	$10,000.00	$10,000.00
16	Roadway Signing	LS	1	$1,500.00	$1,500.00
17	Miscellaneous Private Property Improvments	LS	1	$10,000.00	$10,000.00
18	Miscellaneous Public Improvments	LS	1	$25,000.00	$25,000.00
19	Erosion Control and Water Quality	LS	1	$10,000.00	$10,000.00
20	Sedding and Fertilization	SF	4000	$2.00	$8,000.00
21	Bark Mulch	UNIT	6	$185.00	$1,110.00
22	Planter Strip Ground Cover	SY	1600	$80.00	$128,000.00
23	Street Trees	EA	47	$200.00	$9,400.00
24	Landscape Maintenance	LS	1	$2,500.00	$2,500.00
25	12" Storm Pipe	LF	1000	$40.00	$40,000.00
26	Storm Manhole	EA	6	$2,500.00	$15,000.00
27	G2 Catch Basin	EA	8	$1,000.00	$8,000.00
28	Ditch Inlets	EA	4	$1,200.00	$4,800.00
29	10% Cintingency	LS	1	$83,962.50	$83,962.50
	Total Construction Estimate				**$923,587.50**

Engineering and Design				
Engineering and Construction Management	LS	1	$65,000.00	$70,000.00
Permitting	LS	1	$5,000.00	$3,000.00
Inspection	LS	1	$20,000.00	$15,000.00
Total for Engineering and Design				**$ 88,000.00**
Surveying				
Topographic Survey	LS	1	$10,000.00	$10,000.00
ROW Pre-survey	LS	1	$6,500.00	$6,500.00
Construction Staking	LS	1	$11,000.00	$11,000.00
ROW Post	LS	1	$4,500.00	$4,500.00
Survey Total				**$ 32,000.00**
Right-of way				
Tax Lot 206	SF	80000	$5.00	$400,000.00
Tax Lot 600	SF	5300	$5.00	$26,500.00
Right-of-way Acquisition Cost	EA	2	$3,500.00	$7,000.00
Right-of-way Total				**$433,500.00**
Total Estimate				**$ 1,477,087.50**

Tonquin/Oregon Intersection

Engineer's Estimate *Harper Houf Peterson Righellis Inc. (KKV)*

Job Number: DKS-06, March 2004

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LS	1	$50,000.00	$50,000.00
2	Temporary Protection and Direction of Traffic	LS	1	$20,000.00	$20,000.00
3	Removal of Structures and Obstructions	LS	1	$10,000.00	$10,000.00
4	Clearing and Grubbing	LS	1	$10,000.00	$10,000.00
5	Roadway Excavation	CY	2500	$8.00	$20,000.00
6	Sawcutting	LF	1800	$2.00	$3,600.00
7	Aggregate Base 1-1/2-0	CY	4500	$28.00	$126,000.00
8	Level 3 Asphalt Paving	TN	1700	$45.00	$76,500.00
9	Concrete Curb and Gutter	LF	1316	$12.00	$15,792.00
10	Round about Apron Curb	LF	390	$18.00	$7,020.00
11	Standard Concrete Sidewalk (includes ramps)	SY	4885	$25.00	$122,125.00
12	PC Conc. Mountable Island	SY	514	$35.00	$17,990.00
13	Detectable Warining Surface	SF	12	$72.00	$864.00
14	Roadway Lighting Complete	LS	1	$25,000.00	$25,000.00
15	Permanent Pavement Striping	LS	1	$3,000.00	$3,000.00
16	Roadway Signing	LS	1	$6,500.00	$6,500.00
17	Miscellaneous Public Improvements	LS	1	$25,000.00	$25,000.00
18	Miscellaneous Private Property Improvements	LS	1	$10,000.00	$10,000.00
19	Erosion Control and Water Quality	LS	1	$10,000.00	$10,000.00
20	Wetland Mitigation	LS	1	$2,500.00	$2,500.00
21	Seeding and Fertilization	SF	4000	$2.00	$8,000.00
22	Bark Mulch	UNIT	6	$185.00	$1,110.00
23	Planter Strip Ground Cover	SY	150	$80.00	$12,000.00
24	Street Trees	EA	5	$200.00	$1,000.00
25	Landscape Maintenance	LS	1	$2,500.00	$2,500.00
26	12" Storm Pipe	LF	400	$40.00	$16,000.00
27	Storm Manhole	EA	3	$2,500.00	$7,500.00
28	Connect to Existing Manhole	EA	1	$1,500.00	$1,500.00
29	G2 Catch Basin	EA	4	$900.00	$3,600.00
30	Adjust Existing Manhole	EA	1	$1,200.00	$1,200.00
31	Reconstruct Existing Manhole	EA	1	$2,500.00	$2,500.00
32	Fire Hydrant Relocation	EA	1	$3,500.00	$3,500.00
33	Retaining Wall	SF	1000	$55.00	$55,000.00
34	10% Contingency	LS	1	$67,730.10	$67,730.10
	Total Construction Estimate				**$ 745,031.10**
Engineering and Design					
	Engineering and Construction Management	LS	1	$65,000.00	$65,000.00
	Permitting	LS	1	$10,000.00	$10,000.00
	Inspection	LS	1	$20,000.00	$20,000.00
	Total for Engineering and Design				**$ 95,000.00**
Surveying					
	Topographic Survey	LS	1	$5,500.00	$5,500.00
	ROW Pre	LS	1	$4,500.00	$4,500.00
	Construction Staking	LS	1	$7,500.00	$7,500.00
	ROW Post	LS	1	$2,500.00	$2,500.00
	ROW and Easement Exhibits	EA	3	$350.00	$1,050.00
	Survey Total				**$ 21,050.00**
Right-of way					
	Tax Lot 500	SF	6585	$ 12.00	$79,020.00
	Right-of-way Acquisition Cost	EA	1	$ 3,500.00	$3,500.00
	Right-of-way Total				**$ 82,520.00**
	Total Estimate				**$ 943,601.10**

Villa Street/First Street Connection

***Engineer's Estimate Harper Houf Peterson Righellis Inc.** (KKV)*

Job Number: DKS-06, March 2004

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LS	1	$90,000.00	$90,000.00
2	Temporary Protection and Direction of Traffic	LS	1	$10,000.00	$10,000.00
3	Clearing and Grubbing	LS	1	$35,000.00	$35,000.00
4	Roadway Embankment	CY	10000	$15.00	$150,000.00
5	Sawcutting	LF	200	$1.50	$300.00
6	Aggregate Base 1-1/2-0	CY	1800	$28.00	$50,400.00
7	Geotextile Fabric	SY	3888	$2.00	$7,776.00
8	Level 3 Asphalt Paving	TN	2510	$45.00	$112,950.00
9	Standard Concrete Curb	LF	3100	$26.00	$80,600.00
10	Standard Concrete Sidewalk (includes ramps)	SY	2070	$25.00	$51,750.00
11	Concrete Driveway Aprons	SY	500	$28.00	$14,000.00
12	Asphalt Driveway Reconstruction	SY	500	$50.00	$25,000.00
13	Gravel Driveway Reconstruction	SY	500	$12.00	$6,000.00
14	Roadway Lighting Complete	LS	1	$120,000.00	$120,000.00
15	Permanent Pavement Striping	LS	1	$3,000.00	$3,000.00
16	Roadway Signing	LS	1	$5,000.00	$5,000.00
17	Erosion Control and Wetland Mitigation	AC	1.25	$25,000.00	$31,250.00
18	Miscellaneous Private Property Improvements	LS	1	$30,000.00	$30,000.00
19	Miscellaneous Public Improvements	LS	1	$40,000.00	$40,000.00
20	Seeding and Fertilization	SF	31250	$2.00	$62,500.00
21	Bark Mulch	UNIT	2	$185.00	$370.00
22	Planter Strip Ground Cover	SY	1500	$80.00	$120,000.00
23	Street Trees	EA	85	$200.00	$17,000.00
24	Landscape Maintenance	LS	1	$5,000.00	$5,000.00
25	12 x 15 Culvert	LF	240	$1,000.00	$240,000.00
26	12" Storm Pipe	LF	600	$45.00	$27,000.00
27	G2 Catch Basin	EA	12	$1,200.00	$14,400.00
28	Standard Manholes	EA	4	$2,000.00	$8,000.00
29	10" Dutile Iron Pipe	LF	1600	$40.00	$64,000.00
30	Fire Hydrant Installation	EA	2	$2,500.00	$5,000.00
31	Connect to Existing Waterline	EA	2	$800.00	$1,600.00
32	10% Cintingency	LS	1	$142,789.60	$142,789.60
	Total Construction Estimate				$ 1,570,685.60

Engineering and Design						
	Engineering and Construction Management					$150,000.00
	Permitting					$15,000.00
	Inspection					$60,000.00
	Total Engineering					**$ 225,000.00**
Surveying						
	Topographic Survey					$15,000.00
	ROW Pre					$9,000.00
	Construction					$20,000.00
	ROW Post					$4,800.00
	ROW and EASE Acquisition					$6,000.00
	Survey Total					**$ 54,800.00**
Right-of-Way						
	Right of way	SF	43200	$ 10.00		$ 432,000.00
	Easement	SF	7785	$ 8.00		$ 62,280.00
	Right-of-way Acquisition Cost	EA	15	$ 3,500.00		$ 52,500.00
	Total Real Estate Acquisition					**$ 546,780.00**
	Project Total					**$ 2,397,265.60**
Bridge Option						
	Single Span Bridge	LF	100	$7,000.00		**$700,000.00**
	Add Engineering and Survey for Bridge	LS	1			$25,000.00
	Project Total With Bridge Option					**$ 2,882,265.60**

Note: It is assumed there will be no cost other than paperwork costs for converting City property to right-of-way and easement.

City of Sherwood
Transportation System Plan

Prepared for

City of Sherwood Oregon
Home of the Tualatin River National Wildlife Refuge

Submitted by
DKS *Associates*
TRANSPORTATION SOLUTIONS

March 2005

Adopted Ordinance 2005-006
March 15, 2005

City of Sherwood, Oregon
ORDINANCE 2005-006

AN ORDINANCE APPROVING A PLAN MAP AND TEXT AMENDMENT, ESTABLISHING CHANGES TO CHAPTER 6 OF THE SHERWOOD COMMUNITY DEVELOPMENT PLAN COMPREHENSIVE PLAN PART 2, AMENDING THE TRANSPORTATION PLAN MAP, ADOPTING A NEW TRANSPORTATION SYSTEM PLAN, AND ESTABLISHING AN EFFECTIVE DATE.

WHEREAS, the existing Transportation Plan Update, approved through Resolution 90-473 and incorporated into the Comprehensive Plan, Part 2 by Ordinance 91-922, is outdated and a new Transportation System Plan was needed to meet the Transportation Planning Rule (OAR 660-012), the Regional Transportation Plan policies, Metro Urban Growth Management Functional Plan standards, and manage new growth expected in the next twenty years; and

WHEREAS, The City Council approved Resolution 2003-019 that authorized city staff to begin the development of a new TSP on February 25, 2003; and

WHEREAS, Chapter 6 of the Sherwood Comprehensive Plan, Part 2, and Transportation Plan Map is to be amended, and a new Transportation System Plan is required in response to a need to update the public facility element for planned transportation facilities consistent with recent and projected growth; and

WHEREAS, the Sherwood Planning Commission conducted public hearings on the proposed plan map and text amendment, referred to as File No. PA 04-03, on November 1 & 16th, January 4th, and February 15th, held work sessions open to the public on October 5, December 7th & February 1st, and held open houses on May 5, 2004 and February 1st and 14th 2005, and recommended approval of the plan map and text amendment to the City Council on February 15, 2005; and

WHEREAS, the Sherwood City Council conducted public hearings on the proposed plan map and text amendment on March 1st and15th; and

WHEREAS, the Community Development and Zoning Code Section 4.203.01 & 4.203.02 specifies the criteria to approve a change to the Comprehensive Plan Map and Text, and that the Sherwood City Council finds that the proposal complies based on the findings of fact recommended by the Planning Commission; and

WHEREAS, the Sherwood City Council has received the application materials, the City's Planning Staff report (PA 04-03), supporting documents, Transportation System Plan April 2005, the Planning Commission findings, and the Council reviewed the materials submitted, and the findings of fact of the proposal, and conducted public hearings.

NOW, THEREFORE, THE CITY ORDAINS AS FOLLOWS:

Section 1. Commission Review & Public Hearings. That the application for a Plan Map & Text Amendment (File No. PA 04-03) to amend the Transportation Plan Map and Chapter 6 of the Comprehensive Plan (Part 2), and adoption of a Transportation System Plan as a technical appendix to the Comprehensive Plan (Part 2) was subject to full and proper review, and public hearings were held before the Planning Commission on November 1 & 16th, January 4th, and February 15th and the City Council on March 1st and15th.

Section 2. Findings. That after full and due consideration of the application, multiple City Staff reports, the record, findings, and of the evidence presented at the public hearings, the Council finds that the proposed plan map and text amendments are appropriate to revise the Sherwood Community Development Plan and Comprehensive Plan & Map; and adopt a new TSP consistent with state law, and therefore, the Council adopts the findings of fact contained in the staff reports and recommendation from Planning Commission dated February 22, 2005, and amended by the Council findings as stipulated in the Notice of Decision "Exhibit A".

Section 3. Approval. That a request for a Plan Map & Text Amendment is hereby **APPROVED** as stipulated in the Notice of Decision dated March 15, 2005; labeled "Exhibit A", and such amendments constitute changes to Chapter 6 "Exhibit C", Transportation Plan Map "Exhibit C", and Transportation System Plan March 2005 "Exhibit B" attached to this ordinance.

Section 4. Manager Authorized. The Planning Supervisor is hereby directed to take such action as may be necessary to document this amendment.

Section 5. Effective Date. This ordinance shall become effective the 30th day after its adoption by the City Council.

Duly passed by the City Council this 15th day of March, 2005.

Approved by the Mayor this 15th day of March, 2005.

Keith S. Mays, Mayor

Attest:

C.L. Wiley, City Recorder

	AYE	NAY
Luman	✓	
King	✓	
Henderson	✓	
Heironimus	abstain	
Grant	✓	
Durrell	✓	
Mays	✓	

DKS *Associates*

TRANSPORTATION SOLUTIONS

March 15, 2005

Kevin Cronin, AICP
Planning Supervisor
City of Sherwood
20 N.W. Washington Street
Sherwood, OR 97140

Subject: Sherwood Transportation System Plan P 03057-000

Dear Kevin:

DKS Associates is pleased to submit this Transportation System Plan to the City of Sherwood. This final report reflects comments and revisions collected from the TAC, City Staff, City Council, ODOT, TriMet, the public and other interested stakeholders. We are very pleased that your City Council adopted this document for your use.

It has been a pleasure to work with you, and the rest of the TSP team, in completing this document that will direct transportation investments in the City of Sherwood for the next 20 years.

Regards,

***DKS** Associates*

Carl Springer, P.E.
Principal

REGISTERED PROFESSIONAL ENGINEER
18910PE
OREGON
JAN. 21, 1997
CARL D. SPRINGER
EXPIRES: 06/30/06

DKS 25 YEARS

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ACKNOWLEGEMENTS

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

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Dave Wechner, City of Sherwood

Citizen's Advisory Committee (Planning Commission)

Adrian Emery, Chair
Patrick Allen, Vice-Chair
Dan Balza
Kevin Henry
Jean Lafayette
Matt Nolan

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1. SUMMARY

Overview

This Sherwood Transportation System Plan (TSP) identifies projects and programs needed to support the City's Goals and Policies and to serve planned growth over the next 20 years. This document presents the investments and priorities for the Pedestrian, Bicycle, Transit, and Motor Vehicle systems along with new transportation programs to correct existing shortfalls and enhance critical services. For each travel mode, a Master Plan project map and list are identified to support the city's transportation goals and policies. The most critical elements of these Master Plans are referred to as Action Plans. The final chapter identifies the estimated plan costs and makes recommendations about potential new funding sources to support the plan.

Plan Process and Committees

The Sherwood TSP was developed in close coordination with Sherwood city staff and key representatives from the surrounding communities. Two formal committees were formed to participate in the plan development:

- *Technical Advisory Committee* – Agency staff from Metro, Oregon Department of Transportation, Tualatin Valley Fire & Rescue, TriMet, Washington County, Tualatin and Sherwood participated in reviewing the technical methods and findings of the study. The focus of this group was on consistency with the plans and past decisions in adjoining jurisdictions, and consensus on new recommendations.
- *Citizen Advisory Committee* – The Sherwood Planning Commission served as the representatives for citizens and community members. A series of meetings were held with the Planning Commissioners to report interim study findings and any outstanding policy issues that required their direction. The meetings were through the standard Planning Commission hearing process, and were open to participation by the general public.

The committees met regularly through the plan development process to review interim work products, assist in developing and ranking transportation solutions, and to refine master plan elements to ensure consistency with community goals.

Three public meetings were held, beginning in May 2004, to present the initial TSP elements to the community. The public feedback from that meeting was compiled for the record, and changes were incorporated into the revised Public Draft TSP document. The Public Draft TSP was then submitted to the Planning Commission, who held public hearings and other open houses to make further refinements, as appropriate, before recommending the Plan to the City Council for approval and implementation.

Plan Organization

This document is divided into ten chapters and a separate Technical Appendix. The title and focus of each chapter is summarized below:

- *Chapter 1: Summary* – This chapter provides a brief overview of the plan recommendations and presents the estimated funding needed to implement it.
- *Chapter 2: Goals and Policies* – This chapter presents the goals and policies related to transportation for adoption into the City's Comprehensive Plan.
- *Chapter 3: Existing Conditions* – This chapter examines the current transportation system in terms of the built facilities, how well they perform and comply with existing policies, and where outstanding deficiencies exist.
- *Chapter 4: Land Use Forecasts and Travel Demands* – This chapter presents the details of how the City of Sherwood is expected to grow under its present Comprehensive Plan over the next 20 years, and how travel demands on the city and regional facilities will change from general growth in the Metro and nearby areas. This includes new UGB areas that have recently been added to the city's 20 year planning area.
- *Chapter 5: Pedestrian Plan* – This chapter presents strategies and plan recommendations to enhance pedestrian facilities and focus new improvements in areas with the highest concentration of activity.
- *Chapter 6: Bicycle Plan* – This chapter presents strategies and plan recommendations to enhance bicycle facilities and focus new improvements in areas with the highest concentration of activity.
- *Chapter 7: Transit* – This chapter makes recommendations to be considered by TriMet in their future enhancements to transit services. Also, implementation issues related to site development applications and improving access to transit services is discussed.
- *Chapter 8: Motor Vehicles* – This chapter presents strategies and plan recommendations to provide adequate mobility and access to the city, county and state facilities as travel demands grow to 2020 levels. This chapter also recommends new street design standards, access spacing standards, functional class designations, and other programs to monitor and manage travel demand.
- *Chapter 9: Other Modes* – This chapter discusses transportation issues related to rail, air, water, and pipeline transportation.
- *Chapter 10: Financing and Implementation* – This chapter presents the complete estimated revenues and costs for the transportation projects and programs developed in the plan. New funding alternatives are presented to bridge the gaps between the two.

Goals and Policies

The city's Comprehensive Plan lays out a policy framework regarding transportation services. The goals and polices pertaining to Transportation are presented in Chapter 2. Goals are defined as brief guiding statements that describe a desired result. Policies associated with each of the individual goals describe the actions needed to move the community in the direction of completing each goal. These goals and policies were applied in the development of this Transportation System Plan to develop strategies and implementing measures for each of the travel modes applied in the City of Sherwood.

Other Implementing Land Use Actions

Several recommendations are made regarding implementing the pedestrian, bicycle, and transit Master Plans during application development review periods. These are explained in detail in the Pedestrian Plan (Chapter 5), Bicycle Plan (Chapter 6) and Transit Plan (Chapter 7), and summarized briefly below:

- Pedestrian Facilities In-Fill –A City program could be developed either funded by the City or matching funds provided by the City to provide sidewalks in areas of the City where gaps occur in the system. This would affect primarily older parts of Sherwood such as downtown and neighborhoods to the east.
- Bicycle Facilities – The current city zoning code recommends provisions for bike parking facilities for many uses. It does not presently require these provisions. The zoning code be amended to require the bicycle provisions it currently recommends.
- Transit Facilities – The city's development code (or zoning code) could be amended to require a review of the proposed site's propensity to generate transit trips. Developments above a defined threshold could be required to accommodate and/or construct transit related improvements such as bus shelters, bus turnouts, or connecting pathways.

Projects and Programs

Pedestrian

Detailed analysis was conducted on existing collector and arterial streets to identify locations where new or in-fill facilities would be required. Separate recommendations were made for enhancements to existing crossings at key arterial locations. Key findings and recommendations included:

- Establishing new Pedestrian Districts in the Downtown Overlay Area and Six Corners Town Center areas. The Pedestrian District will have new standards for enhanced pedestrian connectivity and street crossings.
- Identifying a toolbox of improvements that can be applied for pedestrian crossing enhancements including raised center refuge islands, pedestrian countdown timers at traffic signals, and curb extensions where on-street parking is provided (or planned).
- Identifying a series of sidewalk in-fill projects (Pedestrian Action Plan) to connect existing sidewalks to key major pedestrian generators, such as schools, government facilities, etc.
- Modifying street standards to setback sidewalks from the curb (e.g., landscape strip) on all facilities. A landscaped (or hardscaped) buffer of six feet is recommended between sidewalks and the street curb in these cases. Also, modify standards to eight feet in residential areas.

The total cost of the Pedestrian Action plan: .... $2.3 million

Bicycle

A Bicycle Master Plan was developed to provide bicycle access to all areas of the City, particularly key destinations. Key findings and recommendations included:

- Providing for key north-south and east-west routes to connect residential neighborhoods to employment centers, transit centers, and regional trail facilities.
- Identifying program costs to expand arterial streets to provide on-street bike facilities (or off-street trails).
- As re-development and street improvements occur, provide sufficient space for on-street bike facilities where identified on the Bicycle Master Plan map.

The total cost of the Bicycle Action plan: .... $7.3 million

The Bicycle Action Plan has a significant cost to implement bicycle facilities on major roadways within the city. Past decisions about city street design standards excluded bike lanes on collector and arterial routes, and much of the recent construction, within the last ten years, have been built without these facilities the required right-of-way to be add them later. This past policy and street design standard will be modified with this TSP update to provide for these facilities, and make Sherwood consistent with statewide planning standards.

A major portion of the $7 million cost is related to retro-fitting substandard street sections to comply with the new standard created by this plan. The primary purpose for these projects is to provide a safe and convenient route for bicycle travel along major routes in the city. It is acknowledged that this will occur only as property re-develops, or when the city undertakes a major new improvement project on a designated street.

Transit

A number of strategies were reviewed including increased fixed-route bus services and extended transit services between Sherwood and Tualatin. However, based on input from TriMet, any service improvements beyond what TriMet is already planning would likely require alternative services and funding sources such as local shuttle services and/or vanpools or phasing of local service capital projects within the Sherwood service area in partnership with TriMet. Joint funding through intergovernmental agreements or other mechanisms would likely be necessary since local service is low on TriMet's priority list.

Additional costs for new and expanded services have not been determined.

Motor Vehicle

A comprehensive analysis of the 2020 motor vehicle needs for city streets and affected state highway facilities was performed within the City of Sherwood. Some of the new facilities required to serve 2020 travel demand were previously in Metro's *RTP*, Washington County's *Transportation System Plan*, and the City's *Capital Improvement Plan*. All of these projects were found to be important to maintain mobility standards for city and state facilities. A few key findings and recommendations from the Motor Vehicle chapter are summarized below:

- Tualatin-Sherwood Road will continue to function at an acceptable level of service in 2020 with its current three-lane geometry, as long as Adams Street is constructed between Pine Street and Tualatin-Sherwood Road. However, the intersection at ORE 99W/Tualatin-Sherwood Road is borderline in 2020 (i.e. very close to ODOT's maximum congestion threshold). A five-lane section would be preferable from east City Limits to Borchers Drive for optimum performance.
- Adams Street would need to be constructed between Pine Street and Tualatin-Sherwood Road in order for Tualatin-Sherwood Road to function acceptably in 2020.
- A number of "traffic control enhancement" projects will be necessary by 2020. These are locations where existing traffic control (typically stop signs) will be insufficient to handle the projected traffic volumes. Opportunities and constraints should be evaluated at each of these locations to determine the appropriate traffic control measure (i.e. traffic signal, roundabout, etc.).
- A number of local, neighborhood and collector street connections should be made, either as development occurs or funding is available. While some of these are essential to circulation and operations (i.e. Adams Street), others would be desirable to improve

circulation and connectivity.

- The "Downtown Streets Plan" should be implemented. This realigns the existing Oregon Street on the south side of the railroad track (eliminating an at-grade crossing), extends Pine Street over the track (adding an at-grade crossing) and eliminates the Washington Street at-grade crossing. A preliminary plan has been developed for traffic and it has been determined that no streets in the downtown area will require a center turn lane. A special street cross-section has been developed downtown that emphasizes the shared use of the roadway between pedestrians, bicycles and motor vehicles.

The motor vehicle projects for the City of Sherwood total: .... $36.9 million

Several elements of the road system will require further study to determine the preferred solution, and the above cost total for the city funds required would increase accordingly. Many of these roadways are owned and maintained by Washington County or ODOT (e.g., Oregon Street, Elwert Road, Kruger Road), and will require on-going coordination between planning and engineering to find solutions that are supportable by all the affected agencies.

Transportation Programs

Table 1-1 summarizes the elements of the plan that were not specifically defined in the project lists, and explains how costs will be addressed for these elements.

Table 1-1: Non-Auto, Pedestrian and Bicycle Costs Issues

Travel Mode	Issues
Parking	The Transportation System Plan does not define specific projects. Private property owners will provide off-street parking as land develops.
Neighborhood Traffic Management (NTM)	Specific NTM projects are not defined. These projects will be subject to neighborhood consensus based upon City 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 has no allocation for NTM in the current budget.
Public Transportation	TriMet will continue to develop costs for implementing transit related improvements. The Cities can supplement this by incorporating transit features through development exactions and roadway project design. Developing new transit services in Sherwood will require TriMet to reallocate funding or seek additional sources of operating funds.
Trucks/Freight	Roadway funding will address these needs.
Rail	Costs to be addressed and funded by private railroad companies and the state.
Air, Water, Pipeline	Not required by the City
Transportation Demand Management	Not required by the City

Financing

Table 1-2 summarizes the costs outlined in the Transportation System Plan to implement the Action Plans for Pedestrian, Bicycles, and Motor Vehicles elements, and several other transportation programs (see Table 10-3 for details) that support the transportation goals and policies identified in the TSP update. The 20-year cost is estimated at $64.2 million for the city funded portion of the identified projects.

Table 1-2: Sherwood Transportation Action Plans Costs over 20 years (2003 Dollars)

Transportation Element	Approximate Cost ($1,000)
Street Improvement Projects: Unfunded Action Plan	$36,900
Road Maintenance ($725,000/yr)	$14,500
Bicycle Action Plan	$7,300
Pedestrian Action Plan	$2,300
Pedestrian/School Safety Program ($10,000/yr)	$200
Sidewalk Grant Program ($50,000/yr)	$1,000
Neighborhood Traffic Management ($75,000/yr)	$1,500
Transportation System Plan Support Documents (i.e. Design standard update, TSP updates)	$500
20 YEAR TOTAL in 2004 Dollars	$64,200

Several additional transportation projects have yet to be defined because they require further study to closely examine the design trade-offs of particular solutions. There are listed in Chapter 8, in Table 8-10, and include intersection solutions for Sherwood Blvd. / Langer Dr., Oregon St. / Tonquin Road, and Elwert Road – Kruger Road at Highway 99W. Once these projects have been selected, the share of the costs contributed by the city, if any, would be added to the above totals in Table 1-2.

2. Goals and Policies

Background

This chapter summarizes the new transportation policies for the City of Sherwood. The new policies respond to adopted goals and policies from the Regional Transportation System Plan and Washington County Transportation System Plan.

Sherwood Comprehensive Plan

The Transportation Element of the Sherwood Comprehensive Plan resides in Part 2, Chapter 6 of the plan. The document has been reviewed and the following organizational problems have been noted:

- Inconsistent organization and use of language for plan goals, policies, and strategies;
- A significant number of technical standards are located in the comprehensive plan;
- Awkward organization for some topics with related policies and strategies scattered in the document; and
- Required elements are not addressed in the plan per state and regional planning requirements.

To remedy these problems, the Transportation Element of the Sherwood Comprehensive Plan will be reorganized. The document would primarily function as a policy document. Goals, policies and strategies would be grouped by topic. Most standards and implementing procedures will be removed from the plan. Two important lists remain in the plan: the functional classification definitions and map, and a list of major transportation system improvements. The Comprehensive Plan would reference several important supporting documents that would augment and/or implement it. These include:

- Sherwood Transportation System Plan – This document would be adopted by reference as part of the Comprehensive Plan, but would function as a separate technical document and reference manual;
- Sherwood Development Code – Most technical standards would be removed from the comprehensive plan and placed in the development code; and
- Sherwood Public Works Standards – Public works technical standards are often listed in a separate manual. There are differences of opinion about the need to codify this type of manual, which frequently includes street and utility dimensional standards and construction specifications for public infrastructure that is constructed by private interests.

The City's Comprehensive Plan Part 2 lays out a policy framework regarding transportation services. Goals are defined as brief guiding statements that describe a desired result. Policies and strategies are associated with each of the goals and describe how to move the community in the direction of completing each goal. The policy element of the plan would generally be organized as follows:

- Goal Statement - A statement that describes an ideal condition that the city desires to attain over time for various aspects of the transportation system. E.G. Provide access to safe, affordable and reliable transportation choices for all Sherwood residents and businesses;
- Policy Statements – One or more statements that are intended to help define positions, requirements, or rules that the city will use to achieve the goal; and
- Strategy statements – One or more statements that are intended to outline specific action steps that will be taken to achieve a policy or goal.

The following summarizes the transportation policies and strategies. They are based on the City's Vision Statement, but updated as described previously. It includes specific language for modified and/or new policies that are in response to local, regional or state regulations, such as the state Transportation Planning Rule and portions of the Metro Functional Plan. The Appendix includes a memorandum summarizing the changes that were made to the existing goals and policies.

Goals and Policies

Goal 1: Provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes serving all neighborhoods and businesses.

Policy 1 – The City will ensure that public roads and streets are planned to provide safe, convenient, efficient and economic movement of persons, goods and services between and within the major land use activities. Existing rights of way shall be classified and improved and new streets built based on the type, origin, destination and volume of current and future traffic.

Policy 2 – Through traffic shall be provided with routes that do not congest local streets and impact residential areas. Outside traffic destined for Sherwood business and industrial areas shall have convenient and efficient access to commercial and industrial areas without the need to use residential streets.

Policy 3 – Local traffic routes within Sherwood shall be planned to provide convenient circulation between home, school, work, recreation and shopping. Convenient access to major out-of-town routes shall be provided from all areas of the city.

Policy 4 – The City shall encourage the use of more energy-efficient and environmentally-sound alternatives to the automobile by:

- The designation and construction of bike paths and pedestrian ways;
- The scheduling and routing of existing mass transit systems and the development of new systems to meet local resident needs; and
- Encouraging the development of self-contained neighborhoods, providing a wide range of land use activities within a single area.

Policy 5 — The City shall work cooperatively with the Port of Portland and local governments in the region to ensure sufficient air and marine passenger access for Sherwood residents.

Policy 6 – The City shall work to ensure the transportation system is developed in a manner consistent with state and federal standards for the protection of air, land and water quality, including the State Implementation Plan for complying with the Clean Air Act and the Clean Water Act.

Policy 7 – The City of Sherwood shall foster transportation services to the transportation-disadvantaged including the young, elderly, handicapped, and poor.

Policy 8 – The City of Sherwood shall consider infrastructure improvements with the least impact to the environment.

Policy 9 – The City of Sherwood shall develop a transportation demand management program to complement investments in infrastructure (Supply).

Strategies

1. Make traffic safety a continuing effort through effective law enforcement and educational programs.
2. Adopt an acceptable level of service for the roadway network that is consistent with regional transportation policies.
3. Develop an array of transportation assets and services to meet the needs of the transportation-disadvantaged.
4. Evaluate, identify, and map existing and future neighborhoods for potential small scale commercial businesses to primarily serve local residents.
5. Adopt a strategy for reducing impacts of impervious surfaces to stormwater management.
6. Identify and adopt a transportation demand management strategy to provide incentives to employers who develop transportation options for employees.

Goal 2: Develop a transportation system that is consistent with the City's adopted comprehensive land use plan and with the adopted plans of state, local, and regional jurisdictions.

Policy 1 – The City shall implement the transportation plan based on the functional classification of streets shown in Figure 8-1.

Policy 2 – The City shall maintain a transportation plan map that shows the functional classification of all streets within the Sherwood urban growth area. Changes to the functional classification of streets must be approved through an amendment to the Sherwood Comprehensive Plan, Part 2, Chapter 6 - Transportation Element.

Policy 3 – The Sherwood transportation system plan shall be consistent with the city's adopted land use plan and with transportation plans and policies of other local jurisdictions, especially Washington County, Clackamas County, City of Wilsonville, and the City of Tualatin.

Policy 4 – The City will coordinate with Metro regarding implementation of the Regional Transportation Plan and related transportation sections of the Metro Functional Plan.

Policy 5 – The City shall adopt a street classification system that is compatible with Washington County Functional Classification System for areas inside the Washington County Urban Area Plan and with Washington County 2020 Transportation Plan (Ordinance 588).

Policy 6 — The City will work with Metro and other regional transportation partners to implement regional transportation demand management programs where appropriate.

Policy 7 – The City shall work cooperatively with the Port of Portland and local governments in the region to ensure sufficient air and marine passenger access for Sherwood residents.

Policy 8 - Establish local non-Single Occupant Vehicle (SOV) modal targets, subject to new data and methodology made available to local governments, for all relevant design types identified in the RTP. Targets must meet or exceed the regional modal targets for the 2040 Growth Concept land use design types as illustrated in the following table:

2040 Regional Modal Targets
Non-single Occupancy Vehicles

2040 Design Type	Modal Target
Regional centers Town centers Main streets Station communities Corridors	45 to 55 percent
Industrial areas Employment areas Inner neighborhoods Outer neighborhoods	40 to 45 percent

Strategies

1. Develop an intergovernmental agreement between Sherwood, Washington County and the City of Tualatin, consistent with ORS 195.065, to establish urban service boundaries and responsibilities for transportation facilities within and adjacent to the City of Sherwood.
2. Work cooperatively with ODOT, Washington County, and Metro to develop an interchange area management plan for the Pacific Highway 99W and Tualatin-Sherwood Highway intersection.
3. Work cooperatively with ODOT, Metro, Washington County, and Tualatin to develop a corridor management plan for Pacific Highway 99-W and Tualatin-Sherwood Road to preserve existing access to the highway for the city's arterial and collector streets.
4. Participate in regional planning efforts, including the development of the Regional Transportation Plan (RTP), to secure funding for safety and capacity improvements to the City of Sherwood's arterial and collector street system that are necessary to maintain acceptable levels of service for local and through traffic.
5. Define transportation corridors in advance through long range planning efforts
6. Coordinate the transportation network with adjacent governmental agencies, such as Washington County, Metro, and the State. Coordinate with ODOT in implementing their Six-Year Plan and the State Highway Improvement Program.

Goal 3: Establish a clear and objective set of transportation design and development regulations that addresses all elements of the city transportation system and that promote access to and utilization of a multi-modal transportation system.

Policy 1 – The City of Sherwood shall adopt requirements for land development that mitigate the adverse traffic impacts and ensure all new development contributes a fair share toward on-site and off-site transportation system improvement remedies.

Policy 2 – The City of Sherwood shall require dedication of land for future streets when development is approved. The property developer shall be required to make street improvements for their portion of the street commensurate with the proportional benefit that the improvement provides the development.

Policy 3 – The City of Sherwood shall require applicable developments (as defined in the development code), to prepare a traffic impact analysis.

Policy 4 – The City of Sherwood shall adopt a uniform set of design guidelines that provide one or more typical cross section associated with each functional street classification. For example, the City may allow for a standard roadway cross-section and a boulevard cross-section for arterial and collector streets.

Policy 5 – The City shall adopt roadway design guidelines and standards that ensure sufficient right-of-way is provided for necessary roadway, bikeway, and pedestrian improvements.

Policy 6 – The City shall adopt roadway design guidelines and standards that ensure sidewalks and bikeways be provided on all arterial and collector streets for the safe and efficient movement of pedestrians and bicyclists between residential areas, schools, employment, commercial and recreational areas.

Policy 7 – The City of Sherwood will generally favor granting property access from the street with the lowest functional classification, including alleys. Additional access to arterials and collectors for single family units shall be prohibited and use access from frontage roads and local streets. Frontage roads shall be designed as local streets.

Policy 8: The City will adopt access control and spacing standards for all arterial and collector streets to improve safety and promote efficient through street movement. Access control measures shall be generally consistent with Washington County access guidelines to ensure consistency on city and county roads.

Policy 9 - The City will establish guidelines and standards for the use of medians and islands for regulating access and providing pedestrian refuge on arterial and collector streets.

Policy 10 - The City will develop uniform traffic control device standards (signs, signals, and pavement markings) and uniformly apply them throughout the city.

Policy 11 - The City of Sherwood will adopt parking control regulations for streets as needed. On-street parking shall not be permitted on any street designated as an arterial, unless allowed by special provision within the Town Center (Old Town) area or through the road modifications process outlined in the Sherwood Development Code.

Policy 12 – The City of Sherwood shall adopt new development codes to fill in gaps in existing sidewalks to achieve a consistent pedestrian system.

Strategies

1. Incorporate typical street cross section guidelines in the City's public works design standards that address vehicular, bicycle, pedestrian, and transit needs.
2. Include a Road Modification Process in the Sherwood Development Code to provide a procedure for granting variances from street design standards for parking, pedestrian facilities, signals, and other roadway features.
3. Consider the Metro 2040 Plan Regional Street Design Elements when planning for improvements to City transportation facilities, including those built by ODOT or Tri Met.
4. Incorporate guidelines in the City's development code that establish when a local street refinement plan must be prepared and the process for preparing such a plan.
5. Amend the city development code as necessary to regulate vehicular access, spacing, circulation, and parking consistent with plan policies.

6. Amend the city development code as necessary to include specific guidelines for determining the proportional benefit contribution associated with requirements for street dedication and the construction of off-site transportation improvements.
7. Amend the development code to include standards and procedures for a transportation impact analysis (TIA). Refer to Appendix for example.
8. Develop a list to prioritize refinement plan needs, such as corridor plans and interchange area management plans.
9. Amend development code to include provisions for implementing traffic calming mechanisms.
10. Create a map that identifies locations targeted for on-street parking, such as in neighborhood commercial areas and the town center that support multi-modal options.
11. Regularly update the development code to ensure consistency with regional parking requirements.
12. Develop a "conceptual new streets plan" map for all contiguous areas of vacant and redevelopable parcels of 5 (five) or more acres planned or zoned for residential or mixed-use development, and adopt the map as part of the TSP.
13. Consider a "mixed-use" overlay zone in the development code that will apply to the Six Corners area. Include design standards that will encourage a vibrant, pedestrian friendly environment through the implementation of boulevards, medians, mixed-use development and site design.

Goal 4: Develop complementary infrastructure for bicycles and pedestrian facilities to provide a diverse range of transportation choices for city residents.

Policy 1 – The City of Sherwood shall provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes.

Policy 2 – Sidewalks and bikeways shall be provided on all arterial and collector streets for the safe and efficient movement of pedestrians and bicyclists between residential areas, schools, employment, commercial and recreational areas.

Policy 3 – The City of Sherwood will pursue development of local and regional pedestrian trail facilities, especially a trail system connection between the city and the Tualatin National Wildlife Refuge.

Policy 4—The City of Sherwood shall provide design standards for roadway traffic calming features such as traffic circles, curb extensions, bulb-outs, and speed humps.

Policy 5 – The City of Sherwood shall include requirements for the provision of bicycle parking on large commercial, industrial, and multi-family residential projects.

Policy 6 – The City of Sherwood will coordinate the bikeway system with adjacent jurisdictions, especially Tualatin, Wilsonville, Clackamas and Washington County.

Policy 7 – The City will work to eliminate architectural barriers from buildings and public improvements, which limit elderly and handicapped use of the transportation system.

Strategies

1. Include pedestrian and bike projects in the capital improvement plan to ensure

investment in alternative modes;

2. Use intergovernmental agreements with Tualatin and Washington County for the coordination of urban services per ORS 196.065 to coordinate the bikeway system and trail system;
3. Include design standards for sidewalk and bikeway facilities in the city's roadway design guidelines;
4. Include provisions for planning the location of pedestrian and bike routes for connecting residential, school, commercial, employment and recreational areas in the development code guidelines for preparing local street refinement plans;
5. Include a system of bikeways along collector and arterial roadways as illustrated on the Transportation Plan Map;
6. Include requirements in the development code for private development to provide bike and pedestrian facilities as indicated on the Transportation Plan Map;
7. Include design standards for sidewalks and bicycle facilities in the city's roadway design guidelines;
8. Pursue traffic calming techniques for neighborhood and local streets so as to provide safe passage for pedestrians and bicyclists, and a more pleasant neighborhood environment for residents.
9. Construct and install infrastructure, including storm drain inlets, which are pedestrian and bicycle-friendly.

Goal 5: Provide reliable convenient transit service to Sherwood residents and businesses as well as special transit options for the city's elderly and disabled residents.

Policy 1 – Public transportation shall be provided as an alternative means of transportation in Sherwood.

Policy 2 – The City of Sherwood will work with TriMet to expand transit services to all parts of the City through additional routes, more frequent service, and transit oriented street improvements.

Policy 3 – Park-and-ride facilities should be located with convenient access to the arterial system to facilitate rider transfer to transit and car pools.

Policy 4 – Encourage the construction of bus shelters and park-n-ride lots in the vicinity of planned transit corridors.

Policy 5 – The City of Sherwood will support the establishment of a "feeder" transit route from Sherwood to Tualatin employment centers.

Policy 6 – The City of Sherwood will support park and ride facilities that are sited for the maximum convenience of commuters and transit riders.

Policy 7—The City of Sherwood will support regional efforts for the preservation and development of appropriate rail rights-of-way for passenger rail service, in particular for serving local and regional commuter rail needs in Washington County, Clackamas County, and Yamhill County.

Policy 8 – The City of Sherwood will encourage the provision of special transportation services (i.e., van pools, or car pools, dial-a-ride, etc.) to transportation disadvantaged by TriMet and community-based service providers.

Policy 9 – Fully integrate the City into the regional transit system by expanding hours and destinations served by transit providers.

Policy 10 – The City will meet RTP goals of providing a safe and convenient pedestrian circulation system.

Strategies

1. Develop design standards to separate buses from the arterial roadway while transferring passengers. Establish a bus turnout design for stops on arterial streets.
2. Update development code to include design guidelines that require transit stops to be accessible to transit riders, especially the elderly and handicapped.
3. Amend development code to require development on sites at major transit stops (defined by the City of Sherwood) to do the following:
   - Locate within 20 feet of (or provide a pedestrian plaza) at the major transit stop;
   - Provide reasonably direct pedestrian connections between the transit stop and building entrances on the site;
   - Provide a transit service passenger landing pad accessible to disabled persons;
   - Provide an easement or right-of-way dedication for a passenger shelter and underground utility connection from the new development to the transit amenity if requested by the public transit provider; and
   - Improve public safety by providing lighting at transit stops.
4. Work with Tri-Met and Metro to extend transit options to Sherwood, which may include:
   - High capacity transit service along 99W terminating near Six Corners;
   - Potential extension of commuter rail line from Lake Oswego to Sherwood on the existing rail line with service to Newberg or McMinnville; and
   - Other regional transit service connections, such as frequent bus, interurban bus, as appropriate.

Goal 6: Provide a convenient and safe transportation network within the Sherwood Town Center (Old Town) and Six Corners area that enables mixed use development and provides multi-modal access to area businesses and residents.

Policy 1 – The City of Sherwood shall continue to refine and develop existing and new design guidelines and special standards for the Town Center and Six Corners areas to facilitate more pedestrian and transit friendly development.

Policy 2 – The City of Sherwood shall work to provide connectivity, via the off-street trail system and public right-of-way acquisitions and dedications, to better achieve street spacing and connectivity standards.

Strategies

1. Provide handicap ramps at all intersections with landings connected to sidewalk improvements, especially within Six Corners and Old Town areas.
2. Design transit stops in Six Corners and Old Town areas to meet ADA requirements for transit accessibility.

3. Adopt design and development guidelines for the Town Center areas that facilitate pedestrian use and a mix of commercial and residential development.
4. Adopt parking guidelines for the Town Center areas that are compatible with the parking guidelines established in Title 2 of the Metro Urban Growth Management Functional Plan.

Goal 7: Ensure that efficient and effective freight transportation infrastructure is developed and maintained to support local and regional economic expansion and diversification consistent with City economic plans and policies.

Policy 1—The City of Sherwood will collaborate with federal, state and neighboring local governments and private business to ensure the investment in transportation infrastructure and services deemed necessary by the City to meet current and future demand for industrial and commercial freight movement.

Policy 2—The City of Sherwood will adopt implementing regulations that provide for safe and convenient access to industrial and commercial areas for commercial vehicles, including freight loading and transfer facilities.

Policy 3—The City of Sherwood will work cooperatively with local, regional and state agencies to protect the viability of truck and freight service routes within, through, and around the City of Sherwood, especially for Pacific Highway 99-W, the Tualatin-Sherwood Highway, and the planned I-5/Hwy 99-W Connector corridor.

Policy 4—The City of Sherwood will work cooperatively with local, regional and state governments to ensure there is adequate air transportation infrastructure to serve local needs at regional airport facilities, including the Hillsboro Airport and Portland International airport.

Policy 5—The City of Sherwood will strongly encourage the preservation of rail rights-of-way for future rail uses, and will work with appropriate agencies to ensure the availability of rail services to its industrial lands.

Policy 6—The City of Sherwood will cooperate with local, regional and state governments to provide for regional marine freight infrastructure sufficient to serve local needs.

Policy 7—The City of Sherwood will cooperate with the Portland Development Commission, Port of Portland, Washington County, and other economic development agencies to ensure the availability of inter-modal connectivity facilities deemed necessary to facilitate seamless freight transfer between all transport modes.

<u>Strategies</u>

1. Revise the Sherwood Development Code as necessary to include clear and objective standards for the provision of freight loading and handling facilities, such as restricted on-street parking, loading docks, truck access ways, and rail spurs, in all industrial and commercial development districts.
2. Participate in regional economic development planning efforts related to inter-modal transportation facilities.
3. Adopt appropriate standards to ensure the preservation of rail access corridors to Sherwood's industrial land base.

Goal 8: The Sherwood transportation network will be managed in a manner that ensures the plan is implemented in a timely fashion and is kept up to date with respect to local and regional priorities.

Policy 1 – The City of Sherwood shall develop a systematic approach to implementing the transportation network.

Policy 2 – The City of Sherwood shall pursue a diversified funding strategy to implement the transportation system plan including private, public and regional sources.

Policy 3 – The City of Sherwood shall use its adopted capital improvement plan to prioritize and schedule transportation projects based upon need as shown in the Transportation System Plan. Incorporate the transportation system priorities from the TSP into the city's capital improvement planning process.

Policy 4 – Project scheduling shall be performed in a systematic manner based on the priority rating process outlined in the Transportation System Plan and available financial resources.

Policy 5 – The Transportation System Plan shall be periodically updated, preferably on a five-year cycle, to assure consistency with changing ideas, philosophies, and related policies.

<u>Strategies</u>

1. Participate in MPAC, JPACT and other Metro advisory bodies to promote Sherwood transportation system improvements.
2. Local private financing resources will include right of way dedication and developer contributions to street improvements, and local improvement districts. Public resources will include local system development charges and bonding authority. Regional sources will include Washington County Traffic Impact Fees (TIF) and projects bonded through the County MSTIP program. Regional sources will also include Metro Transportation Improvement Plan (MTIP) resources and other state and federal grant assistance programs.
3. Adopt a comprehensive local system development charge ordinance to either augment or replace CAP and collector street SDC.
4. Develop a method for scheduling improvement projects based on priority and funding sources.
5. Assign city staff and elected officials to participate in regional transportation planning processes.
6. Secure intergovernmental agreements between Sherwood and adjoining communities and regional service providers that outline cooperative measures for coordinating transportation investment and regulation per ORS 195.065.

3. Existing Conditions

Existing transportation conditions were evaluated as part of the City of Sherwood Transportation System Plan (TSP). This chapter summarizes existing traffic and transportation operation in the City. It considers all modes including pedestrians, bicycles, transit, motor vehicles, freight, water, air, and pipelines. In the spring of 2003, an inventory of traffic conditions in Sherwood was undertaken to establish a base year for the TSP. Much of this data provides a benchmark (basis of comparison) for future assessment of transportation performance in Sherwood relative to desired policies.

The study area for the TSP was expanded beyond the city limits and existing urban growth boundary (UGB) to respond to planning area agreements and potential future annexations. The updated study area is shown in Figure 3-1, which includes Metro's UGB expansion areas. Thirty-five intersections within the study area were selected for evaluation. Traffic data was gathered at these locations and analyzed in order to evaluate area traffic conditions including volumes and levels of service. In addition, regional transportation system inventories were utilized to map existing facilities. The following sections describe the existing systems, usage, and performance for the applicable travel modes in the City of Sherwood.

Pedestrians

Figure 3-2 shows the existing sidewalk inventory in Sherwood. Large portions of the arterial and collector streets in Sherwood have sidewalks on at least one side of the street. There are some locations where sidewalks are not connected; however, connectivity and pedestrian linkages are relatively good, in particularly to parks and schools. In addition, a majority of the residential streets are shown to have sidewalks on both sides of the street, providing connections to major roadways and other neighborhoods. There is no trail system identified within Sherwood that supports the sidewalk system. The TSP should consider multi-use path alignments to provide additional connections between neighborhoods and complete the pedestrian grid system.

DKS Associates
TRANSPORTATION SOLUTIONS

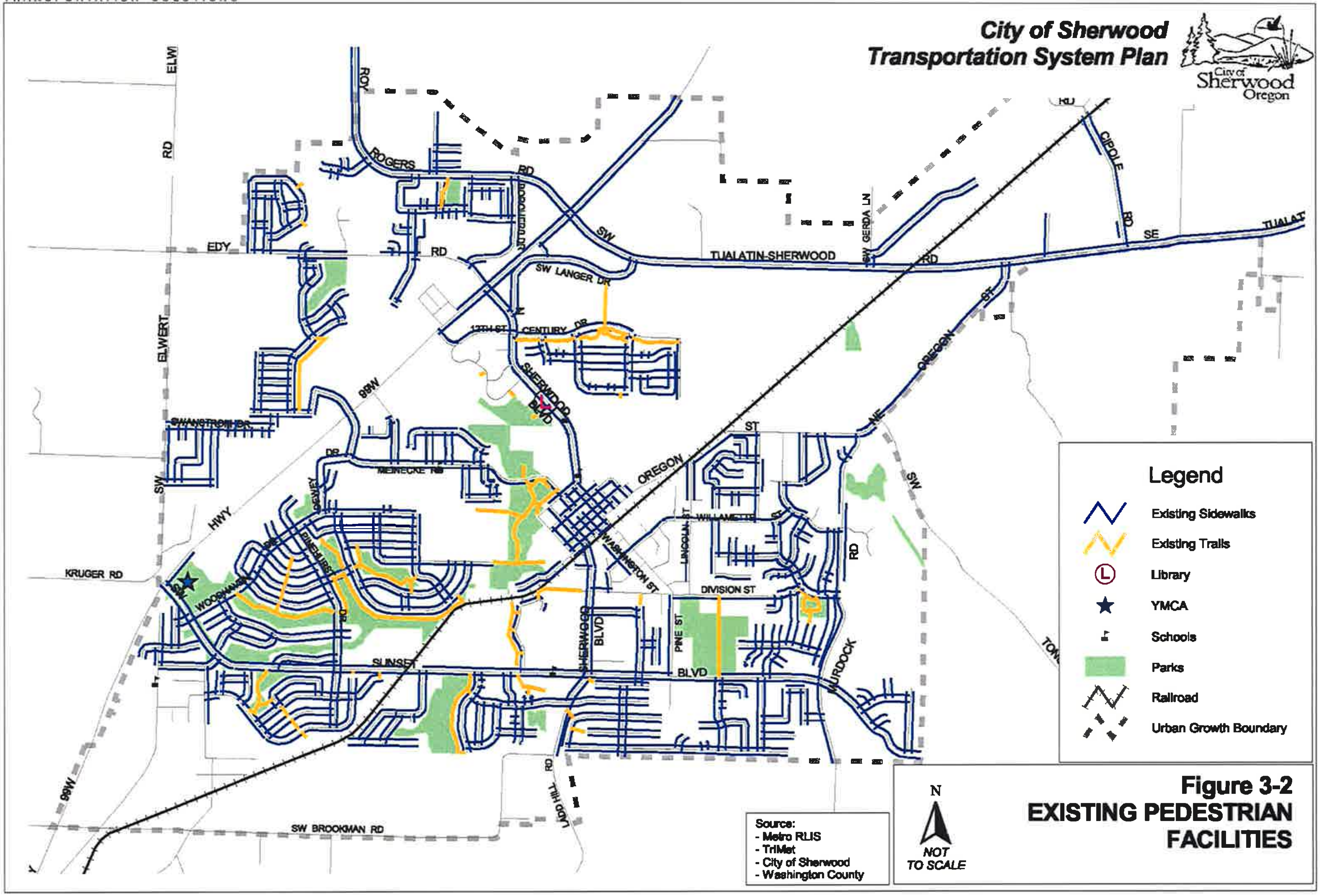

Figure 3-2
EXISTING PEDESTRIAN FACILITIES

Pedestrian crossing volumes at the study intersections were counted during the PM peak hour turn movement counts. The pedestrian crossing volumes are shown in Figure 3-3. The most significant pedestrian movements occur near retail, recreational, and transit areas, including Railroad Avenue, Sherwood Boulevard, Tualatin-Sherwood Road, and Sunset Boulevard. Along major roadways such as Highway 99W and Tualatin Sherwood Road, pedestrian crossings are limited to locations with traffic signal controls due to high motor vehicle volumes and speeds. Highway 99W has five signalized crossings providing pedestrian crossings along its three-mile length through the study area. The TSP should examine providing additional crossings and connections to the pedestrian system to improve crossing spacing along Highway 99W.

Bicycles

Figure 3-4 shows the existing bicycle facility inventory in Sherwood. Besides Highway 99W and Tualatin-Sherwood Road, most of the roadways in the study area do not provide bike lanes. The current City policy is to provide non-motorized facilities in an off-street path system. The existing bike lane system does not provide adequate connections from neighborhoods to schools, parks, retail centers, or transit stops. Cyclists desiring to travel through the City generally either share the roadway with motor vehicles on major streets or find alternate routes on lower volume local streets.

Bicycle counts were conducted during the evening peak period (4:00 to 6:00 PM) at the study intersections in Sherwood and are shown in Figure 3-5. The existing bicycle volumes are generally low and can be expected to increase in residential areas during the summer months.

Transit

Transit service is provided to Sherwood by the Tri-County Metropolitan District of Oregon (TriMet). The Link Bus Express also offers morning, afternoon and evening service from McMinnville to Sherwood, connecting to the TriMet bus system. Figure 3-6 shows current TriMet bus routes serving Sherwood, which includes routes 12, 94, and 95. These routes connect downtown Sherwood to Highway 99W and run to/from the north. Park and ride lots are provided downtown on Railroad Avenue and off of Tualatin-Sherwood Road at the Regal Cinemas parking lot. Table 3-1 lists the average routes headways and corresponding level of service (based on the *Highway Capacity Manual* methodology[1]) for each of the routes serving Sherwood.

[1] *2000 Highway Capacity Manual*, Transportation Research Board, 2000, Chapter 27.

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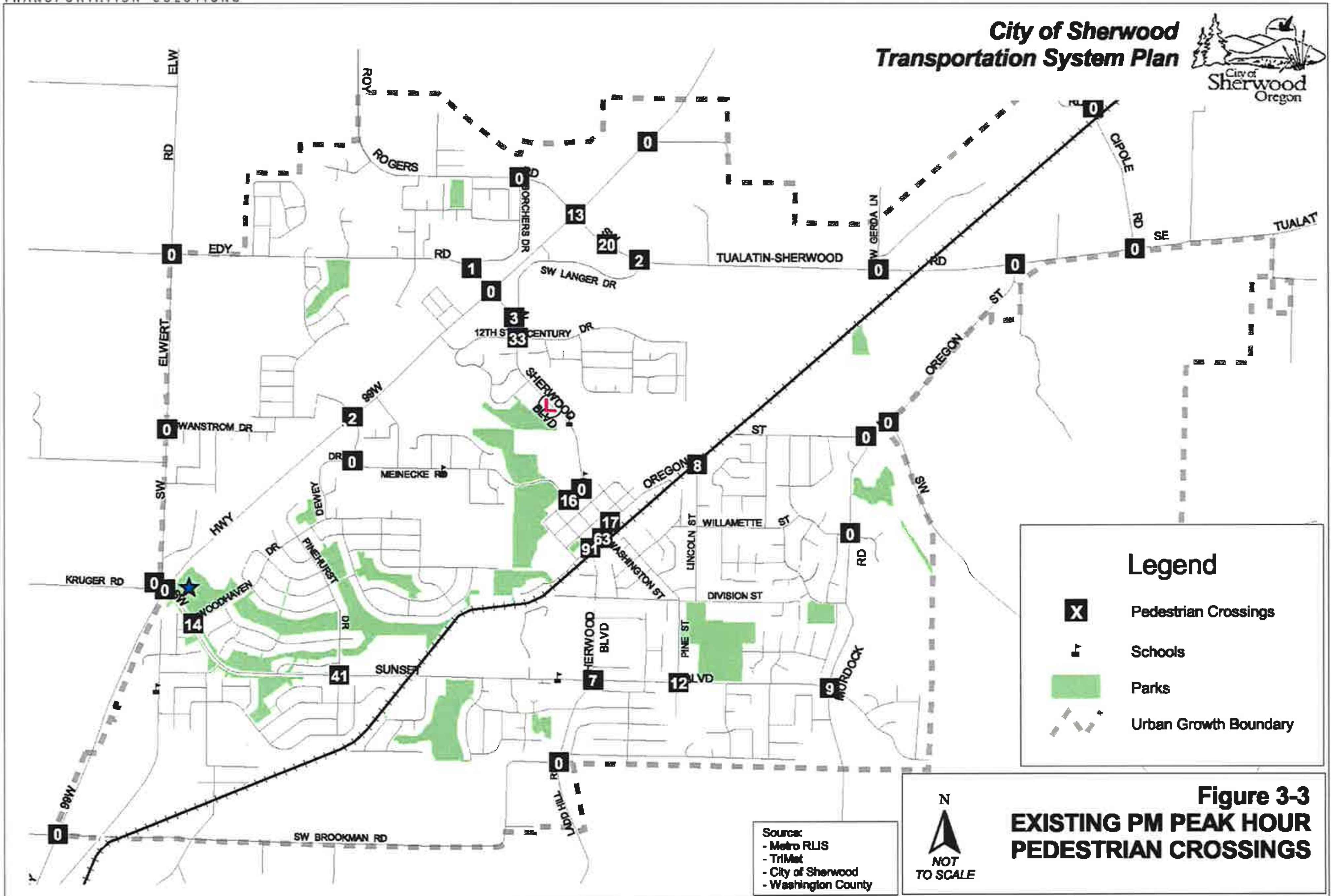

Figure 3-3
EXISTING PM PEAK HOUR PEDESTRIAN CROSSINGS

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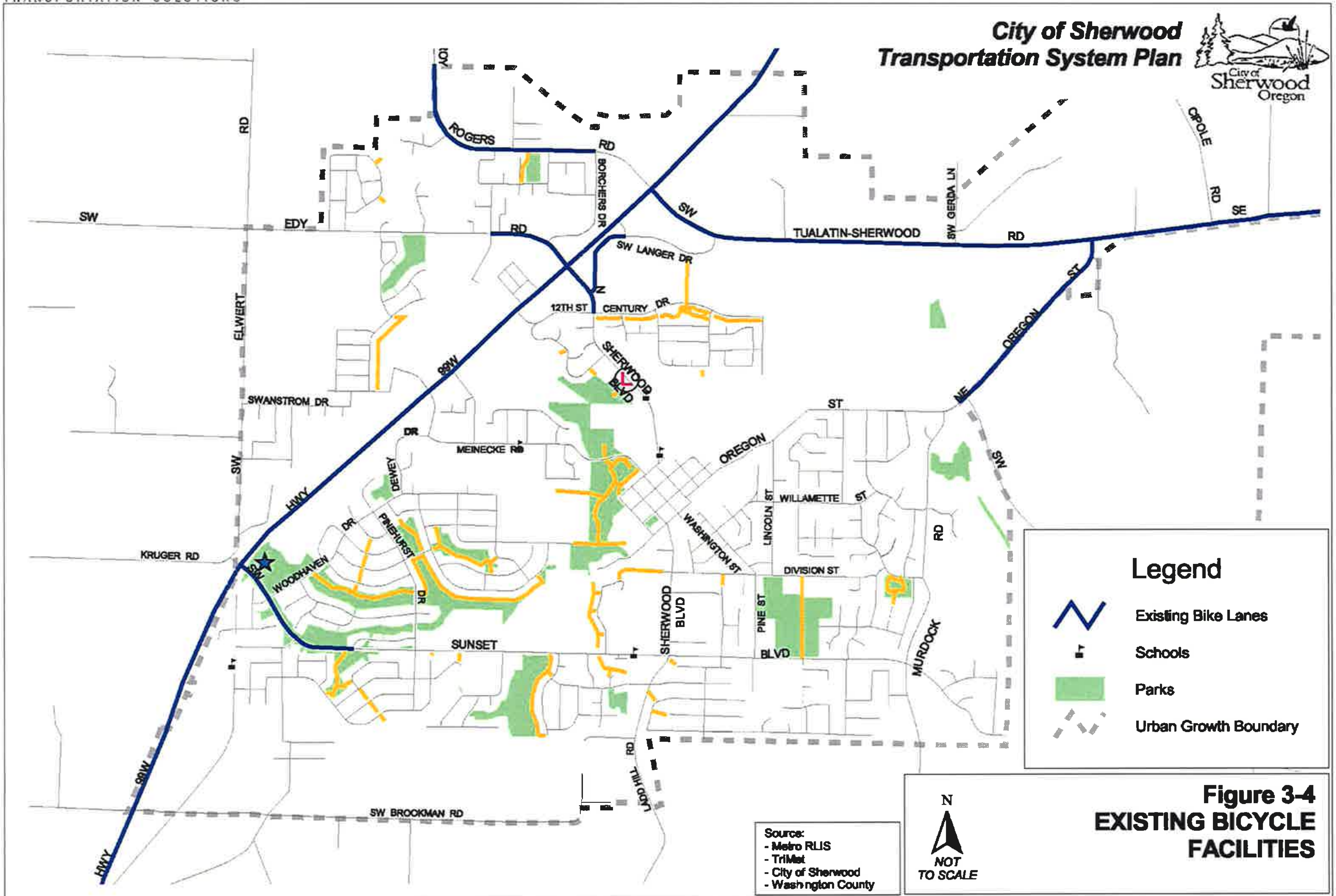

Figure 3-4
EXISTING BICYCLE FACILITIES

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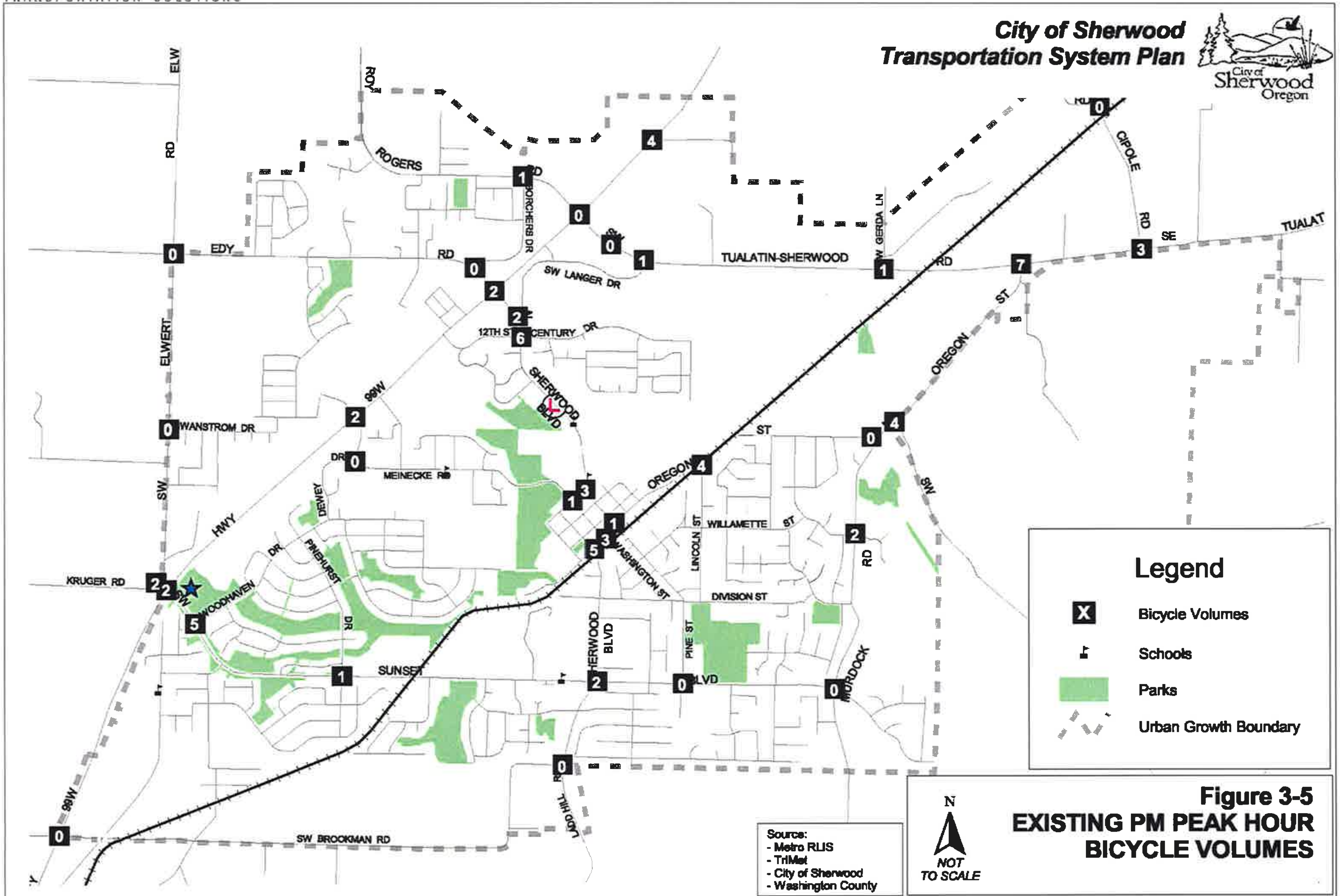

Figure 3-5
EXISTING PM PEAK HOUR BICYCLE VOLUMES

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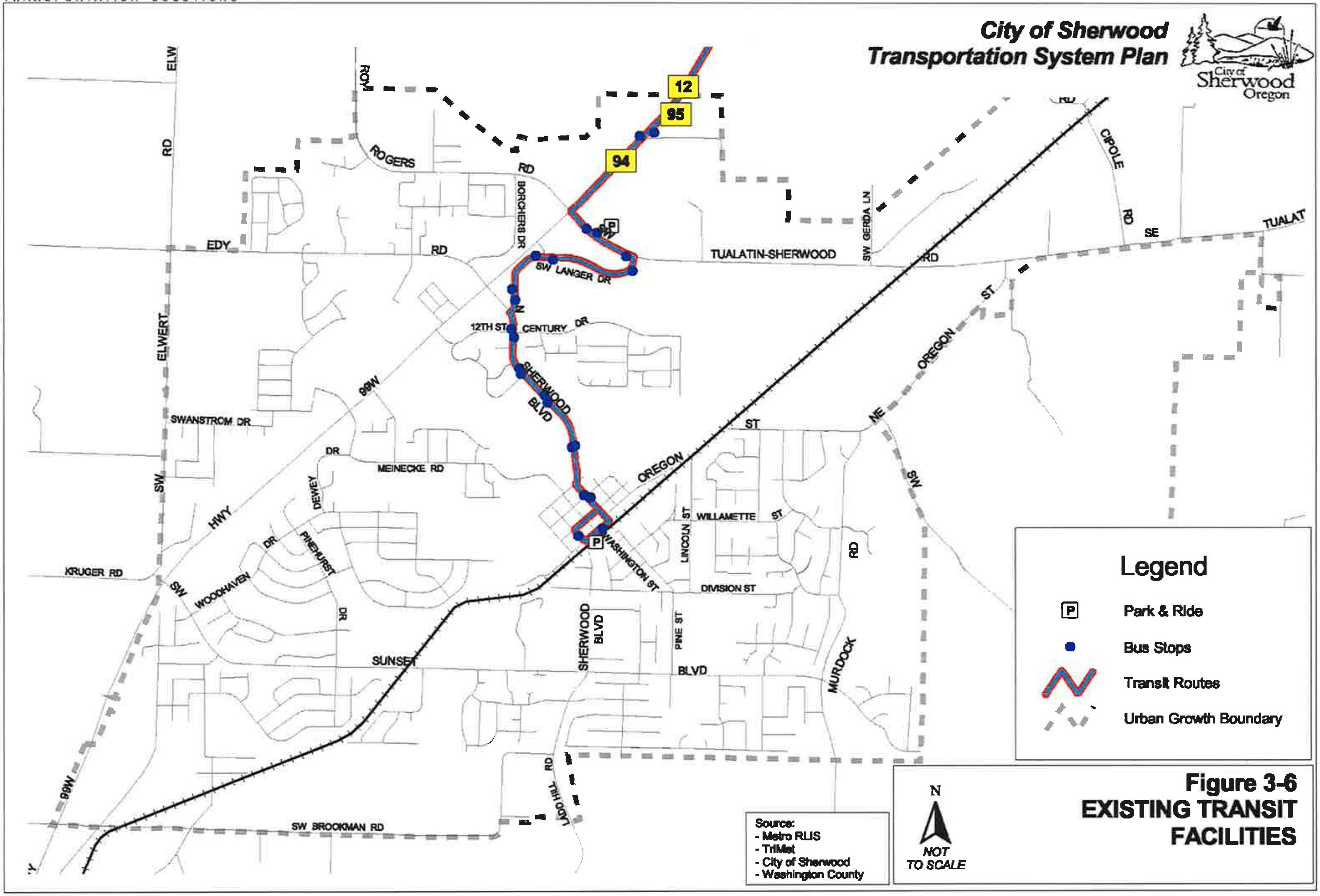


Figure 3-6
EXISTING TRANSIT FACILITIES

Table 3-1: TriMet Service Routes and Weekday Peak Period Level of Service

	Average Headways (minutes)			Level of Service		
Route	AM	Midday	PM	AM	Midday	PM
#12 Barbur Blvd	30	30	30	E	E	E
#94 Sherwood/Pac Hwy	15	>60	12	C	F	B
#95 Tigard/I-5 Express	30	>60	24	E	F	D

Note: AM Period = 06:00-08:30, Midday Period = 08:30-16:00, PM Period = 16:00-18:00
Level of Service (LOS) for transit service based on headway: less than 10 minutes = LOS A;
10-14 minutes = LOS B; 14-19 minutes = LOS C; 20-29 minutes = LOS D; 30-60 minutes = LOS E;
and greater than 60 minutes = LOS F.

In addition to the headway level of service measure, transit level of service can be analyzed based on area of coverage and route reliability. Transit coverage is based on comparing land that has a high enough density to support transit service versus a 1/4-mile walking distance buffer around transit stops. As land use details are complete for the travel demand forecasting for the TSP, transit coverage analysis will be added as a performance measure. Transit service reliability is primarily measured by the ability for buses to maintain schedules along corridors. Transit routes serving Sherwood depend on roadway operations to the north (Highway 99W in Tigard, I-5 north of Tigard, and Barbur Boulevard). Reliability in these areas is addressed by the Tigard TSP, the Washington County TSP, the Oregon Highway Plan, and the Regional Transportation Plan. Within Sherwood, this TSP should address transit reliability by maintaining adequate travel speeds and intersection operation along transit routes (this could include measures such as signal coordination and bus priority).

Weekday bus boarding information was received from TriMet and reflects the current fall 2002 census. Figure 3-7 shows the average weekday boardings at each transit stop. In addition, Figure 3-7 shows that the only existing transit shelter in Sherwood is located at the downtown Park and Ride. TriMet typically considers locating transit shelters at stops with 35 or more boardings per day[2]. The Tualatin-Sherwood Park and Ride transit stop is the only stop in Sherwood that currently meets the transit shelter requirement that does not have a shelter.

[2] *Design Criteria*, TriMet, August 2002.

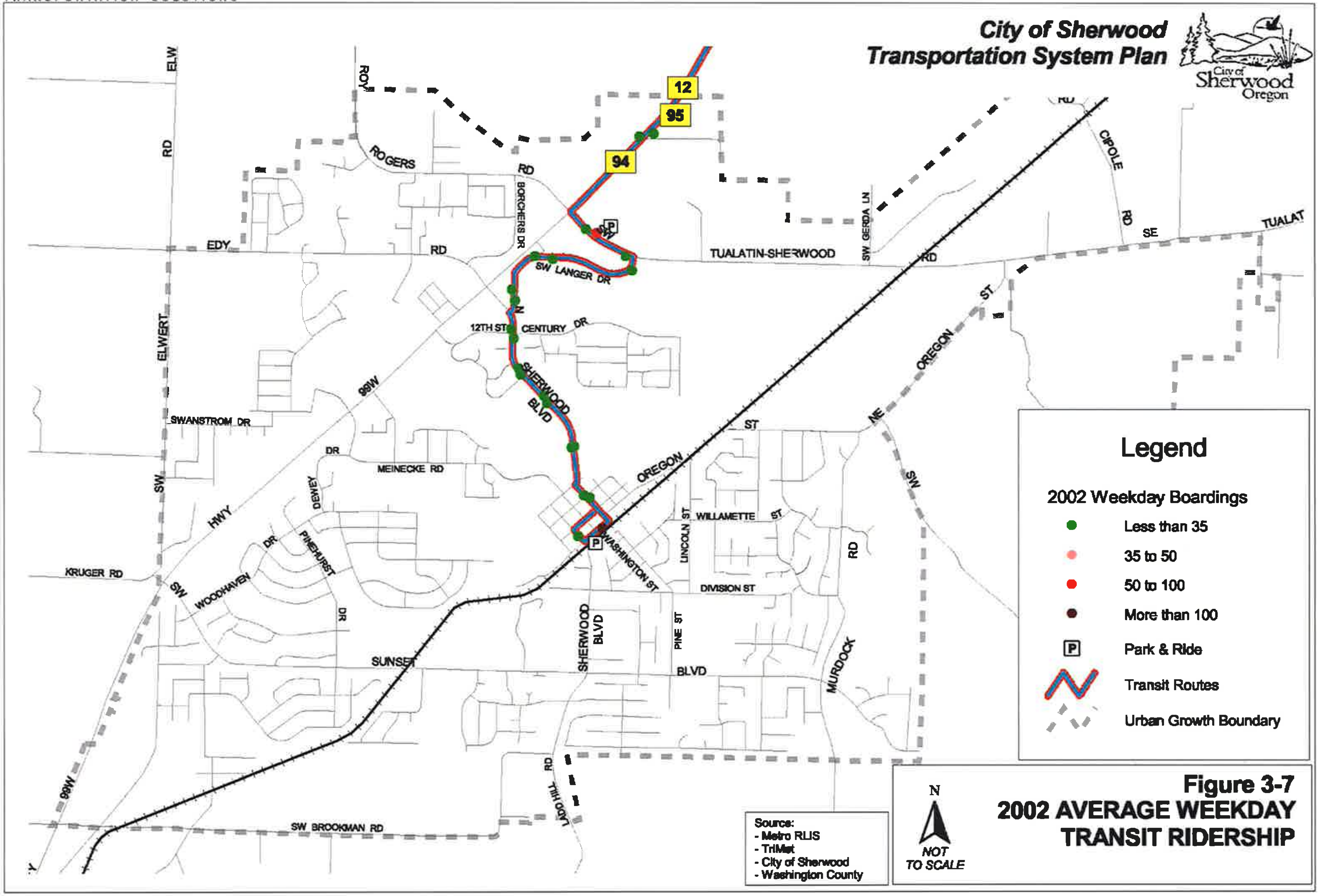


Figure 3-7
2002 AVERAGE WEEKDAY TRANSIT RIDERSHIP

Motor Vehicles

Functional Classification

The functional classification system is designed to serve transport needs within the community. The schematic diagram on the following page illustrates the competing functional nature of roadway facilities as it relates to access, mobility, multi-modal transport, and facility design. The diagram is useful to understand how worthwhile objectives can have opposing effects. For example, as mobility is increased (bottom axis), the provision for non-motor vehicle modes (top axis) is decreased accordingly. Similarly, as access increases (left axis), the facility design (right axis) dictates slower speeds, narrower travelways, and non-exclusive facilities. The goal of selecting functional classes for particular roadways is to provide a suitable balance of these four competing objectives.

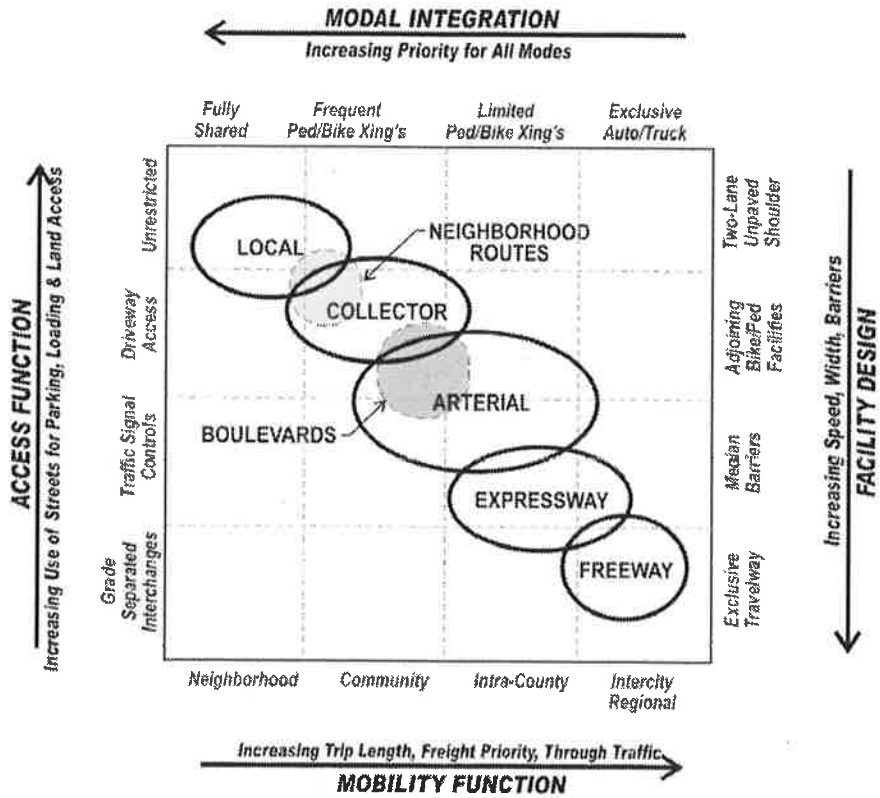
The diagram shows that as street classes progress from local to collector to arterial to freeway (top left corner to bottom right corner) the following occurs:

- *Mobility Increases* – Longer trips between destinations, greater proportion of freight traffic movement, and a higher proportion of through traffic.
- *Integration of Pedestrian and Bicycle Decreases* – Provisions for adjoining sidewalks and bike facilities are required up through the arterial class, however, the frequency of intersection or mid-block crossings for non-motorized vehicles steadily decreases with higher functional classes. The expressway and freeway facilities typically do not allow pedestrian and bike facilities adjacent to the roadway and any crossings are grade-separated to enhance mobility and safety.
- *Access Decreases*– The shared uses for parking, loading, and direct land access is reduced. This occurs through parking regulation, access control and spacing standards (see opposite axis).
- *Facility Design Standards Increase* – Roadway design standards require increasingly wider, faster facilities leading to exclusive travelways for autos and trucks only. The opposite end of the scale is the most basic two-lane roadway with unpaved shoulders.

Table 3-2: Existing Functional Classification of Sherwood Streets

Roadway	Federal	ODOT	Metro
ORE 99W	Principal Arterial	Statewide Highway - NHS Freight Route	Principal Arterial (Highway)
Tualatin-Sherwood Road	Urban Collector	Not Classified	Minor Arterial
Roy Rogers Road	Urban Collector	Not Classified	Minor Arterial
Oregon Street (east of Murdock)	Urban Collector	Not Classified	Minor Arterial
Murdock Road	Urban Collector	Not Classified	Minor Arterial
Sunset Boulevard	Local Road	Not Classified	Minor Arterial
Sherwood Boulevard	Urban Collector	Not Classified	Collector of Regional Significance
Oregon Street (west of Murdock)	Urban Collector	Not Classified	Collector of Regional Significance

Sources: ODOT, Oregon Highway Plan, 1999, and Metro, 2000 Regional Transportation Plan, Regional Motor Vehicle System. Refer to RTP for complete description of lower class roadways.



Two additional areas are noted on the diagram for **Neighborhood Routes** and **Boulevards** that span two conventional street classes.

The existing Sherwood functional class system for roadway facilities (shown on

Figure 3-8) ties together roadway design speed, number of travel lanes, and roadway cross-section. Linking functional class to road design standards has enabled the City to construct uniform high-quality improvements that were much needed with recent growth. However, this type of system also has limitations that include:

- High design speeds required on arterials in rolling and mountainous terrain can be cost prohibitive to construct.
- Modifying design standards to allow narrower roadway cross-sections (i.e., travel lanes, median lanes) where significant right-of-way, environmental or other design constraints can be difficult.
- Responding to Metro 2040 Street Guidelines that allow on-street parking, mid-block crossing and other "main street" design speeds on urban arterials.
- No clear systematic response to urban neighborhoods in addressed traffic calming needs.
- Sizing streets to better accommodate forecasted travel demands.

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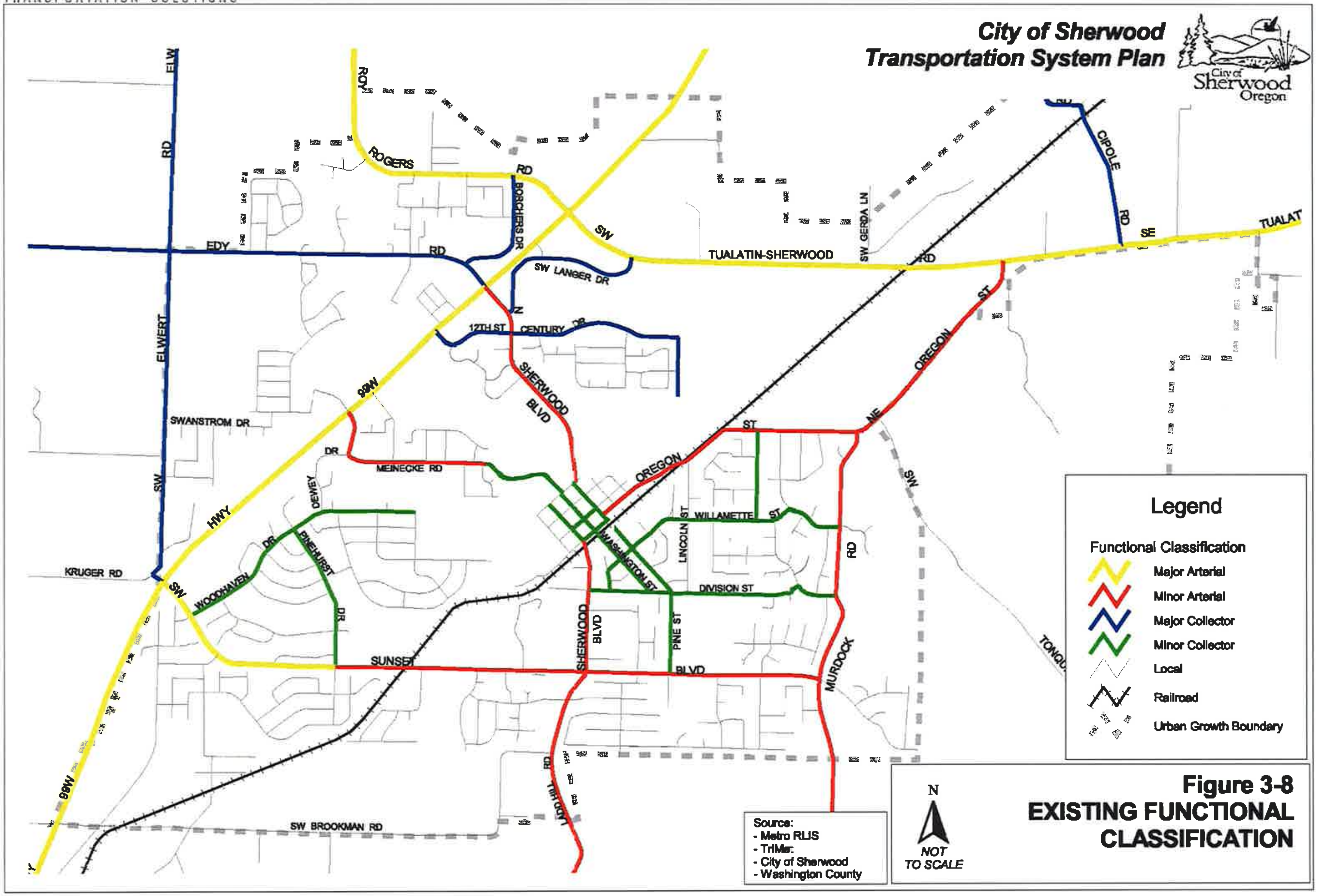

Figure 3-8
EXISTING FUNCTIONAL CLASSIFICATION

The last point relates to a recurring complication when developments are proposed within the allowed range of uses in a comprehensive plan, but the estimated added demand exceeds functional class parameters for the fronting county streets. For example, a high intensity use such as a regional shopping center, sports facility, or medical center may require more travel lanes on a collector facility than the three lanes typically allowed. The present plan organization would require a transportation plan amendment to address this issue. The new approach would better allow for the number of lanes to be determined independent of the functional classification.

In addition to the limitations listed above, the existing Sherwood functional classification is discontinuous along some roadways, with arterials leading to downtown switching to collectors in order to match existing design criteria. The TSP should address the limitations of the existing functional class and establish a system that better meets City and regional policy issues. A functional class system based primarily on connectivity would allow the design flexibility to handle each of the issues identified above.

Aside from the currently delineated road network, Sherwood has a history of a network of alleys serving the historic central business district. The Smockville Town plat (the original name for the City of Sherwood) identifies 9 blocks served by alleys, each designed with a 14 foot right-of-way. Smock Addition, added after the original settlement was constructed, includes five additional alleys.

Roadway Characteristics

Field inventories were conducted to determine characteristics of major roadways in the TSP study area. Data collected included posted speed limits, roadway lanes, and intersection controls. These characteristics define roadway capacity and operating speeds through the street system, which effects travel path choices for drivers in Sherwood.

Figure 3-9 shows a limited inventory of the posted speeds in Sherwood. The majority of roadways in Sherwood are posted at 25 miles per hour (mph). Arterial roadways such as Highway 99W, Tualatin-Sherwood Road, and Sunset Boulevard are posted at higher speeds ranging from 35 to 55 mph. Collector roadways such as Elwert Road, Edy Road, and Borchers Drive are posted at 35 to 40 mph.

Figure 3-10 shows the existing number of lanes on each roadway in Sherwood. The widest roadway is Highway 99W, which is generally 5-lanes with a 7-lane section between Sherwood Boulevard and Home Depot. Tualatin-Sherwood Road, parts of Oregon Street, Langer Drive, Sherwood Boulevard, and the western end of Sunset Boulevard are 3-lane roadways.

Figure 3-11 shows the existing intersection controls at the study intersections. Traffic signals exist mainly along Highway 99W and Tualatin Sherwood Road. As of 2003, Sherwood has three roundabouts that replace unsignalized intersections.

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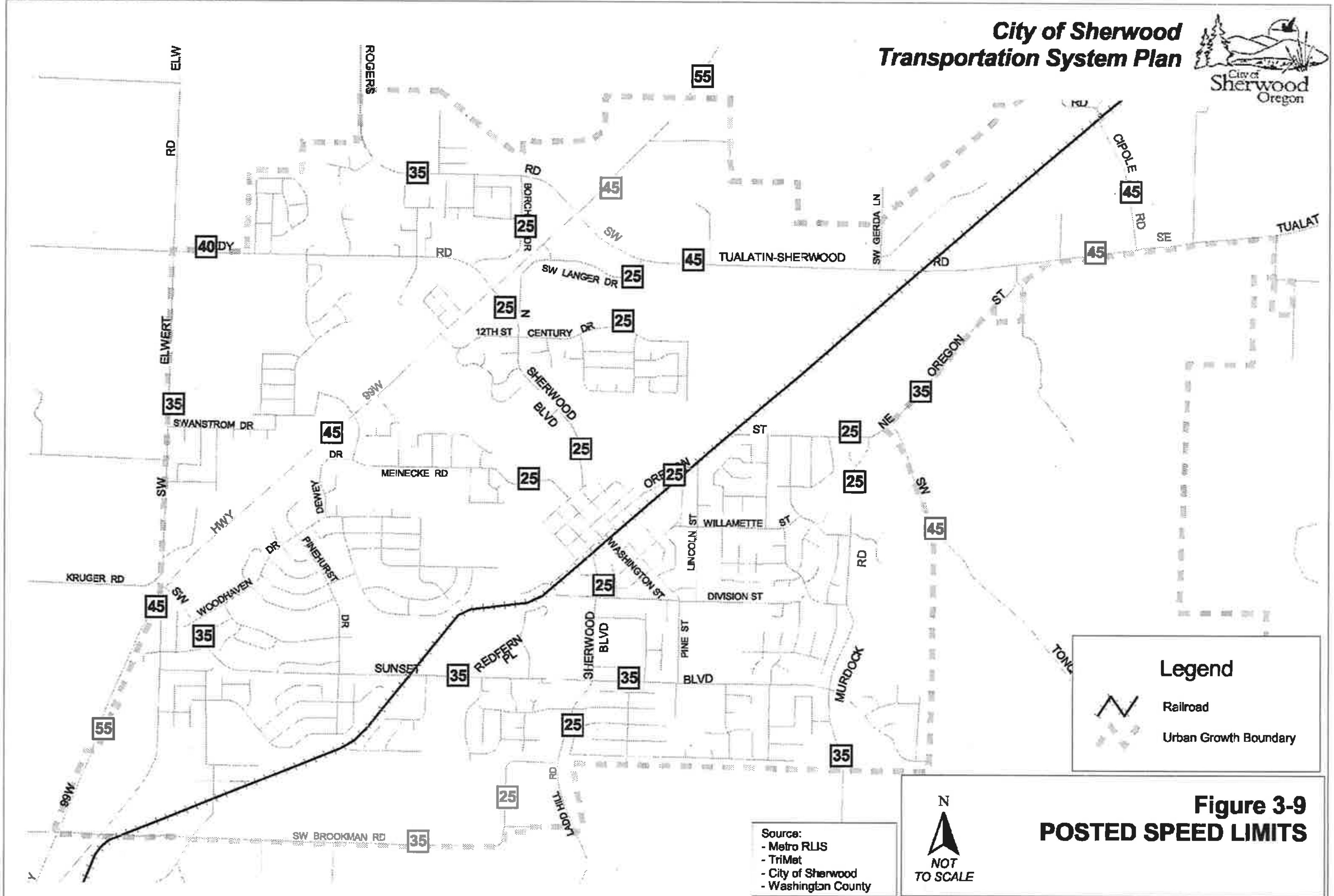

Figure 3-9
POSTED SPEED LIMITS

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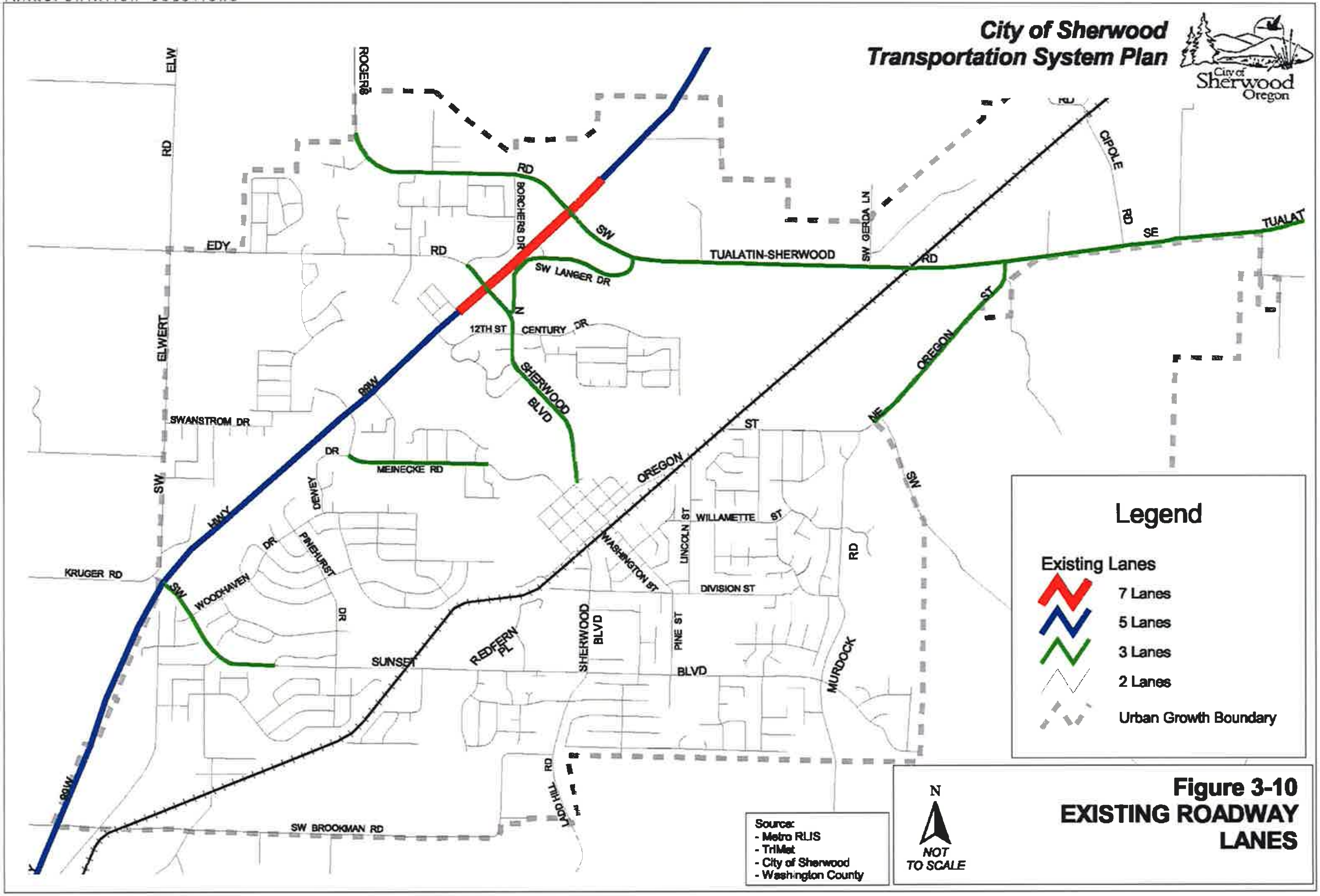

Figure 3-10
EXISTING ROADWAY LANES

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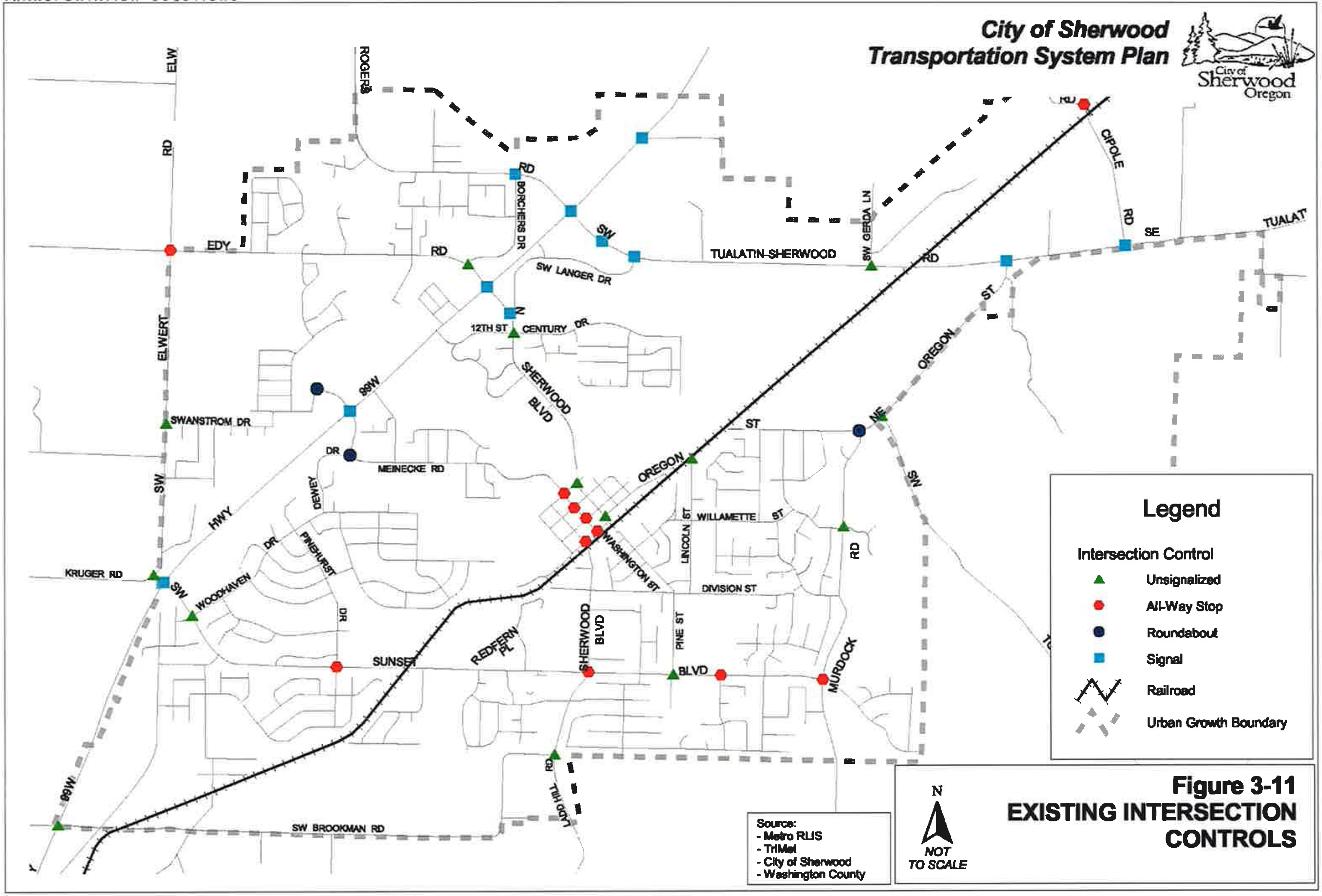

Legend

Intersection Control

- Unsignalized
- All-Way Stop
- Roundabout
- Signal
- Railroad
- Urban Growth Boundary

Source:
- Metro RLIS
- TriMet
- City of Sherwood
- Washington County

N
NOT TO SCALE

Figure 3-11
EXISTING INTERSECTION CONTROLS

Emergency Response Routes

Emergency services are provided in Sherwood by the Tualatin Valley Fire and Rescue District (TVFR). TVFR's Sherwood station is located at the corner of Oregon Street and Lincoln Street. Response times are a top priority for TVFR. In an effort to improve and maintain existing response times, TVFR is working with jurisdictions in their service area to establish primary response route designations and traffic calming device standards. Figure 3-12 shows the preliminary primary response routes in Sherwood. In addition, Figure 3-12 shows the existing traffic calming devices located on Sherwood streets. Generally, restrictive or deflective traffic calming devices (e.g. speed humps, raised intersections, and diverters) should not be located on primary emergency response routes.

Motor Vehicle Volume

A complete inventory of peak hour traffic conditions was performed in the spring of 2003 as part of the Sherwood TSP. The traffic turn movement 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. Turn movement counts were conducted at 35 intersections during the evening (4-6 PM) peak period to determine existing operating conditions. These counts were conducted after construction closures on Oregon Street and Meinecke Road. Study intersections were chosen in coordination with the City of Sherwood staff in order to address areas major roadways and noted areas of concern.

Figure 3-13 shows the two-way existing traffic volumes on streets in the Sherwood area. These two-way traffic volumes can vary from day to day and month-to-month based on weather, surrounding roadway conditions, holidays and school days. In addition, seasonal recreational traffic can vary the traffic volumes along Highway 99W by plus or minus five percent.

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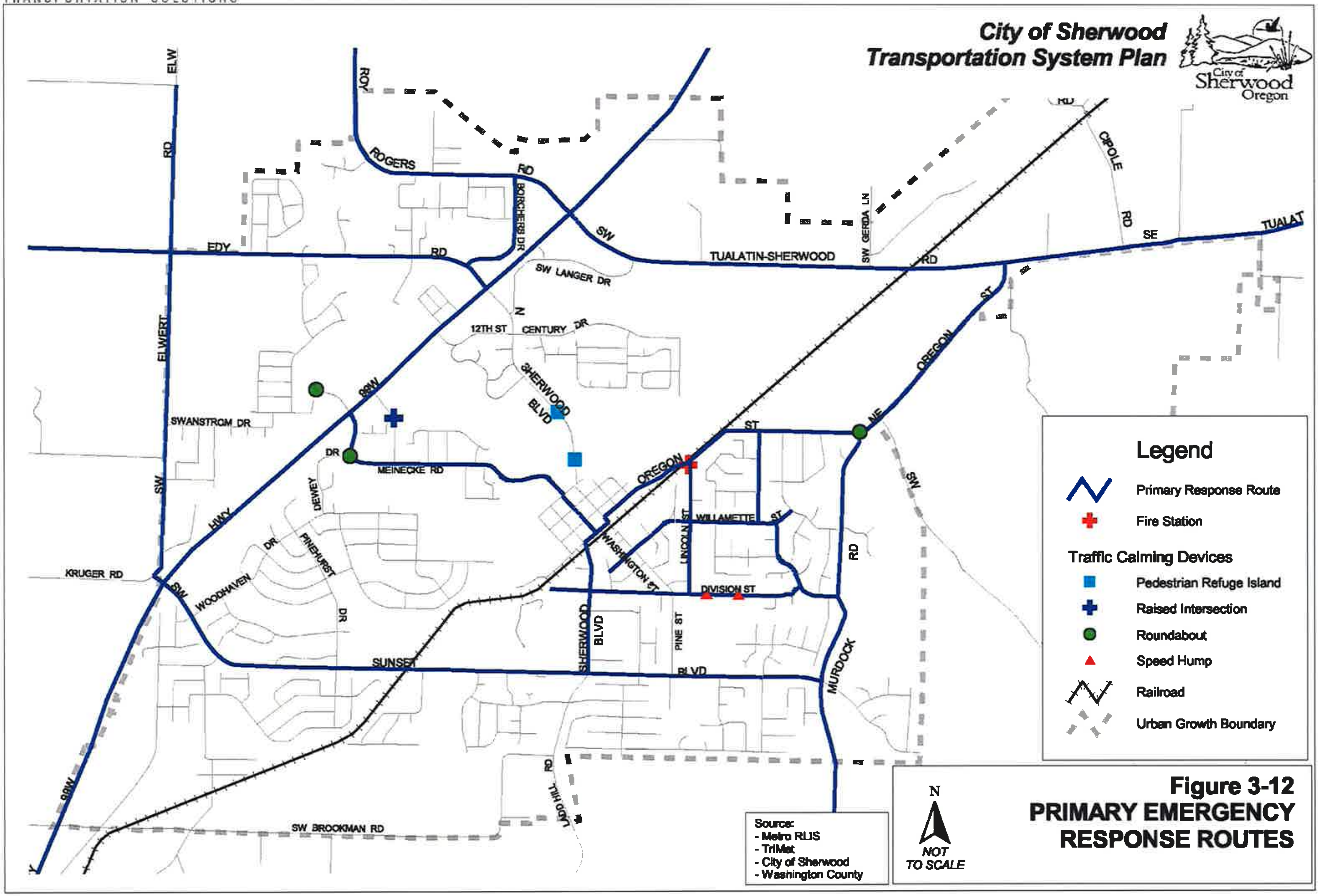

Figure 3-12
PRIMARY EMERGENCY RESPONSE ROUTES

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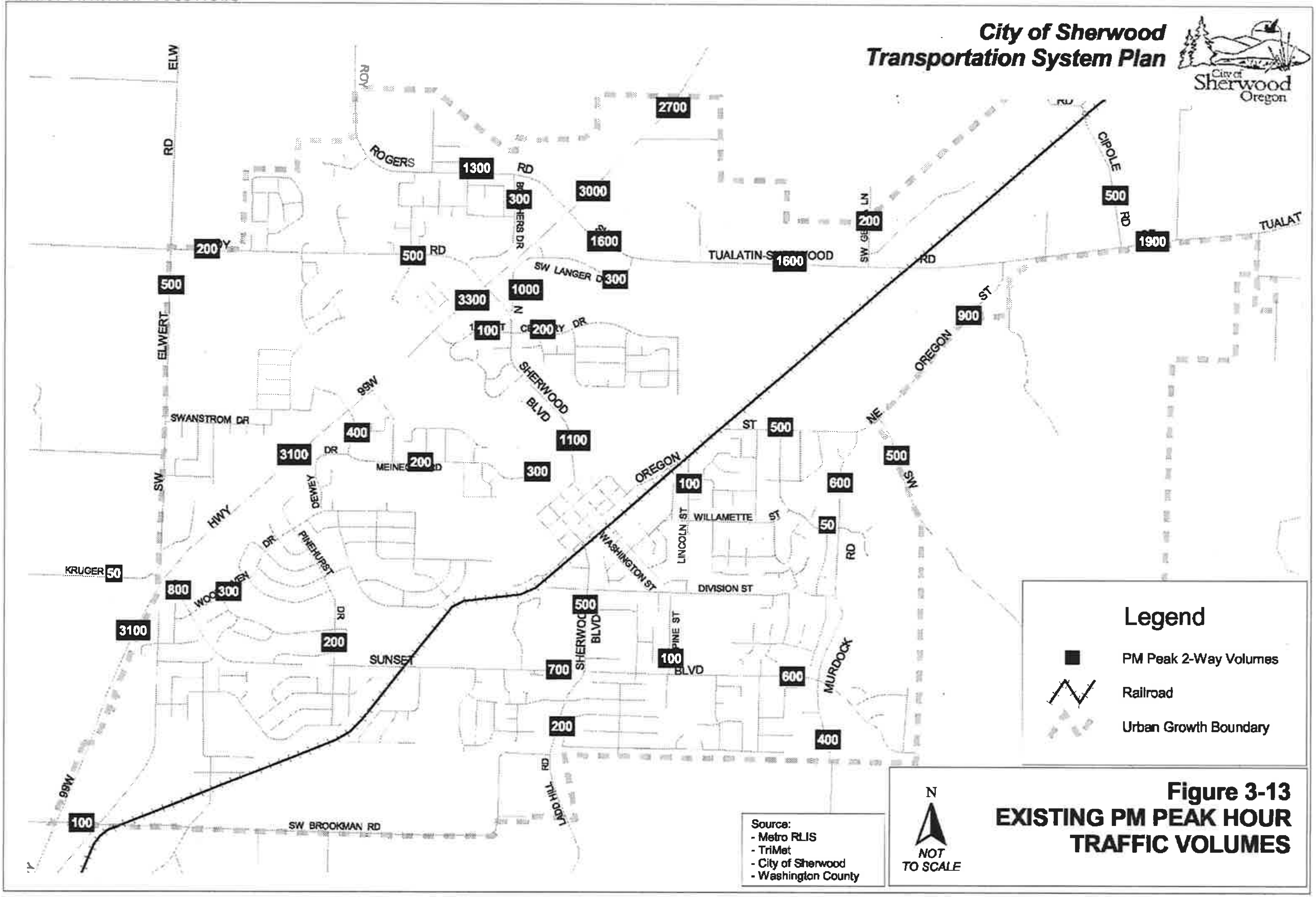

Figure 3-13
EXISTING PM PEAK HOUR TRAFFIC VOLUMES

Traffic Levels of Service

Level of Service (LOS) is used as a measure of effectiveness for intersection operation and is based on analysis of the PM peak hour as these volumes are typically the highest observed on a system wide basis. However, it should be noted that specific movements at particular intersections can experience operational issues at times other than peak periods. LOS is similar to a "report card" rating based upon average vehicle delay. Level of Service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. Level of Service D and E are progressively worse peak hour operating conditions. Level of Service F represents conditions where average vehicle delay exceeds 80 seconds per vehicle entering a signalized intersection and demand has exceeded capacity. This condition is typically evident in long queues and delays. Level of service D or better is generally the accepted standard for signalized intersections in urban conditions. Unsignalized intersections provide levels of service for major and minor street turning movements. For this reason, LOS E and even LOS F can occur for a specific 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 unsignalized intersections generally provide a basis to study intersections further to determine availability of acceptable gaps, safety and traffic signal warrants. A summary of the descriptions for level of service for signalized and unsignalized intersections is provided in the Level of Service Descriptions in the Sherwood Transportation System Plan technical appendix.

The intersection turn movement counts conducted during the evening peak periods were used to determine the existing 2003 LOS based on the *2000 Highway Capacity Manual* methodology for signalized and unsignalized intersections[3]. Traffic counts and level of service calculation sheets can be found in the appendix. Table 3- lists the existing PM peak hour intersection operation at the 35 study intersections. Each of the study intersections operates at a LOS of D or better, except for the unsignalized approaches at ORE 99W/Brookman and Sherwood Blvd/Century Drive. Figure 3-14 shows a summary of the study intersection operating conditions.

Table 3-3: Existing PM Peak Hour Intersection Level of Service

Intersection	Level of Service	Average Delay	Volume / Capacity
ORE 99W/Home Depot	B	10.4	0.70
ORE 99W/Tualatin-Sherwood Rd	D	43.0	0.84
ORE 99W/Sherwood Blvd	D	35.7	0.75
ORE 99W/Meinecke Rd	B	15.2	0.68
ORE 99W/Sunset Blvd	C	27.1	0.79
ORE 99W/Brookman Rd	C/F		
Tualatin-Sherwood Rd/Cipole Rd	C	24.8	0.84
Tualatin-Sherwood Rd/Oregon St	D	36.4	0.94
Tualatin-Sherwood Rd/Gerda Ln	B/F		
Tualatin-Sherwood Rd/Langer Dr	B	19.2	0.64
Tualatin-Sherwood Rd/Regal Cinemas	C	21.0	0.60
Brookman Rd/Ladd Hill Rd	A/A		
Cipole Rd/Herman Rd	B	10.6	0.43
Edy Rd/Borchers Dr	A/C		

[3] *2000 Highway Capacity Manual*, Transportation Research Board, 2000.

Intersection	Level of Service	Average Delay	Volume / Capacity
Edy Rd/Elwert Rd	B	12.0	0.60
Elwert Rd/Kruger Rd	A/B		
Elwert Rd/Swanstrom Dr	A/B		
Meinecke Rd/Dewey Dr	A	3.6	0.17
Murdock Rd/Willamette St	A/C		
Oregon St/Lincoln St	A/B		
Oregon St/Murdock Rd	A	7.3	0.68
Oregon St/Tonquin Rd	A/D		
Pine St/Oregon St	A/D		
Roy Roger Rd/Borchers Dr	A	9.0	0.55
Sherwood Blvd/3rd St	A/D		
Sherwood Blvd/Century Dr	A/F		
Sherwood Blvd/Langer Dr	D	42.2	0.65
Sherwood Blvd/Railroad Ave	B	11.6	0.56
Sunset Blvd/Murdock Rd	B	10.4	0.44
Sunset Blvd/Pine St	A/C		
Sunset Blvd/Pinehurst Dr	B	12.2	0.57
Sunset Blvd/Sherwood Blvd	C	19.4	0.82
Sunset Blvd/Woodhaven Dr	A/C		
Washington St/3rd Ave	A	8.2	0.21
Washington St/Railroad Ave	B	12.8	0.62

Signalized and All-Way Stop Intersection LOS:

LOS = Level of Service
Delay = Average vehicle delay in the peak hour for entire intersection
V/C = Volume to Capacity Ratio

Unsignalized Intersection LOS:

A/A=Major Street turn LOS/Minor street turn LOS

Roundabout Intersection LOS:

LOS = FHWA Methodology Level of Service
Delay = FHWA Methodology Level of Service
V/C = HCM Methodology worst approach Volume to Capacity Ratio

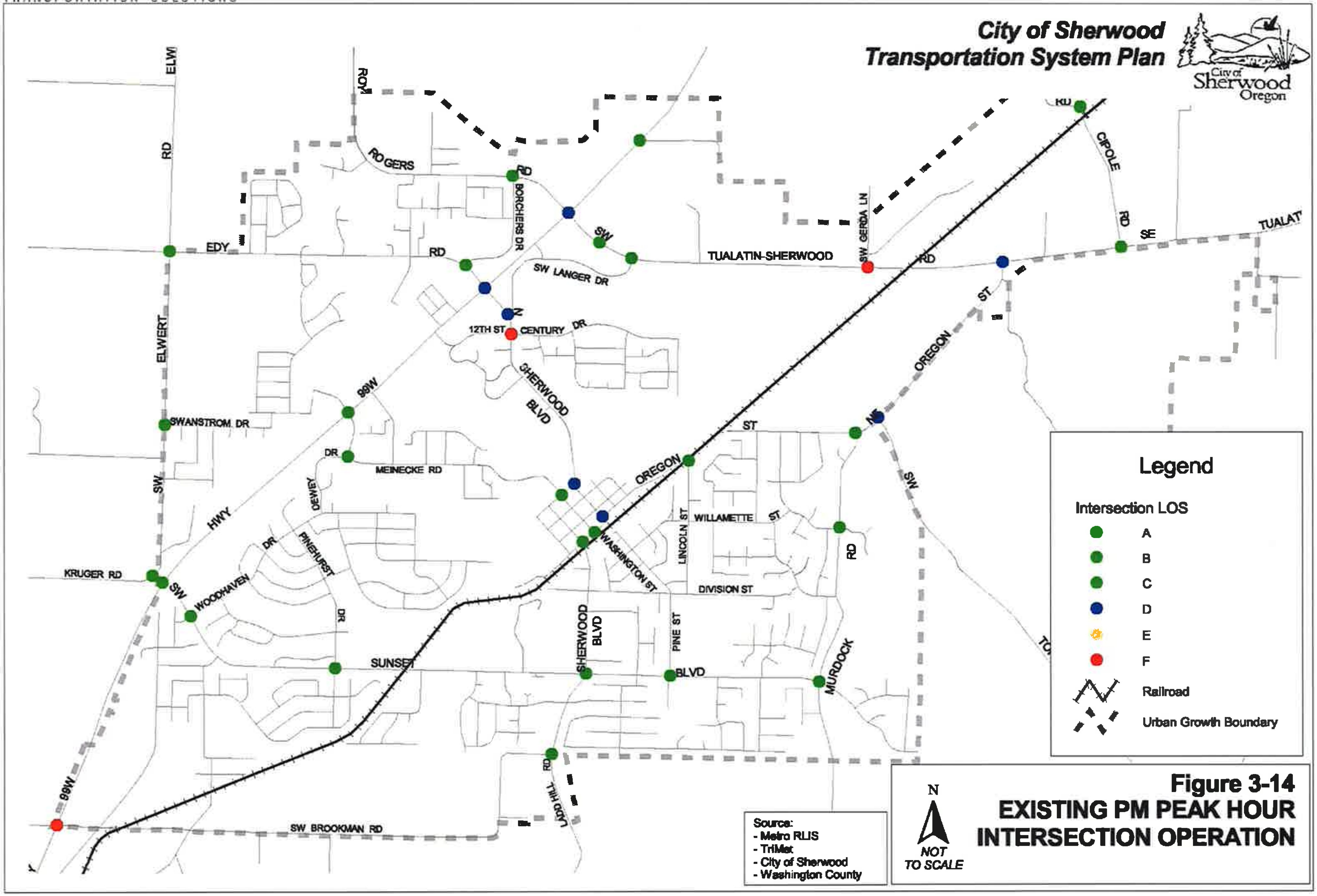

Figure 3-14
EXISTING PM PEAK HOUR INTERSECTION OPERATION

The Highway Capacity Manual Methodology for signalized intersection analysis treats each intersection as an isolated signal within a roadway system. In addition, travel time is a key measure of transportation service and accessibility in a city. It provides a common reference for comparison between modes and a historical reference in future years. Arterial level of service for the entire system is based on the average travel speed of a vehicle to passing through the study area. The *2000 Highway Capacity Manual* includes a methodology for calculating the arterial level of service based on measured or estimated travel speeds along the study corridor. A detailed description of the methodology is included in the appendix.

Travel time runs were conducted during April 2003 along ORE 99W and Tualatin-Sherwood Road. The travel time runs were conducted during the AM and PM peak periods, starting at Cipole Road on Tualatin-Sherwood Road and finishing at Sunset Boulevard on ORE 99W. Table 3- lists the average travel speeds measured during the travel time runs. As listed in the table, the average travel speeds indicate that ORE 99W operates at a LOS of B during both the AM and PM peak periods. Tualatin-Sherwood Road operates at a LOS of B in the eastbound direction and a LOS of C in the westbound direction during both peak periods. Plots of the real time travel speeds (in 3-second increments) are included in the appendix.

The travel time runs were conducted after the completion of two key improvements: the Highway 99W/Tualatin Road intersection improvements stretching through the Regal Cinemas signal, and the opening of the Oregon Street roundabout. The average speeds listed in Table 3-3 indicate that the recent improvement projects have significantly improved the operation of these facilities, which used to commonly bottleneck on Tualatin-Sherwood Road from Highway 99W through Langer Drive, also causing queue backups for turning movements from Highway 99W onto Tualatin-Sherwood Road.

Table 3-4: Existing (2003) Average Travel Speeds and LOS

	Average Travel Speed (mph)		Level of Service	
Route	AM	PM	AM	PM
Tualatin-Sherwood Road Eastbound	28	30	B	B
Tualatin-Sherwood Road Westbound	22	27	C	C
Highway 99W Southbound	28	34	B	B
Highway 99W Northbound	31	34	B	B

The segment of Highway 99W listed in Table 3- includes a portion of the area managed by the City of Sherwood 99W Capacity Allocation Program (CAP) program, which covers Highway 99W from the north to the south city limits. The CAP ordinance was established with a LOS of E threshold for Highway 99W (corresponding to a seven-minute travel time through the city limits). The existing travel speeds indicate that the portion of Highway 99W from Tualatin-Sherwood Road to Sunset operates significantly better than the LOS E CAP threshold.

Collisions

Collision data was obtained from Washington County and used to create a high collision intersection list for intersections within Sherwood. The County ranks intersections in their Safety Priority Index System (SPIS) based on the most current three years of collision data. The SPIS rankings are derived from factors such as the number of collisions, the type of collisions, the collision severity, and traffic volumes. The collision data only includes those collisions reported to the Oregon Department of Transportation. In addition, the County SPIS list only includes intersections that have at least one county controlled approach. Sherwood has five intersections on the County SPIS list for 1999-2001. Table 3- lists each intersection. The safety at these intersections should be considered in this TSP.

Table 3-5: SPIS Ranking of Five Highest Sherwood TSP Study Area Intersections (1999-2001)

Ranking	Street	Cross Street	Number of Collisions	Fatal Collisions	Injury Collisions
69	Highway 99W	Tualatin-Sherwood Rd	20	1	6
81	Oregon Street	Tualatin-Sherwood Rd	20	0	13
95	Cipole Road	Tualatin-Sherwood Rd	25	0	10
152	Brookman Rd	Highway 99W	6	1	3
206	Edy Rd-Sherwood Blvd	Highway 99W	13	0	5

In addition to motor vehicle crashes, pedestrian and bicycle modes often face serious challenges in relation to safety issues. Table 3-6 identifies the crashes involving pedestrians and bicyclists in Sherwood between 1999 and 2001.

Table 3-6: Pedestrian and Bicycle Crashes in the Sherwood TSP Study Area (1999-2001)

Mode	Number of Collisions	Fatal Collisions	Injury Collisions
Pedestrian	3	0	3
Bicycle	4	0	4

Trucks

Efficient truck movement plays a vital role in the economical movements of raw materials and finished products. The designation 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. The Washington County TSP identifies through truck routes in the Sherwood areas as ORE 99W and Tualatin-Sherwood Road, which is shown in Figure 3-15. In addition, ODOT designates ORE 99W as a freight route[4].

The truck (heavy vehicle) volumes and percentages of the traffic stream were collected as part of the intersection turn movement counts in April 2003. Figure 3-16 shows the PM peak hour truck volume and percentages at each of the study intersection. Truck volumes exceed 100 vehicles per hour (vph) along ORE 99W. Truck volumes exceed 50 vph along Tualatin-Sherwood Road, Roy Rogers Road, and Sherwood Boulevard north of Century Drive.

[4] *1999 Oregon Highway Plan*, The Oregon Department of Transportation, May 1999.

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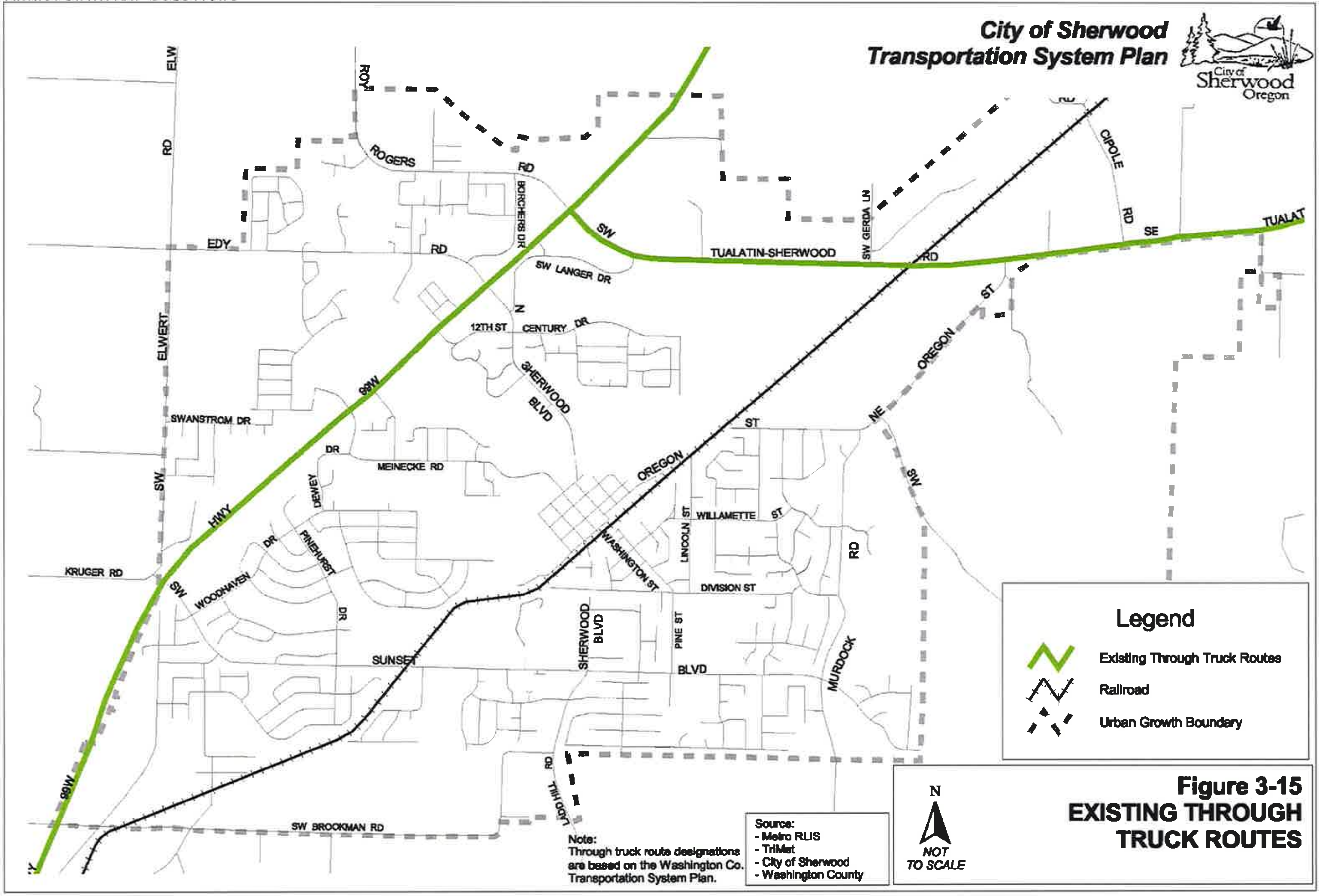

Note:
Through truck route designations are based on the Washington Co. Transportation System Plan.

Source:
- Metro RLIS
- TriMet
- City of Sherwood
- Washington County

Figure 3-15
EXISTING THROUGH TRUCK ROUTES

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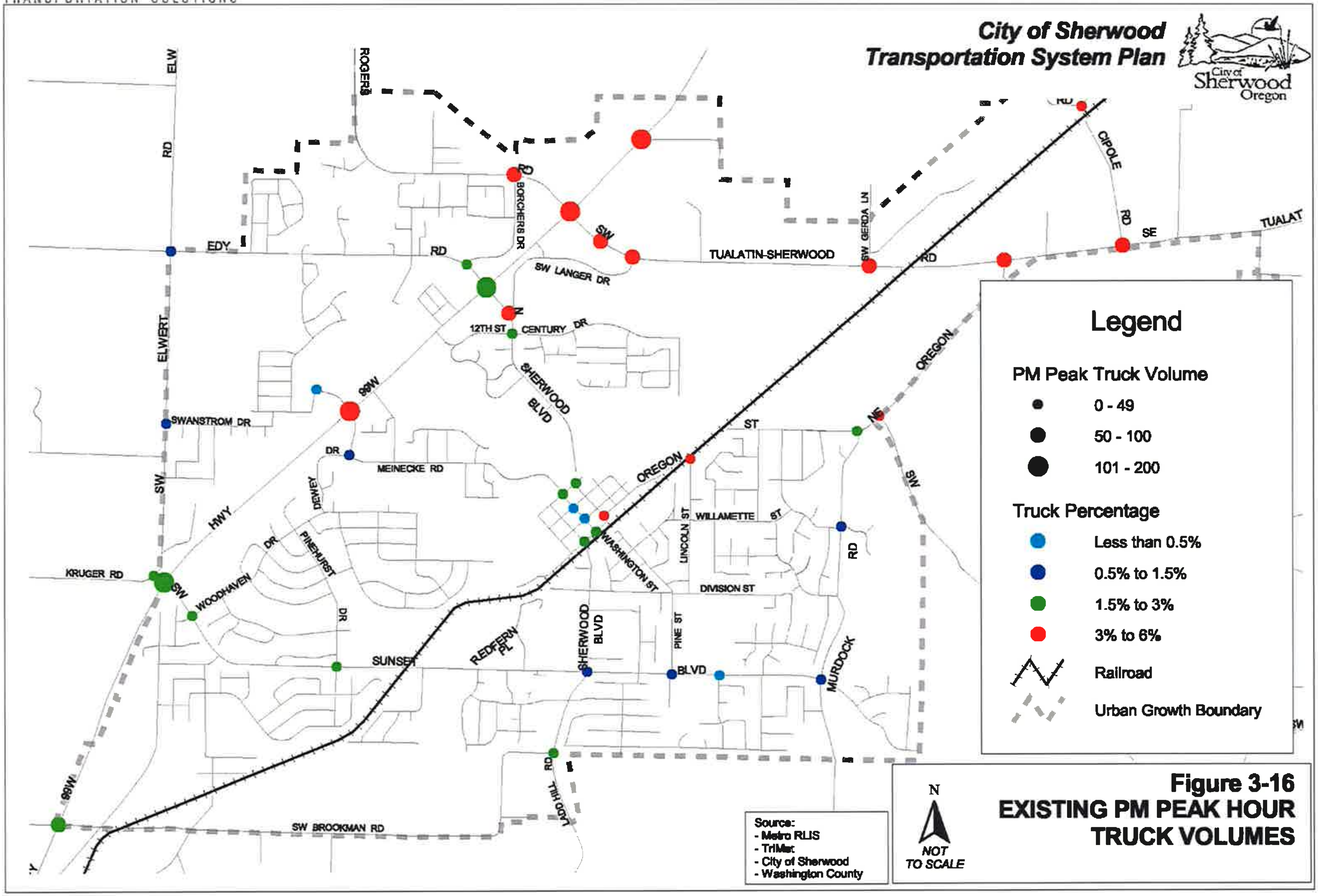

Figure 3-16
EXISTING PM PEAK HOUR TRUCK VOLUMES

Other Modes

There are four other modes of transportation in Sherwood included in the TSP: rail, pipeline, air, and water. There are no designated airports or heliports in the TSP study area. There are also no navigable waterways in the TSP study area. Figure 3-17 shows the rail and pipeline facilities in Sherwood.

The rail line in Sherwood is operated by Portland & Western (P&W), a sister company of Willamette & Pacific (W&P) Railroad and a subsidiary of Genesee & Wyoming Incorporated. The line runs north and west of Sherwood, passing through Tualatin and Lake Oswego on its way to the Willamette River crossing.

Northwest Natural operates several high-pressure pipelines that serve Sherwood. These lines run along Elwert Road, Cipole Road, Tualatin-Sherwood Road, and Oregon Street. In addition, Kinder Morgan operates a petroleum gas line (gasoline and diesel) that runs from the Port of Portland to Eugene through the eastern part of Sherwood.

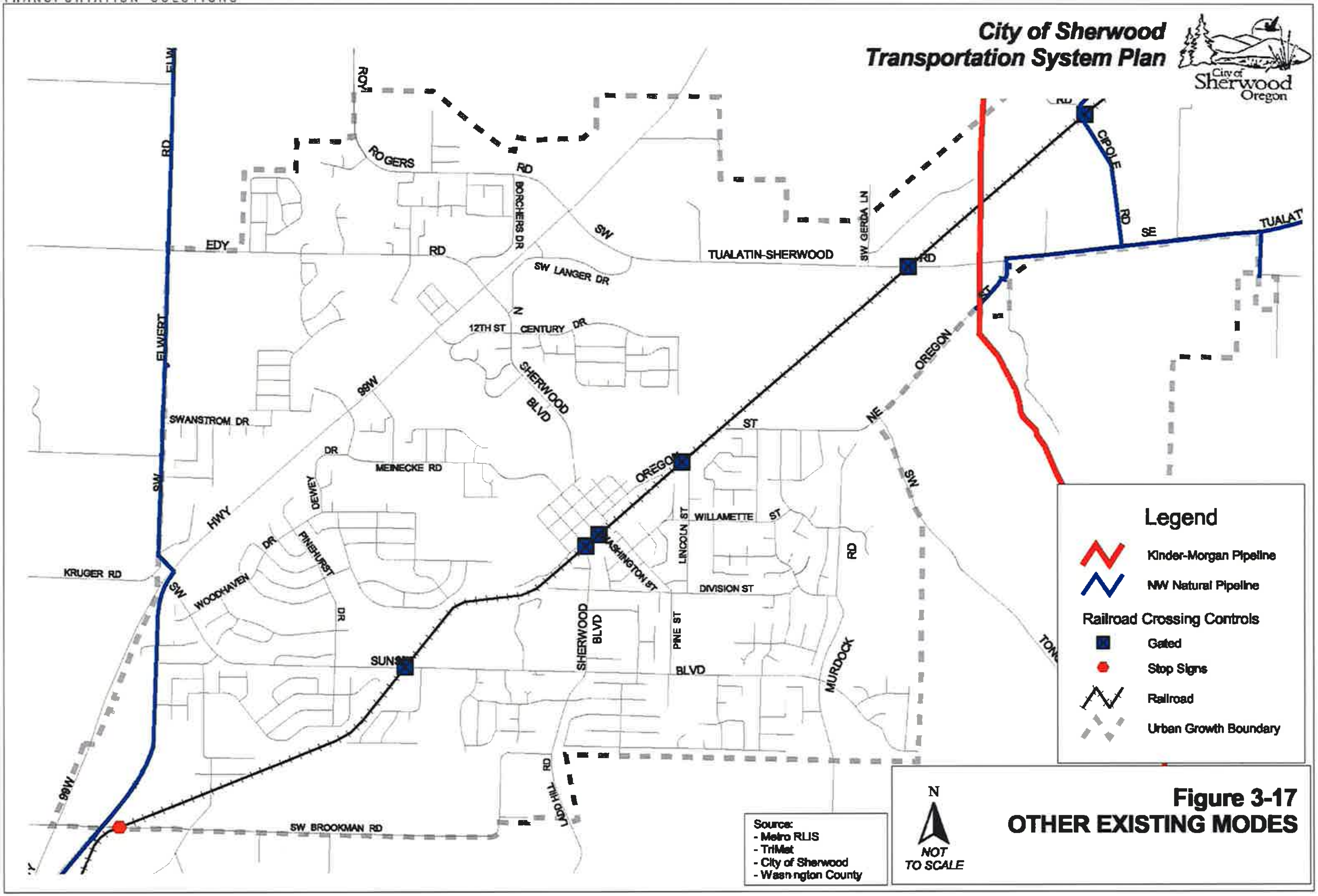

Figure 3-17
OTHER EXISTING MODES

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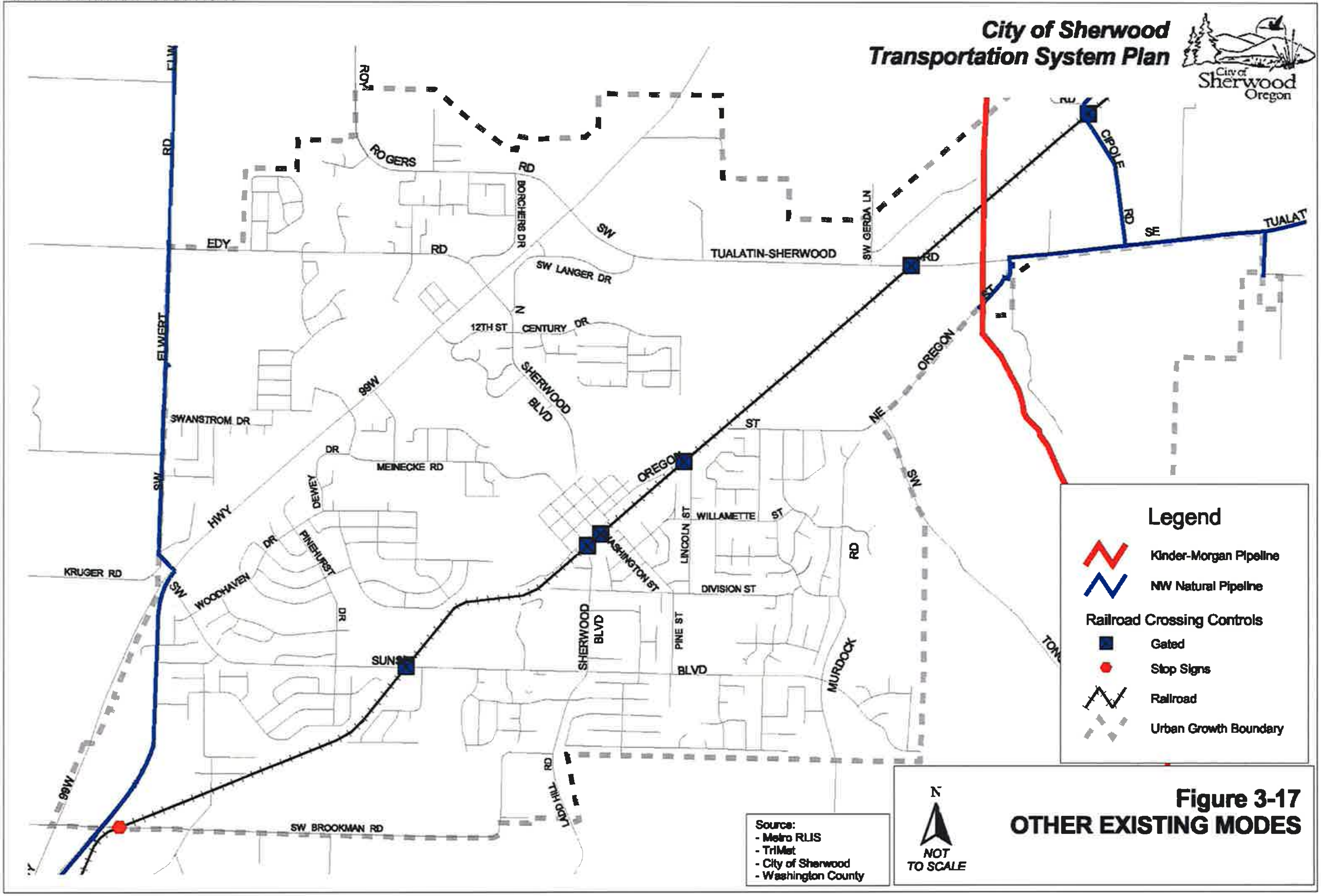

Figure 3-17
OTHER EXISTING MODES

4. FUTURE DEMAND AND LAND USE

The Sherwood Transportation System Plan addresses existing system needs and additional facilities that are required to serve future growth. Metro's urban area transportation forecast model was used to determine future traffic volumes in Sherwood. This forecast model translates assumed land uses into personal travel, selects modes, and assigns motor vehicles to the roadway network. 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 land use scenario developed from the existing Comprehensive Plan designations and allowed densities.

Projected Land Uses

Land use is a key factor in developing a functional transportation system. The amount of land that is planned to be 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 areas within the urban growth boundary (including the recently adopted expansion areas) and reflect the Comprehensive Plan and Metro's land use assumptions for the year 2020. Complete land use data sets were developed for the following conditions:

- Existing 2000 Conditions (base travel forecast for the region)
- Year 2020 Conditions

The base year travel model is updated periodically and for this study effort, the available base model provided by Metro was for 2000. Land uses were inventoried throughout Sherwood by Washington County and Metro. This land use database includes the number of dwelling units, the number of retail employees, and the number of other employees. Table 4-1 summarizes the land uses for existing conditions and the future scenario within the Sherwood TSP study area. While these summaries only outline land use in Sherwood for the purposes of this study, the travel demand forecasts that have been evaluated reflect the regional land use growth throughout the Portland metropolitan area (the four county area). A detailed summary of the uses for each Transportation Analysis Zone (TAZ) within the Sherwood study area is provided in the Appendix.

Table 4-1: Sherwood Land Use Summary

Land Use	2000	2020	Increase	Percent Increase
Households (HH)	4,813	7,769	2,956	61%
Retail Employees (RET)	572	1,964	1,392	243%
Other Employees (OTH)	3225	6,476	3,251	101%

At the existing level of land development, the transportation system generally operates without significant deficiencies in the study area. As land uses are changed in proportion to each other (i.e. there is a significant increase in employment relative to household growth), there will be a shift in the overall operation of the transportation system. Retail land uses generate higher amounts of trips per acre of land 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 or residential), the transportation system must support significant trips coming to or from the community rather than within the community. Typically, there should be a mix of residential, commercial, and employment type land uses so that some residents may work and shop locally, reducing the need for residents to travel long distances.

Table 4-1 indicates that significant growth is expected in Sherwood in the coming decades. The transportation system in Sherwood should be monitored to make sure that land uses in the plan are balanced with transportation system capacity. This TSP balances needs with the forecasted 2020 land uses.

For transportation forecasting, the land use data is stratified into geographical areas called transportation analysis zones (TAZs), which represent the sources of vehicle trip generation. There are approximately 10 Metro TAZs within the Sherwood TSP study area. These 10 TAZs were subdivided, as part of this plan, into 40 TAZs to more specifically represent land use in Sherwood. The disaggregated model zone boundaries are shown in Figure 4-1.

Metro Area Transportation Model

A determination of future traffic system needs in Sherwood requires 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 to the transportation system to meet travel demand as developed in an urban area travel demand model as part of the Regional Transportation Plan update process. Metro uses EMME/2, a computer based program for transportation planning, to process the large amounts of data for the Portland Metropolitan area. For the Sherwood TSP, the Washington County focused area model was used to forecast 2020 travel with substantially more detail added into the Sherwood area.

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 are as follows:

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

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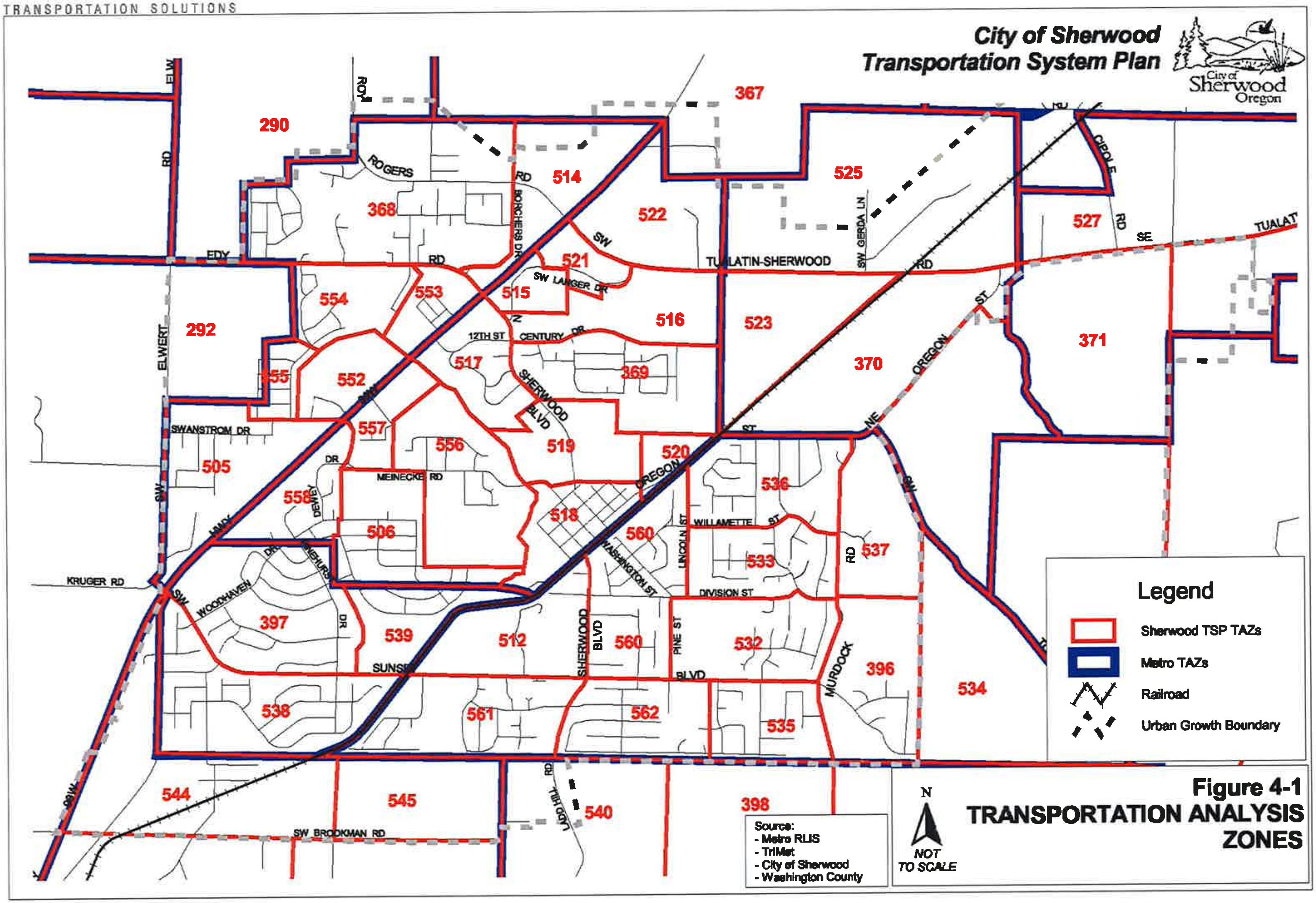

Figure 4-1
TRANSPORTATION ANALYSIS ZONES

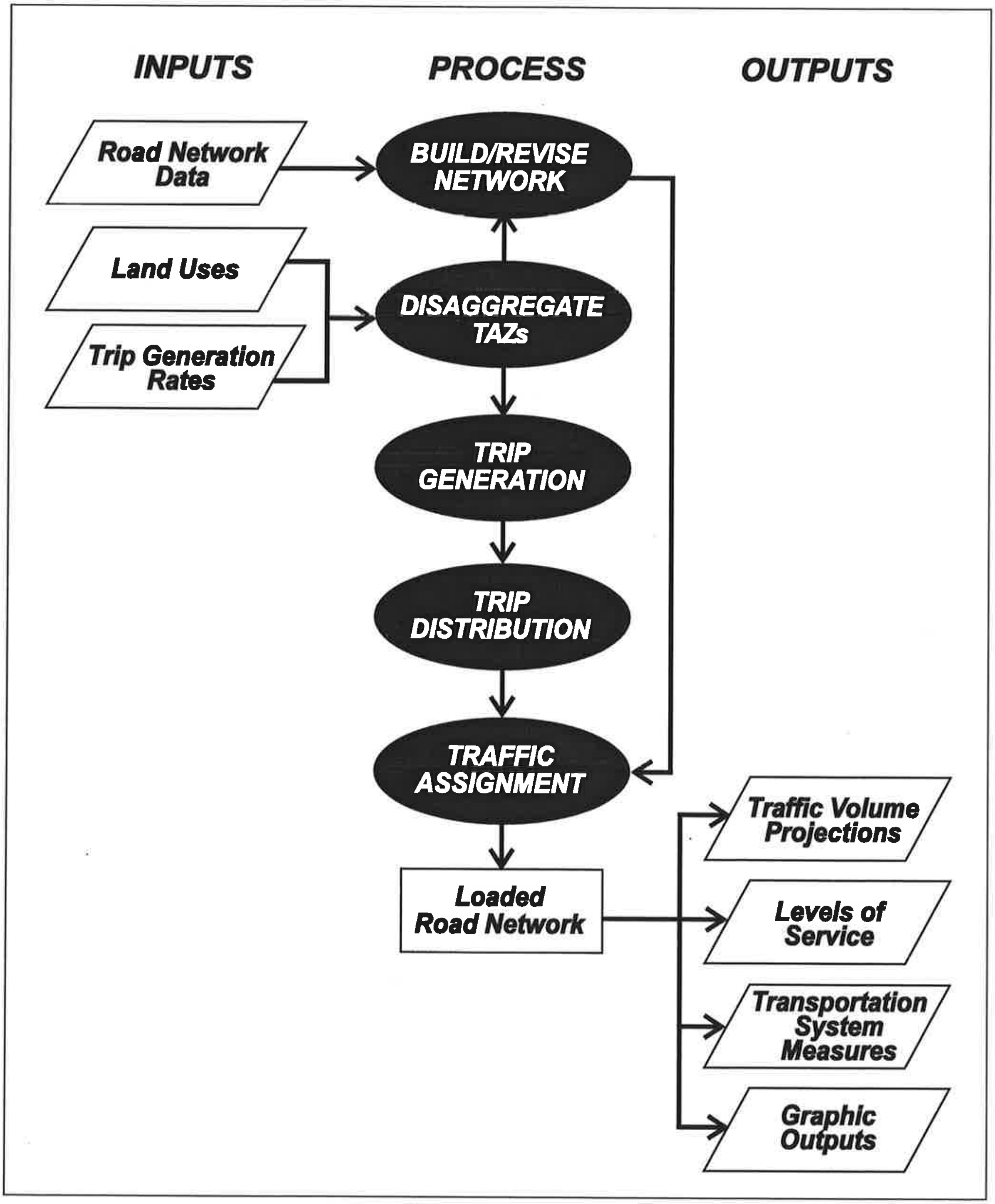

Figure 4-2
MODEL PROCESS

Trip Generation

The trip generation process translates land use quantities (number of dwelling units, retail, and other employment) into vehicle trip ends (number of vehicles entering or leaving a TAZ or sub-TAZ) using trip generation rates established during the model verification process. The Metro trip generation process is elaborate, entailing detailed trip characteristics for various types of housing, retail employment, non-retail employment, and special activities. Typically, most traffic impact studies rely on the Institute of Transportation Engineers (ITE) research for analysis[1]. The model process is tailored to variations in travel characteristics and activities in the region. For reference, Table 4-2 provides a summary of the approximate average evening peak hour trip rates used in the Metro model. These are averaged over a broad area and thus, are different than driveway counts represented by ITE. This data provides a reference for the trip generation process used in the model.

Table 4-2: Approximate Average PM Peak Hour Trip Rates Used in Metro Model

	Average Trip Rate/Unit		
Unit	In	Out	Total
Household (HH)	0.43	0.19	0.62
Retail Employee (RET)	0.78	0.69	1.47
Other Employee (OTH)	0.07	0.29	0.36

Source: DKS/Metro

Table 4-3 illustrates the estimated growth in vehicle trips generated within the Sherwood area during the PM peak period (2-hr peak) between 2000 and 2020. It indicates that vehicle trips in Sherwood would grow by approximately 55 percent between 2000 and 2020 if the land develops according to Washington County and Metro's 2020 land use assumptions. Assuming a 20-year horizon to the 2020 scenario, this represents an annualized growth rate of about 2 percent per year.

Table 4-3: Existing and Future Projected Vehicle Trip Generation PM Peak 2-Hour Period Vehicle Trips

	2000 Trips	2020 Trips
Sherwood TSP study area	10,900	16,900

[1] *Trip Generation Manual*, 6th Edition, Institute of Transportation Engineers, 1997.

Trip Distribution

This step estimates how many trips travel from one zone in the model to any other zone. 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 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 Sherwood are essentially a function of future land use in the city, the distribution of trips is influenced by regional growth, particularly in neighboring areas such as Tualatin, Tigard, Wilsonville, and Newberg, as well as unincorporated areas to the north, south, and east of Sherwood. External trips (trips that have either an origin and not a destination in Sherwood or have a destination but not an origin in Sherwood) and through trips (trips that pass through Sherwood 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 Urban Growth Boundary (UGB) calibration.

Mode Choice

This is the step where it is determined how many trips will be by various modes (single-occupant vehicle, transit, truck, carpool, pedestrian, bicycle, etc.). The 2000 mode splits are 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 network, and resulting trip volumes are accumulated on links of the network until all trips are assigned.

Network travel times are updated to reflect the congestion effects of the traffic assigned through an equilibrium process. 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 impact of congestion on travel times (greater delay) as traffic volume increases. The volume-delay functions take into account the specific characteristics of each roadway link, such as capacity, speed and facility type. This allows the model to reflect conditions somewhat similar to driver behavior.

Model Verification

The base 2000 modeled traffic volumes were compared against actual traffic volume counts across screenlines, on key arterials, and at key intersections. Most arterial traffic volumes meet screenline tolerances for forecast adequacy. Based on this performance, the model was used for future forecasting and assessment of circulation change.

Metro Travel Demand Model Application to Sherwood

Intersection turn movements were extracted from the model at key intersections for both the base year 2000 and forecast year 2020 scenarios. These intersection turn movements were not used directly, but a portion of the increment of the year 2020 turn movements over the 2000 turn movements was applied (added) to existing (actual 2003) turn movement counts in Sherwood. A post processing technique is utilized to refine model travel forecasts to the volume forecasts utilized for 2020 intersection analysis. The turn movement volumes used for future year intersection analysis can be found in the technical appendix for the TSP. Figure 4-3 shows the forecasted PM peak hour two-way volumes on major roadways in Sherwood based on a 2020 No-Build scenario. The No-Build scenario includes the Washington County TSP mitigation projects outside of the Sherwood area.

The forecasted 2020 peak hour volumes on Tualatin-Sherwood Road and Highway 99W are significantly lower than what previous planning projects had identified (Washington County TSP, Tualatin TSP, Oregon Highway Plan). This difference in forecasts is related to both a change in the base year model and a change in the future 2020 model.

The base year for the travel demand model used for previous studies was 1994. The latest travel demand model used for the Sherwood TSP is based on the year 2000. Between the year 1994 and 2000, Sherwood and the surrounding area has grown significantly. The 2000 base model volumes are significantly higher than the 1994 volumes, which corresponds to recent development. The base year 2000 model volumes were calibrated with the 2003 peak hour counts conducted for the TSP. Therefore, the 2000 base year travel demand model better reflects existing conditions. The higher base year volumes reduces the growth increment applied to the existing (2003) counts, which reduces the final 2020 post-processed volume forecasts.

In addition to the increase in the base year model volumes, the 2020 model has a significant change in the external zone representing Newberg and the communities south of Sherwood on Highway 99W. Metro has recently reduced the forecasted growth for the external Newberg zone, corresponding to a decrease of approximately 10% in 2020 trips traveling through Sherwood on Highway 99W[2]. Combined with the increased base year volumes, this decrease in 2020 volumes results in the lower forecast of traffic volume on Tualatin-Sherwood Road and Highway 99W.

[2] Based on conversation with Steve Kelley, Washington County, July 2003.

Future (2020) System Assumptions

The Metro regional travel demand forecast model was used to determine future (2020) traffic volumes for the City of Sherwood. The 2020 base model assumed RTP programmed improvements as a base case scenario. The improvements that are located within the City of Sherwood and have an impact on motor vehicle roadway capacity are listed in Table 4-4. Other projects in the area (i.e. adjacent cities and counties) are included as listed in the RTP. These other projects could have impact on travel behavior within Sherwood.

Table 4-4: RTP Projects Included in Future (2020) Travel Demand Modeling

Project	Estimated Cost ($1,000s)	Model Updates
Oregon Street Improvements—widen to three lanes with a traffic signal at Tualatin-Sherwood Road (Tualatin-Sherwood to Murdock)	$5,500	Additional center turn lane
Edy Road/Sherwood Boulevard Improvements—Borchers to Pine/3rd Street	$1,500	Additional center turn lane
Tualatin-Sherwood Road Improvements—widen to five lanes with bike lanes and sidewalks, intertie signals at Oregon and Cipole streets	$25,000	Two additional travel lanes (one each direction)

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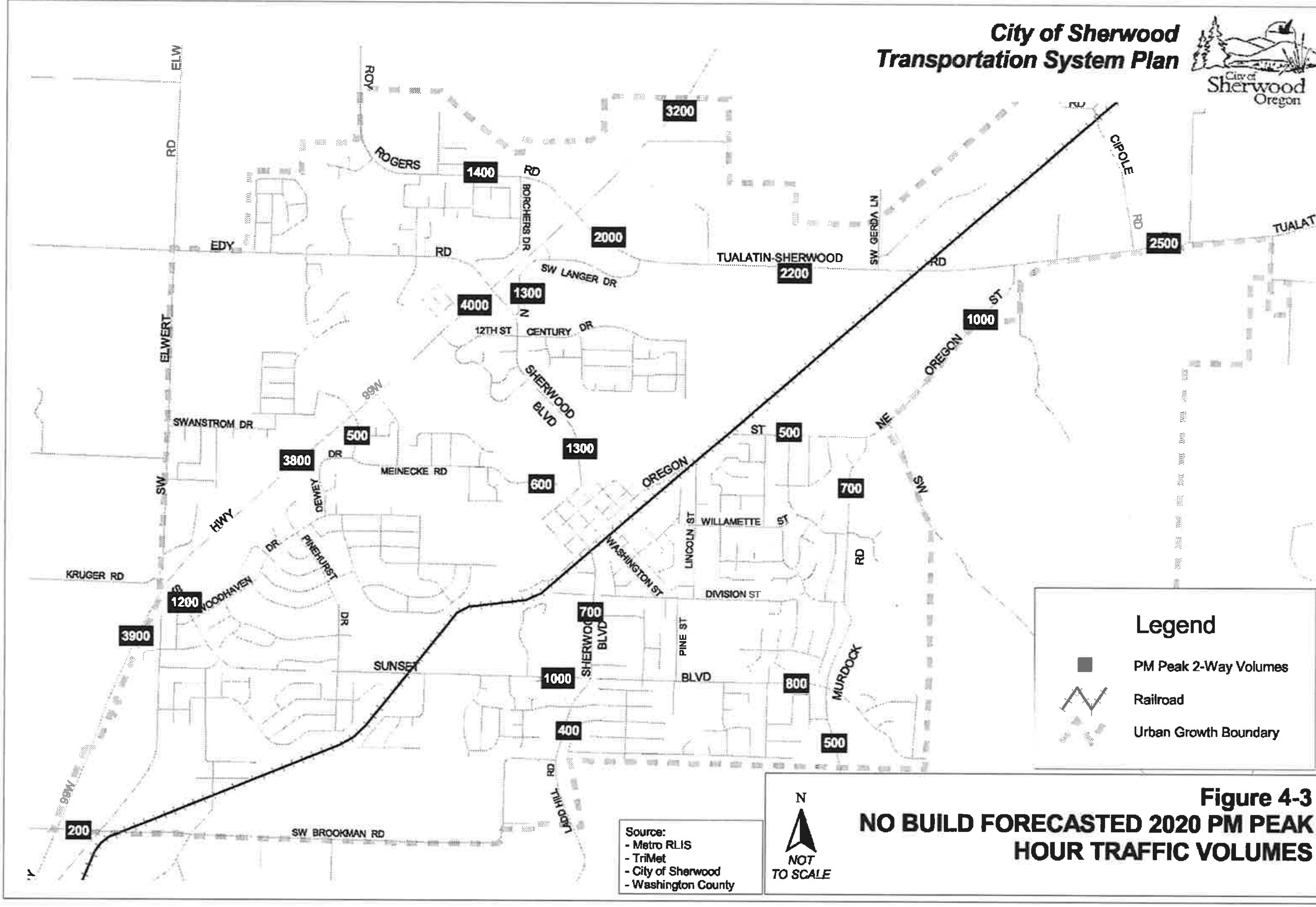

Figure 4-3
NO BUILD FORECASTED 2020 PM PEAK HOUR TRAFFIC VOLUMES

5. PEDESTRIAN PLAN

This chapter summarizes existing and future pedestrian needs in the City of Sherwood, and outlines strategies and an Action Plan. The criteria used in evaluating pedestrian needs and the strategies for addressing needs were identified through work with the City's Technical Advisory Committee.

Needs

Sidewalks are provided on a majority of the arterial and collector roadways (see Figure 5-1) in the City of Sherwood, resulting in a fairly good existing pedestrian network. Another important consideration is the availability and convenience for crossing arterial roadways, usually provided by pedestrian traffic signals at major intersections or a marked crosswalk at lower volume intersections. However, in many cases, the spacing between these marked and controlled crossings is designed to facilitate safe and efficient vehicular traffic flow rather than accessibility by pedestrian travelers. This can create unsafe situations where pedestrians cross arterials at mid-block locations without any controls.

The most important existing pedestrian needs in the City of Sherwood are providing sidewalks on arterials and collectors connecting key activity centers in the City. This includes the need for safe, well lighted arterials and collector streets with suitable pedestrian amenities for on-street and crossing facilities reducing the barriers to pedestrian travel. The City of Sherwood has made a policy decision to provide an extensive off-street trail system for pedestrians and bicyclists. The off-street trail system augments the roadway sidewalk facilities, primarily for recreational and longer walking and cycling trips. Connections between the trails and city streets should be emphasized to maximize the utility of the trail system.

Walkway needs in Sherwood 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, and 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 substantially less common (over 20 minutes). Service based trips require direct, conflict-free 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 within one-half mile. Recreational walking trips have different needs. Off-street trails, well landscaped sidewalks and relationships to unique environment (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 Sherwood and in compliance with the Americans with Disabilities Act (at least four feet of unobstructed sidewalk).[1] Wider sidewalks may be constructed in commercial districts or on arterial streets. Additional pedestrian facilities may include accessways, pedestrian districts and pedestrian plazas.

> Accessway – A walkway that provides pedestrian and/or bicycle passage either between streets or from a street to a building or other destinations 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.

Metro has identified the area between Tualatin-Sherwood Road and 12th Street/Century Drive in north Sherwood and the historic downtown core as "town centers", meaning that they provide a pedestrian focus and attempt to encourage non-motorized forms of transportation for intra-area trips. Additionally, the City of Sherwood has designated the downtown as an overlay area[2], and includes such pedestrian amenities and traffic calming techniques as curbless streets and tight corners requiring vehicles to go slow in order to traverse the turn safely. The purpose of this downtown overlay is to make a traditionally auto dominated realm into a shared space atmosphere where the pedestrian is given just as much priority as the automobile.

In addition to the traffic calming techniques these pedestrian districts will provide, investment must also be made to enhance pedestrian accessibility to surrounding land uses through the provision of facilities and/or street crossing treatments. Guidelines for marking crosswalks or other pedestrian enhancements for street crossings are found in the Institute of Transportation Engineer's *Traffic Control Devices Handbook*[3].

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*.[4] Typically, the base sidewalk sizing for local streets should be six feet (clear of obstruction). The City has indicated a preference on neighborhood routes for sidewalks to be eight feet. The critical element is the effective width of the walkway. Because of street utilities and amenities, a six-foot walkway can be reduced to three feet of effective walking area. This is the greatest capacity constraint to pedestrian flow. Therefore, landscape strips should be considered on all walkways to reduce the impacts of utilities and amenities – retaining the full sidewalk capacity.

As functional classification of roadways change, so should the design of the pedestrian facilities. Collectors may need to consider minimum sidewalks 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). The City of Sherwood has made it a policy to include landscape strips for all rights of way regardless of functional classification. Additionally, the city prefers to have at least eight (8) foot sidewalks along arterials, collectors and neighborhood routes in residential and commercial areas.

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[1] *Americans with Disabilities Act*, Uniform Building Code.
[2] *Downtown Sherwood Streescape Master Plan*, City of Sherwood, 2003
[3] *Traffic Control Devices Handbook*, Institute of Transportation Engineers, 2001, Chapter 13.
[4] *Highway Capacity Manual*, Transportation Research Board, 2000; Chapter 18.

Criteria

A set of goals and policies were developed for this TSP to guide transportation system development in Sherwood (see Chapter 2). Several of these goals and policies pertain specifically to pedestrian needs:

Goal 1: Provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes serving all neighborhoods and businesses.

- Policy 4 – The City shall encourage the use of more energy-efficient and environmentally-sound alternatives to the automobile by:
    - The designation and construction of bike paths and pedestrian ways.

Goal 3: Establish a clear and objective set of transportation design and development regulations that addresses all elements of the city transportation system and that promote access to and utilization of a multi-modal transportation system.

- Policy 6 – The City shall adopt roadway design guidelines and standards that ensure sidewalks and bikeways be provided on all arterial and collector streets for the safe and efficient movement of pedestrians and bicyclists between residential areas, schools, employment, commercial and recreational areas.

Goal 4: Develop complementary infrastructure for bicycles and pedestrian facilities to provide a diverse range of transportation choices for city residents.

- Policy 1 – The City of Sherwood shall provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes.
- Policy 2 – Sidewalks and bikeways shall be provided on all arterial and collector streets for the safe and efficient movement of pedestrians and bicyclists between residential areas, schools, employment, commercial and recreational areas.
- Policy 3 – The City of Sherwood will pursue development of local and regional pedestrian trail facilities, especially a trail system connection between the city and the Tualatin National Wildlife Refuge.

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

Strategies

Several strategies were developed for future pedestrian projects in Sherwood. These strategies are aimed at providing the City with priorities to direct its funds towards pedestrian projects that meet the goals and policies of the City.

Strategy 1 - "Connect Key Pedestrian Corridors to Schools, Parks, Recreational Uses, Transit Centers and Activity Centers"

This strategy provides sidewalks leading to activity centers in Sherwood, such as schools and parks and can include an extensive off-street trail network. It provides added safety on routes to popular pedestrian destinations by separating pedestrian flows from auto travel lanes. These routes are also common places that children and elderly individuals may walk to and from activity centers. A quality pedestrian (and bicycle) system close to transit centers is an important aspect of attracting and retaining transit riders.

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.

Strategy 2 - "Fill in Gaps in the Network Where Some Sidewalks Exist"

This strategy provides sidewalks that fill in the gaps between existing sidewalks where a substantial portion of a pedestrian corridor already exists. This strategy maximizes the use of existing pedestrian facilities to create complete section of an overall pedestrian network. These on-street pedestrian facilities can be complemented with the off-street trail system.

Strategy 3 - "Coordination of Land Use Approval Process to Provide Sidewalks and Links to Existing Sidewalks"

This strategy uses the land use approval process to ensure that sidewalks are provided adjacent to new development and that links from that new development to existing sidewalks are evaluated. If there are existing sidewalks in close proximity, the developer will be required to extend the sidewalk adjacent to the new development to meet the existing nearby sidewalk. The development shall use the pedestrian master plan as a basis for determining adjacent sidewalk placement. To effectively implement this strategy, close proximity shall be determined to be within 300 feet of the proposed development. In addition, if extension is not found to be roughly proportional to the development, the City shall add this to future years Capital Improvement Program candidate project list.

Strategy 4 - "Improved Crossings"

This strategy focuses on ensuring that safe street crossing locations are available, particularly along high traffic volume streets or locations where there is high pedestrian traffic (i.e., adjacent to schools, activity centers, etc.) and can include such pedestrian amenities as raised crosswalks, curb extensions or pedestrian signals.

Strategy 5 - "Pedestrian Corridors that Connect to Major Recreational Uses"

This strategy provides a connection between the sidewalk network and major recreational facilities, such as the many parks in the Sherwood area, the current off-street trail system, etc.

Strategy 6 - "Reconstruct All Existing Substandard Sidewalks to City of Sherwood Standards"

This strategy focuses on upgrading any substandard sidewalks to current city standards. Current standards are for six-foot sidewalks. Sidewalks that do not meet the minimum six-foot requirement should be widened. Fronting property owners are responsible for sidewalk maintenance where pavement has fallen into disrepair.

Table 5-1 provides an assessment of how each of the strategies meets the requirements of the goals and policies related to pedestrian facilities.

Table 5-1: Pedestrian Facility Strategies Comparisons

	Policies					
Strategy	1-4	3-6	3-13	4-1	4-2	4-3
1. Connect Key Pedestrian Corridors to Schools, Parks, Recreational Uses, Transit Centers and Activity Centers	□	■	□	□	□	●
2. Fill in Gaps in the Network Where Some Sidewalks Exist	□	□	●	□	□	□
3. Coordination of Land Use Approval Process to Provide Sidewalks and Links to Existing Sidewalks	□	●	■	□	●	□
4. Improved Crossings	●	●	□	●	□	❍
5. Pedestrian Corridors that Connect to Major Recreational Uses	□	□	●	□	■	●
6. Reconstruct All Existing Substandard Sidewalks to City of Sherwood Standards	□	❍	●	●	●	●

■ Fully meets criteria
□ Mostly meets criteria
● Partially meets criteria
❍ Does not meet criteria

Pedestrian Facility Plan

A list of likely actions to achieve fulfillment of these strategies was developed into a Pedestrian Master Plan. The Master Plan (Figure 5-1) is an overall plan and summarizes the 'wish list' of pedestrian related projects in Sherwood. From this Master Plan, a more specific shorter term, Action Plan was developed. The Master Plan elements recommending new facilities, both sidewalks, and off-street trails, are consistent with the RTP designations. Additional local facilities and crossing enhancements in this plan extend beyond the regional scope of the RTP.

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.

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). In the case of significant stretches where sidewalk is only provided on one side of the road, particular emphasis should be placed on developing safe crossing locations. Development will 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 are the ultimate desire.

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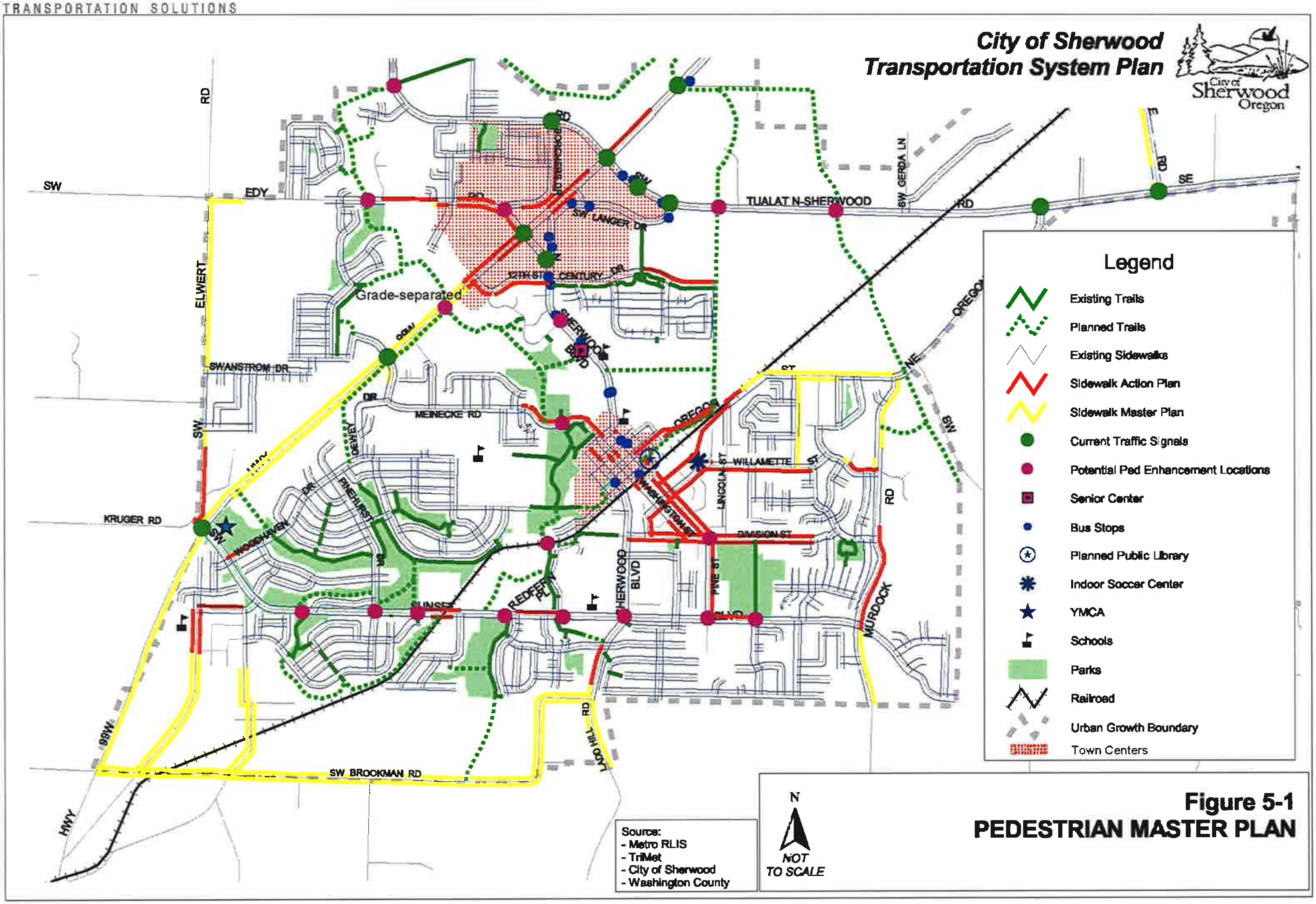

Figure 5-1
PEDESTRIAN MASTER PLAN

Project List

Table 5-2 outlines potential pedestrian projects in Sherwood. The City, through its Capital Improvement Program (CIP), joint funding with other agencies (Washington County, ODOT) and development approval would implement the projects. The following consideration should be made for each sidewalk installation:

Every attempt should be made to meet City standards.

All sidewalks should be a minimum of six feet wide.

Landscape strips are required (see standard street cross-sections in the Motor Vehicles chapter).

Action Plan Projects

Table 5-2 summarize the Pedestrian Action Plan, which are shown on Figure 5-1.

Table 5-2: Action Plan Pedestrian Projects

Street	Side	From	To	Length (feet)
12th Street	South	Hwy 99W	Sherwood Boulevard	1,300
Borchers Drive	North	Borchers Drive	Houston Drive	
Century Drive	North	Baler Way	Adams Avenue	1,200
Division Street	Both	Sherwood Boulevard	Cuthill Place	3,000
Edy Road	South	Hwy 99W	Terrapin Drive	2,300
Edy Road	North	Borchers Drive	Houston Drive	600
Elwert Road	East	Hwy 99W	Orchard Hill Lane	1,300
Hwy 99W	East	UGB	Sunset Boulevard	2,800
Hwy 99W	East	12th Street	Sherwood Boulevard	650
Hwy 99W	East	Sherwood Boulevard	Tualatin-Sherwood Rd	550
Hwy 99W	West	12th Street	Sherwood Boulevard	1,100
Hwy 99W	West	Sherwood Boulevard	Tualatin-Sherwood Rd	850
Hwy 99W	West	Tualatin-Sherwood Rd	North	1,000
Main Street	North	2nd Street	3rd Street	300
Meinecke Road	North	3rd Street	Lee Drive	1,500
Murdock Road	East	City Limits	Division Street	1,700
Oregon Street	North	Murdock Street	Ash Street	2,000
Pacific Highway	Both	UGB	Timbrel Lane	1,500
Pine Street	Both	Division Street	Railroad	1,300
Pine Street	East	Division Street	Sunset Boulevard	1,200
Pine Street	East	Oregon Street	Railroad	200
Roy Street	North	Murdock Road	Cochran Drive	600
Sherwood Boulevard	West	Willow Drive	UGB	800
Sunset Boulevard	North	Pine Street	Aldergrove	750
Sunset Boulevard	North	Saint Charles Way	Redfern Drive	750
Sunset Boulevard	South	Greengate Way	West	700
Sunset Boulevard	North	Greengate Way	West	300

Street	Side	From	To	Length (feet)
Timbrel Lane	North	Pacific Highway	Middleton Road	750
Washington Street	Both	Division Street	Tualatin Street	450
Washington Street	Both	Columbia Street	Oregon Street	350
Washington Street	Both	2nd Street	South	200
Willamette Street	South	Roy Street	Division Street	3,500

Arterial Crossing Enhancements

Pedestrian safety is a major issue. 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 Sherwood School District as well as the City to be effective. The 'Safe Routes to School' program attempts to provide walking and bicycling infrastructure, encouraging children to walk and bike to school in an effort to improve safety and reduce traffic and air pollution in the vicinity of schools.

Several "pedestrian crossing evaluation" locations were identified during the preparation of the Pedestrian Master Plan and on the Pedestrian Action Plan. A screening evaluation was done for arterial streets within Sherwood to identify roadway segments that should be considered for enhanced pedestrian crossing treatments. The criterion used was based on roadway daily volumes, posted speeds, and proximity to pedestrian generators based on published guidelines[5] in the *Traffic Control Devices Handbook*. Enhancements may include a raised median island, or a pedestrian activated signal, if warranted, for the sole purpose of allowing pedestrians to cross the roadway. The crossing type in the rightmost column of Table 5-3 indicates whether enhancements are optional (type B) or mandatory (type C) for the specified location. Locations with a type A indication note that standard crosswalk controls are sufficient[6]. Further site specific study is required to determine the appropriate crossing design at each location with a type B rating.

[5] *Traffic Control Devices Handbook*, Institute of Transportation Engineers, 2001; Chapter 13, Table 13-2.
[6] See pages 5-10.

Table 5-3: Pedestrian Crossing Enhancement Locations

Intersection	2003 Daily Volume	Posted Speed	Number Travel Lanes	Crossing Type (1)
Edy Road and Cedar Creek Trail	500	40	2	B
Edy Road and Borchers Drive	800	40	2	B
Tualatin-Sherwood Road and Adams Drive	1,600	45	3	B
Sherwood Boulevard and Gleneagle Drive	1,100	25	3	A
Meinecke Road and Existing Trail	300	25	2	A
Pine Street and Division Street	300	25	2	A
Pine Street and Sunset Boulevard	800	35	2	A
Sunset Boulevard and Sherwood Boulevard	1,300	35	2	A
Sunset Boulevard and Saint Charles Way	700	35	2	A
Sunset Boulevard and Redfern Drive	700	35	2	A
Sunset Boulevard and Galewood Drive	700	35	2	A
Sunset Boulevard and Aldergrove	700	35	2	A
Sunset Boulevard and Pinehurst	700	35	2	A
Cedar Creek off street trail and railroad tracks	N/A	N/A	N/A	C
Rock Creek off street trail and Tualatin-Sherwood Road	1,600	45	3	B
Roy Rodgers Road and off street trail	1,300	35	3	A
99W and off street trail	3,200	45	5	B
Sunset Boulevard and Existing Trail	700	35	3	A

Notes:
(1) Crossing Type Categories: A = Candidate for marked crosswalk alone.; B = Marked crosswalk plus potential additional enhancements (e.g., raised median refuge, pedestrian traffic signal, etc.).; C = Marked crosswalk and mandatory additional enhancements.

For Category B crossings, there is a range of possible improvements than can be applied as illustrated and described in Table 5-4. Each crossing location should be reviewed to determine the appropriate combination of improvements. For example, curb extensions are effective for reducing crosswalk lengths, and exposure to conflicting vehicles, but these are only reasonable where on-street parking is provided on both sides of the roadway. The curb extension 'shadows' the parked cars. Another example is the pedestrian count down timers, which can only be applied at existing or new traffic signal controlled crossings. These examples represent a tool box of solutions for pedestrian enhancements[7]. Special emphasis should be given to the designated Overlay District within the Central Business District.

[7] A separate evaluation should be conducted to determine whether a marked crosswalk should be implemented at each of the locations identified in Table 5-3.

Table 5-4: Measures for Enhancing Pedestrian Crossings

Improvement	Description	Illustration	Cost Range
Marked Crosswalk	White, thermoplastic markings at street corner. Alternative material could include non-white color or textured surfaces.		$500 to $1,000 each crossing
Raised Crosswalk	Crosswalks that are level with the adjacent sidewalks, making pedestrians more visible to approaching traffic.		$4,000
New Corner Sidewalk Ramp	Construct ADA compliant wheelchair ramps consistent with city standards		$3,000 to $5,000 each corner
Median Refuge	Construct new raised median refuge area. Minimum width 6 feet, and minimum length of 30 feet. Curb can be mountable to allow emergency vehicles to cross, if required.		$3,000 to $10,000 depending on overall length and amenities.
Pedestrian Count Down Timer Signal	Install supplemental pedestrian signal controls to indicate the time remaining before crossing vehicles get 'green' signal indication.		$500 each signal head

Improvement	Description	Illustration	Cost Range
Curb Extensions	Construct curb extension on road segments with on-street parking. Reduces pedestrian crossing area, and exposure to vehicle conflicts.		$5,000 to $8,000 depending on design amenities and aesthetic treatments.
Mid-Block Pedestrian Signal and Crossing	Construct new pedestrian signal that is synchronized with major street traffic progression to reduce interruption of through traffic. Appropriate near high pedestrian generators.		$100,000 to $150,000

Address Gaps in Pedestrian System

Recent annexation of land into the urban growth boundary has left some arterial and collector streets with no sidewalk frontage. Additionally, there are small gaps in the system throughout the city and in the old town area. In an effort to provide adequate pedestrian infrastructure, land developers in the City of Sherwood are required to build sidewalks on project frontages. However, developers often have little means or incentive to extend sidewalks beyond their property. Additionally, 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 $20,000 to $25,000 per year could build over a quarter mile of sidewalk to help fill gaps. 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.
- Matching funds with adjacent land owners that front the proposed sidewalk.
- Reimbursement agreements with developers

Parks and Trail Development

The City of Sherwood has planned for the extensive use of off-street, multi-use trails that will provide both recreational activities and non-motorized infrastructure. The city currently has approximately 5.4 miles of off-street trails and is planning an additional 10 miles over the next 20 years. Many of the parks within Sherwood are currently traversed by these trails, and the additional infrastructure will provide linkages between existing trails and parks. Some segments of the off-street trail system will serve as major pedestrian/bicycle corridors, such as the Adams Street pedestrian/bicycle trail, and will connect many destinations within the City of Sherwood. These additional pedestrian and bicycle infrastructure facilities will help to augment the on-street pedestrian facilities such as sidewalks and pedestrian crossings located on arterial and collector streets throughout the city.

Complementing Land Use Actions

Land use actions enable significant improvements to the pedestrian system to occur. A change in land use from vacant or under utilized land creates two key impacts to the pedestrian system:

- Added vehicle trips that conflict with pedestrian flows
- Added pedestrian volume that requires safe facilities

The above mentioned impacts require mitigation to maintain a safe pedestrian system. Pedestrians walking in the traveled way of motor vehicles are exposed to potential conflicts that can be minimized or removed entirely with sidewalk installation. The cost of a fronting sidewalk to an individual single family home would be roughly $1,000 to $2,000 (representing less than one percent of the cost of a house). Over a typical 50-year life of a house, this would represent less than $50 per year assuming that cost of money is 4% annually. This cost is substantially less than the potential risk associated with the cost of an injury accident or fatality without safe pedestrian facilities (injury accidents are likely to be $10,000 to $50,000 per occurrence and fatalities are $500,000 to $1,000,000). Sidewalks are essential for the safety of elderly persons, the disabled, transit patrons and children walking to school, a park or a neighbor's house. No area of the city can be isolated from the needs of these users (not residential, employment areas or shopping districts). Therefore, fronting improvements including sidewalks are required on every change in land use or roadway project.

For any developing or redeveloping property in Sherwood, the cost savings to the private developer is the only benefit of not providing sidewalks – at the potential risk and future expense to the public. Therefore, sidewalks are required in Sherwood with all new development and roadway projects.

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 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.

6. Bicycle Plan

This chapter summarizes existing and future facility needs for bicycles in the City of Sherwood. 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 Sherwood.

Needs

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. Where walking trips are attractive at lengths of a quarter mile (generally not more than a mile), bicycle trips are attractive up to three miles. Bicycle trips can generally fall into three groups: commuting, 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 arterials and collectors. Their needs are for lower volume/speed traffic streets, safety and connectivity. It is important for bicyclists to be able to use through streets[1]. 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. Typically, these bike trips will exceed the normal bike trip length.

The existing bike lane system on arterial and collector streets and off-street trails does not provide adequate connections from neighborhoods to schools, parks, retail centers, or transit stops. Continuity and connectivity are key issues for bicyclists and the lack of facilities (or gaps) cause significant problems for bicyclists in Sherwood. Without connectivity of the bicycle system, this mode of travel is severely limited. Local streets do not require dedicated bike facilities since the lower motor vehicle volumes and speeds typically allow for both autos and bikes to share the roadway. Cyclists desiring to travel through the City generally either share the roadway with motor vehicles on major streets or find alternate routes on lower volume local streets. There are designated on-street bike facilities along Tualatin-Sherwood Road and Highway 99W within the Sherwood City limits. Additionally, short segments along Edy Road, Sherwood Boulevard, Roy Rodgers Road, Meineke Road, and Oregon Street have existing on-street bike lane facilities. There are also several multi-use paths that can be used by both pedestrian and bicycle travelers. These paths currently provide recreational opportunities at the various park locations throughout the city, but do not yet provide a cohesive, connected bicycle network.

[1] This can include end of cul-de-sac connections, but even better is regular spacing of local streets.

Facilities

Bicycle facilities are comprised of two primary categories:

- route facilities
- parking facilities

Route Facilities

Bicycle lanes (or trails) are the most common type of bicycle route facilities in Sherwood. There are three main bicycle route facility types: 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 lanes adjacent to the curb are preferred to bicycle lanes adjacent to parked cars or bicycle lanes combined with sidewalks. According to the Oregon Bicycle and Pedestrian Plan[2], on-street bike lanes should be six-feet wide. Provision of a bicycle lane not only benefits bicyclist but also motor vehicles which gain greater shy distance/emergency shoulder area. Additionally, pedestrians gain a buffer between walking areas and moving vehicles. On reconstruction projects, bicycle lanes of five feet may be considered due to right-of-way constraints.

Bicycle accommodations are where bicyclists and autos share the same travel lane, including a wider outside lane and/or bicycle boulevard treatment (priority to through bikes on local streets). Widening the curb travel lane (for example, from 12 feet to 14 or 15 feet) can provide bicycle accommodations. This extra width is more accommodating to bicycle travel and provides a greater measure of safety.

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.). Wide sidewalks (greater than eight feet), can also be considered multi-use paths, however, the provision of wide sidewalks should not preclude the provision of on-street bike lanes. The shared space on the wide sidewalks can decrease pedestrian levels of service as well as pose adverse safety problems for both bikers and pedestrians. Off-street trails in the City of Sherwood should be planned for 10-12 feet in width[3], which is desirable for mixed-use activity (pedestrian and bike).

Parking Facilities

Racks, lockers and shelters are typical bicycle parking facilities and are provided at individual land use sites. The provision, or lack there of, parking facilities can have a significant effect on bicycle ridership, especially for individuals attempting to use the bicycle as an alternative form of transportation to the automobile.

Signing and marking of bicycle lanes should follow the *Manual on Uniform Traffic Control Devices*. Design features in the roadway can improve bicycle safety. For example, using curb storm drain inlets rather than catch basins significantly improves bicycle facilities. This

[2] Oregon Department of Transportation, *Oregon Bicycle and Pedestrian Plan*, Adopted June, 1995.
[3] Ibid.

technique is being implemented with the City of Sherwood downtown streets plan.

Criteria

The city has developed a set of goals and policies to guide transportation system development in Sherwood (see Chapter 2) as part of this TSP. Several of these policies pertain specifically to bicycle needs:

Goal 1: Provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes serving all neighborhoods and businesses.

- Policy 4 – The City shall encourage the use of more energy-efficient and environmentally-sound alternatives to the automobile by:
    - The designation and construction of bike paths and pedestrian ways.

Goal 3: Establish a clear and objective set of transportation design and development regulations that addresses all elements of the city transportation system and that promote access to and utilization of a multi-modal transportation system.

- Policy 6 – The City shall adopt roadway design guidelines and standards that ensure sidewalks and bikeways be provided on all arterial and collector streets for the safe and efficient movement of pedestrians and bicyclists between residential areas, schools, employment, commercial and recreational areas.

Goal 4: Develop complementary infrastructure for bicycles and pedestrian facilities to provide a diverse range of transportation choices for city residents.

- Policy 2 – Sidewalks and bikeways shall be provided on all arterial and collector streets for the safe and efficient movement of pedestrians and bicyclists between residential areas, schools, employment, commercial and recreational areas.
- Policy 3 – The City of Sherwood will pursue development of local and regional pedestrian trail facilities, especially a trail system connection between the city and the Tualatin National Wildlife Refuge.
- Policy 5 – The City of Sherwood shall include requirements for the provision of bicycle parking on large commercial, industrial, and multi-family residential projects.
- Policy 6 – The City of Sherwood will coordinate the bikeway system with adjacent jurisdictions, especially Tualatin, Wilsonville, Clackamas and Washington County.

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

Strategies

Several strategies were considered for construction of future bikeway facilities in Sherwood. These strategies are aimed at providing 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 – "Connect Key Bicycle Corridors to Schools, Parks, Transit Centers and Activity Centers"

This strategy provides bikeway links to schools, parks, recreational facilities and activity centers from the arterial/collector bikeway network. This strategy provides added safety to likely bicyclist destinations as well as destinations where children are likely to travel. Examples would include Sunset Boulevard, Sherwood Boulevard, Meinecke Road and the off-street multi-use paths throughout Sherwood. As with pedestrian facilities, bicycle facilities are important to provide access to transit centers and major transit stops. Most of the transit system's riders begin or end their trip either as a pedestrian or cyclist.

Strategy 2 - "Bicycle Corridors that Connect to Major Recreational Facilities"

This strategy provides a connection between the bikeway network and major recreational facilities. An example would be the Adams Street Trail.

Strategy 3 - "Fill in Gaps in the Network where Some Bikeways Exist"

This strategy provides bikeways that 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 4 - "Develop Maintenance Program to Clean Bike Lanes"

This strategy establishes a program to provide maintenance services to clean the bike lanes. Debris in bike lanes is one of the biggest complaints (deterrents) of bicyclists.

Strategy 5 - "Bicycle Corridors that Commuters Might Use"

This strategy focuses on providing bicycle facilities where commuters are likely to go such as local (within Sherwood) or regional (i.e. Tualatin, Tigard, Portland) employment centers or leading to transit that provides access to regional employment centers.

Strategy 6 - "Bicycle Corridors that Connect Neighborhoods"

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

Strategy 7 - "Construct All Bikeways to City of Sherwood Standards"

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

Table 6-1 provides an assessment of how each of the strategies meets the requirements of the goals and policies related to bicycle facilities.

Table 6-1: Bicycle Facility Strategies Comparisons

	Policies					
Strategy	**1-4**	**3-6**	**4-2**	**4-3**	**4-5**	**4-6**
1. Connect Key Bicycle Corridors to Schools, Parks, Recreational Uses, Transit Centers and Activity Centers	□	■	■	■	□	●
2. Bicycle Corridors that Connect to Major Recreational Uses	□	□	□	□	□	●
3. Fill in Gaps in the Network where Some Bikeways Exist	●	●	□	●	□	○
4. Develop Maintenance Program to Clean Bike Lanes	○	○	●	●	●	○
5. Bicycle Corridors that Commuters Might Use	■	□	■	■	●	○
6. Bicycle Corridors that Connect Neighborhoods	□	■	□	□	□	●
7. Construct All Bikeways to City of Sherwood Standards	●	□	●	●	□	■

■ Fully meets criteria
□ Mostly meets criteria
● Partially meets criteria
○ Does not meet criteria

Table 6-2 summarizes the bicycle corridors created by overlaying the bicycle network over the arterial and collector system in Sherwood.

Table 6-2: Corridors in Bikeway Network

North-South Corridors	East-West Corridors
Sherwood Boulevard	Sunset Boulevard
Murdock Road	Meinecke Road
Adams Road	Edy Road

Since bicyclists can generally travel further distances than pedestrians, connections that lead to regional destinations such as Tualatin and Tigard, as well as providing the opportunity for individuals to make intracity recreational and work related trips via bicycle are important. Sherwood's bicycle network should connect to surrounding agencies bicycle networks so as to provide regional, non-motorized connectivity. Key locations where connections should be made to these other jurisdiction's networks are shown in Table 6-2.

Table 6-3: Bicycle Connectivity to Adjacent Jurisdictions

Jurisdiction	Interface Street	Link Included in Sherwood Bike Master Plan
Tigard	Highway 99W	Highway 99W
Tualatin	Tualatin-Sherwood Road	Cipole Road
Clackamas County	Ladd Hill Road	Sherwood Boulevard
	Baker Road	Murdock Road
Washington County	Roy Rodgers Road	Roy Rodgers Road
	Edy Road	Edy Road

Bicycle Facility Plan

A list of likely actions to achieve fulfillment of these priorities was developed into a Bicycle Master Plan. The Bicycle Master Plan is an overall plan and summarizes the list of bicycle-related projects in Sherwood, 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 consists of projects that the City should actively try to fund. These projects form a basic bicycle grid system for Sherwood. As development occurs, streets are rebuilt (Oregon law requires that bikeways be provided wherever streets or roadways are constructed or reconstructed) and other opportunities (such as grant programs) arise, projects on the Master Plan should be pursued as well. The Master Plan elements considered bicycle facilities identified in the adopted Regional Transportation Plan[4]. New facilities, on-street bike lanes, and off-street trails, are consistent with the RTP bike route designations. Additional bike facilities within the city streets are in this plan that extend beyond the regional scope of the RTP.

The City of Sherwood places a large emphasis on the provision of off-street trails and paths as a means to provide non-motorized transportation alternatives. Facilities such as the Adams Street off-street bicycle and pedestrian trail augment the gridded, bicycle frame-work that is outlined in this TSP. North/South and East/West corridors have been designated in an effort to connect the major traffic generating districts within the City of Sherwood, as well as linking the many off-street paths and trails in order to provide a complete and cohesive non-motorized network. For regional bicycle trips, TriMet provides bike racks on their buses, allowing bikers to utilize non-motorized, bicycle transportation at the beginning and end of their trips.

[4] Metro, 2000 *Regional Transportation Plan*, Adopted August 2000.

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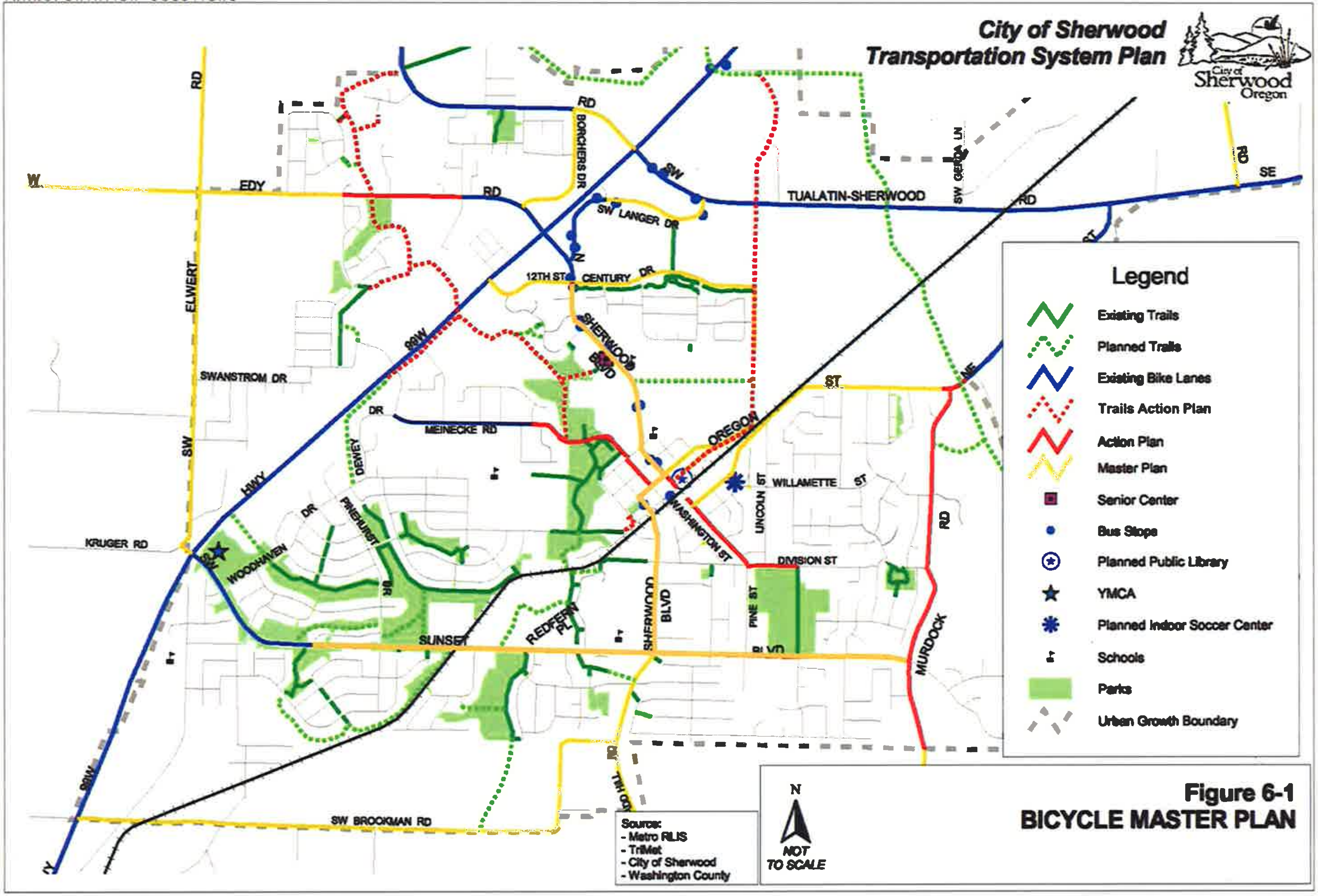

Figure 6-1
BICYCLE MASTER PLAN

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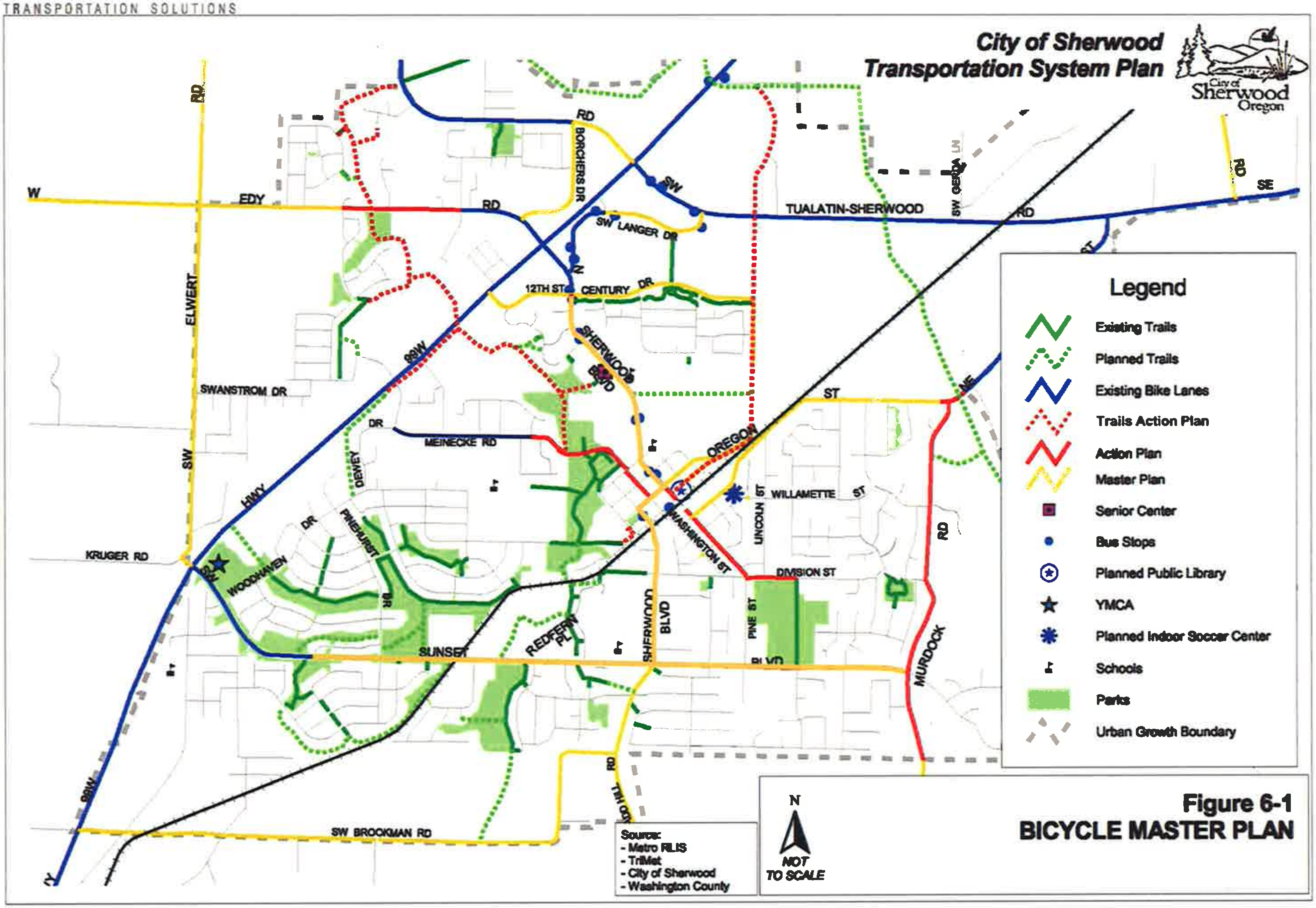

Figure 6-1
BICYCLE MASTER PLAN

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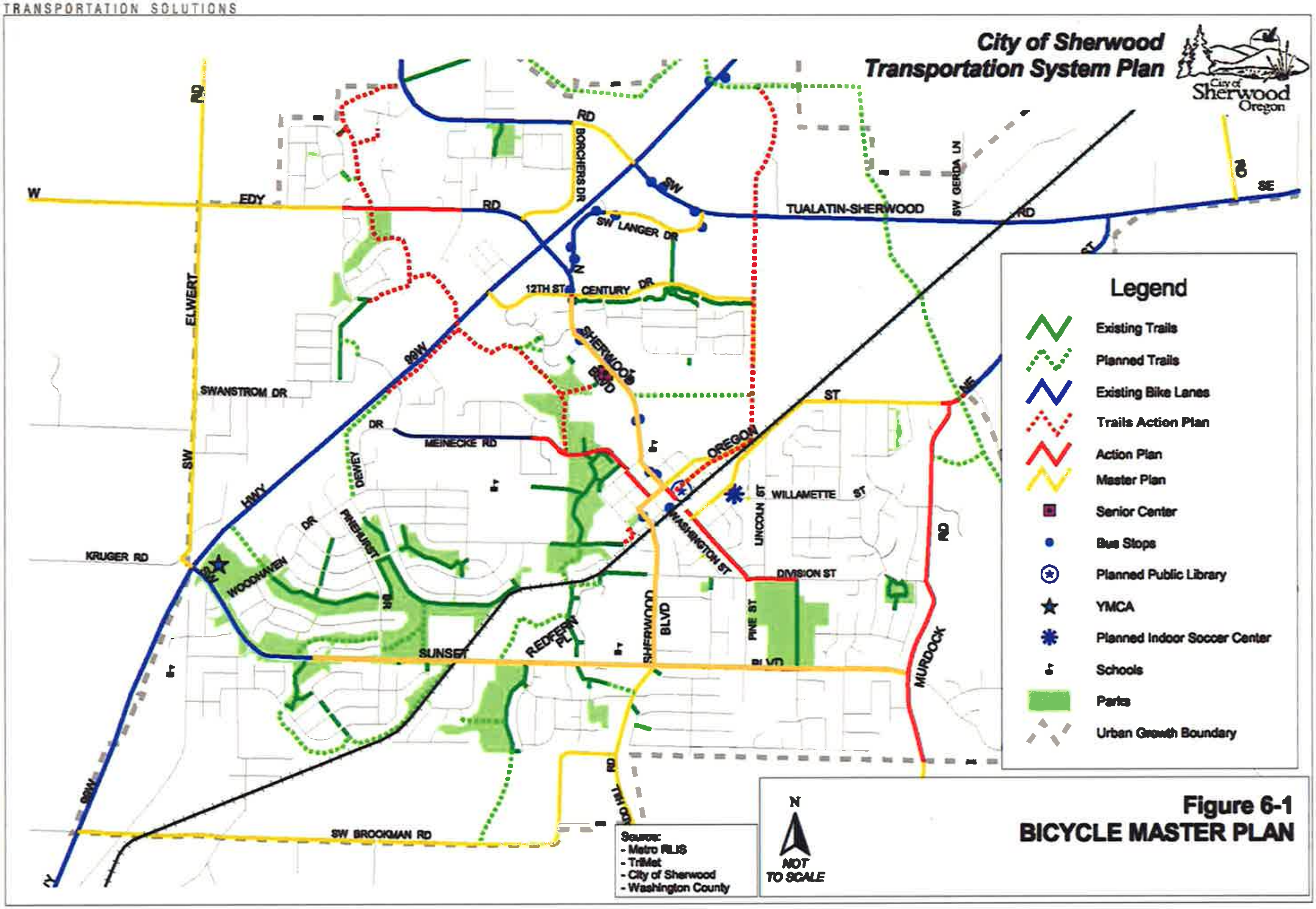

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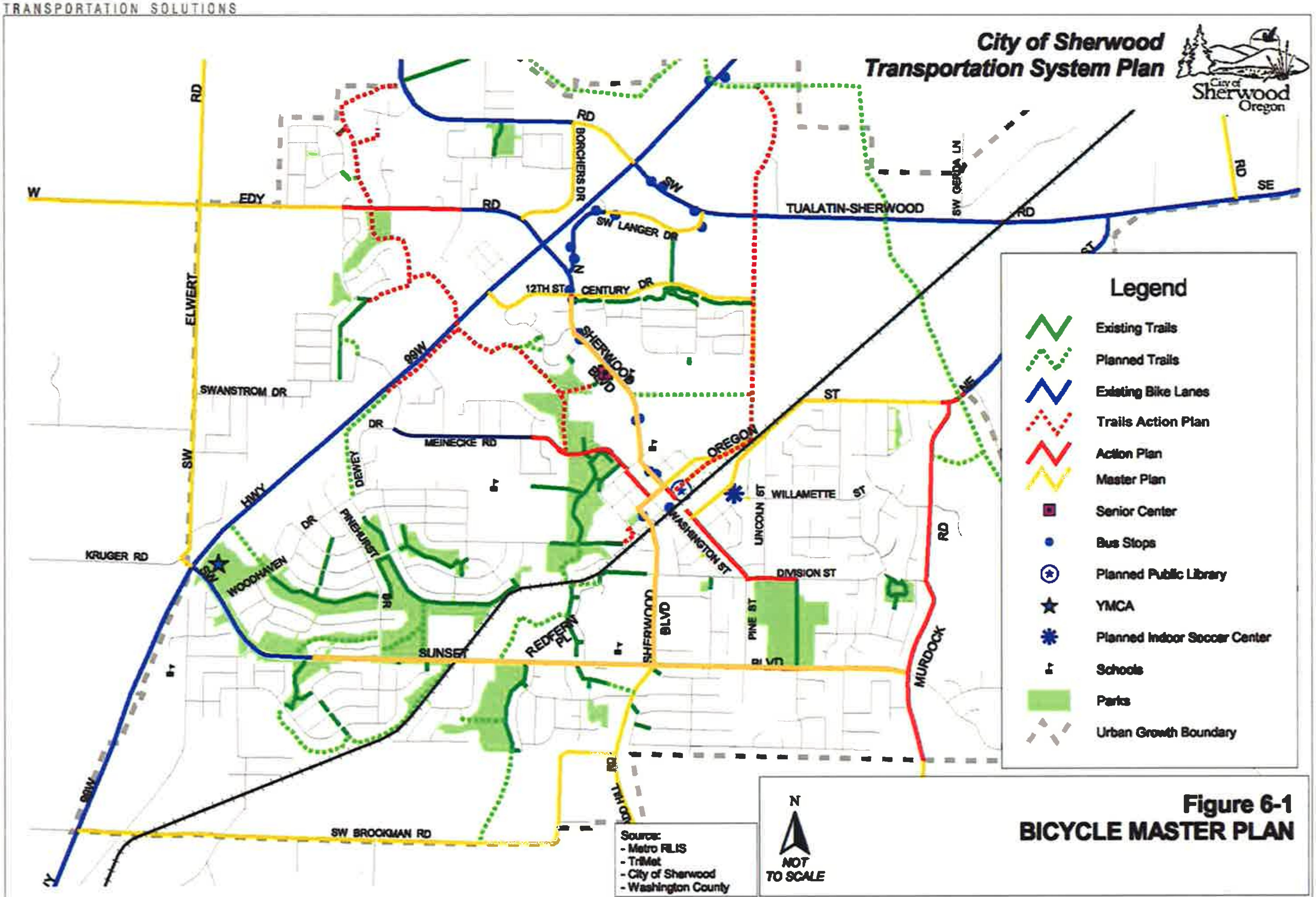

Figure 6-1

BICYCLE MASTER PLAN

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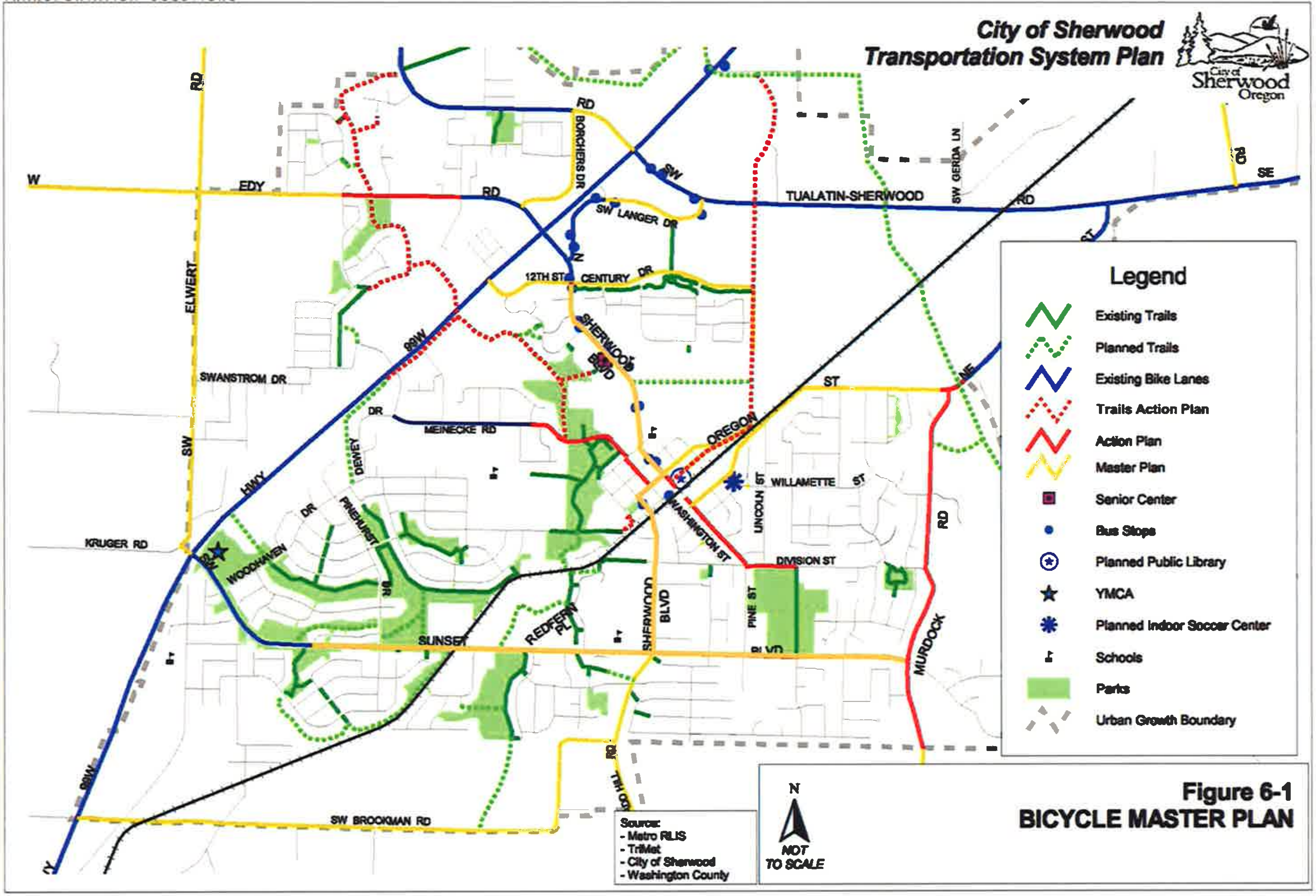

Figure 6-1
BICYCLE MASTER PLAN

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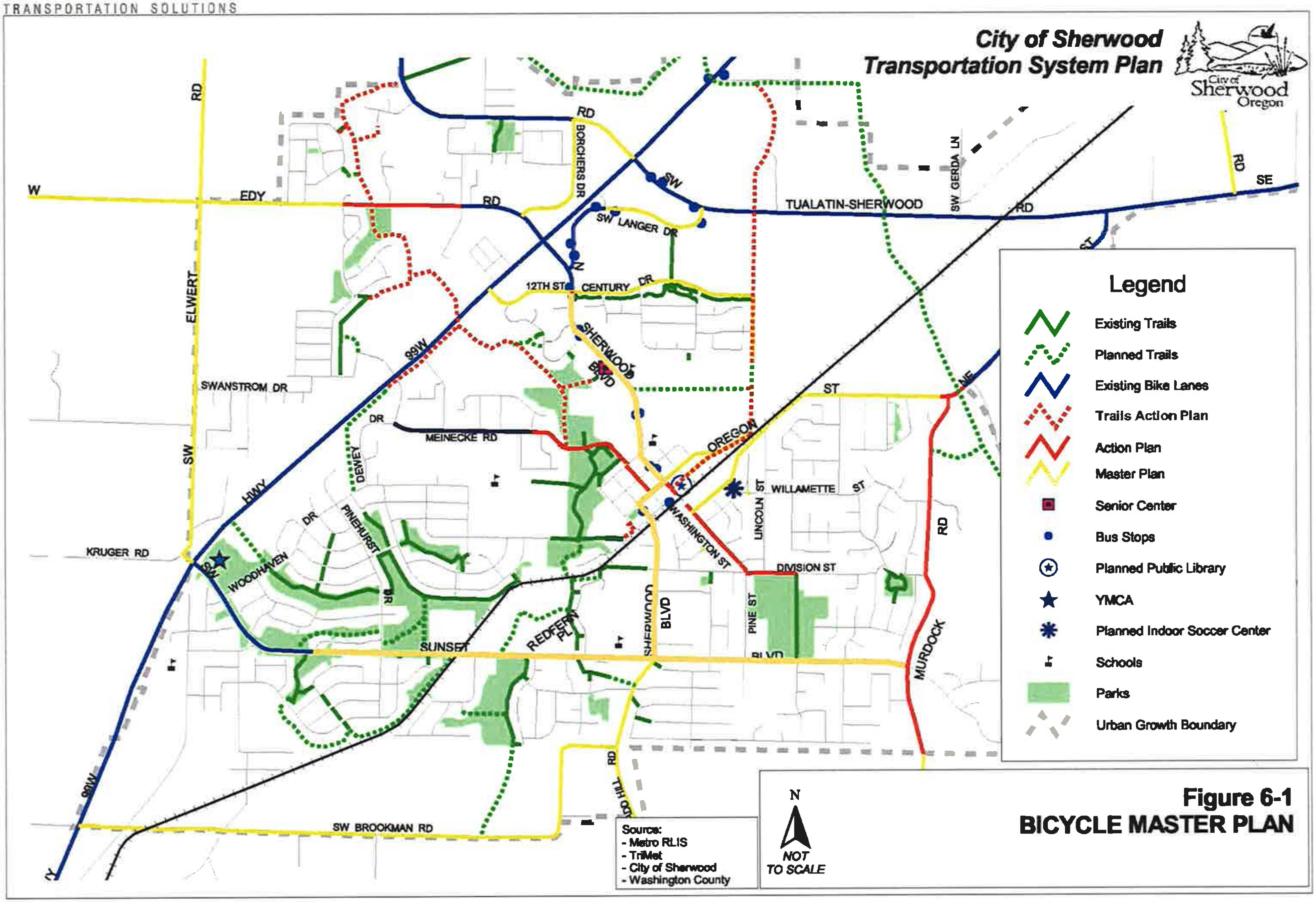

Figure 6-1
BICYCLE MASTER PLAN

Project List

Table 6-4 outlines planned bicycle projects in Sherwood. The City, through its Capital Improvement Program (CIP), along with joint funding with other agencies such as ODOT and Washington County would implement these projects. Wherever possible, 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 6-4: Bicycle Action Plan Projects

Street	From	To	Length (ft)
Murdock Road	Urban Growth Boundary	Oregon Street	5,600
Meinecke Road	Highway 99W	1st Street	5,000
Snyder Street	Stevens Dr.	Off street trail	
Pine Street	1st Street	Off street trail	2,500
Off Street Bike Facilities			
	Roy Rodgers	Meinecke Road	11,500
	Villa Road	1st Street	650
	99W	1st Street	6,600
	Urban Growth Boundary	Roy Rodgers Road	4,100
	Urban Growth Boundary	Tualatin-Sherwood Road	3,300
	Tualatin-Sherwood Road	Sherwood Boulevard	4,600
	Sherwood Boulevard	Adams Street	1,700
	Tualatin-Sherwood Road	Urban Growth Boundary	4,800
	Highway 99W	Woodhaven Drive	1,000
	Steller Drive	Sunset Boulevard	1,600
	Sunset Boulevard	Saint Charles Way	1,500
	Saint Charles Way	Villa Road	1,200
	Ladd Hill Road	Existing Trail	450
	Sunset Road	Inkster Drive	3,500
	Highway 99W	Redfern Drive	7,800

Complementing Land Use Actions

The City, through its Zoning Code, has in place recommendations for bicycle parking. The existing code specifies that on-site bicycle parking facilities must be located within fifty feet of an entrance to a building. The code continues by providing a recommended number of bicycle parking spaces for land use categories including residential, commercial, industrial, service and other categories. While the code does provide some guidance for the provision of bicycle infrastructure, it is rather nebulous. Since the provision of a bicycle network will not be fully utilized without the supporting infrastructure, it is in the City's best interest to make bicycle options available. This section of code be expanded to include bike-parking facilities requirements as opposed to recommendations.

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 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.

7. TRANSIT

This chapter summarizes existing and future transit needs in the City of Sherwood. The following sections outline the criteria used to evaluate needs, strategies for implementing a transit plan and the transit plan for the City of Sherwood. The method used to develop the transit plan combined TriMet, city staff and other agencies input.

Needs

TriMet is the regional transit provider for the Portland area and operates the fixed route transit service in Sherwood, which is located in the southwest corner of TriMet's service area. Due to its geographic location, Sherwood is the end point for the regional service system. Three lines serve Sherwood including:

- Route 12- Barbur Boulevard
- Route 94- Sherwood/Pacific Highway Express
- Route 95- Tigard/1-5 Express

All three lines follow the same route, traveling along Highway 99W, Tualatin-Sherwood Road, Langer Drive and Sherwood Boulevard before terminating in old town Sherwood. Within the City of Sherwood boundaries there are two park and ride lots and 22 bus stops. Route 12 is designated as a Tier III priority candidate for frequent service (meaning buses are scheduled to arrive 15 minutes apart 7 days a week) by TriMet. However, TriMet predicts it will be approximately ten (10) years before this service is put into place due to the Tier III distinction, which designates the service upgrade as lower priority than those routes with a Tier I or Tier II distinction. Route 94 is only operational during the weekday peak hours and strictly serves the two park and ride lots in Sherwood. Route 95 operates during the weekday peak hours, but differs from Route 94 in that it stops at all designated locations in Sherwood. Additionally, Link Bus Transportation offers morning, afternoon and evening service from McMinnville to Sherwood, connecting to the TriMet bus system.

Minimum density required to support a fixed route transit bus service with 1-hour scheduled between arrivals is about four (4) housing units an acre. Many of the neighborhoods in the City of Sherwood have the minimum density required to support fixed route transit, but are not currently covered by the regional system. The most notable needs for transit service in Sherwood is in the southern section of the city. Not only does this area currently have the density required to support fixed route transit, it has recently been expanded with the adoption of Metro's updated Urban Growth Boundary and should be planned with high enough densities to support transit service. While this minimum density serves as a threshold, it alone does not justify service provision. Other factors must be considered such as the regional priority for expansion of routes, and the establishment of funding. The city must work with TriMet and other stakeholders in order to determine actual service needs and determine how those needs will be met. Since many of the residents of Sherwood work in other municipalities in the metro region, providing commute options for Sherwood could play a significant role in reducing congestion for both the Sherwood area the Portland region.

The Transit Investment Plan, created to direct regional transit growth in the TriMet service area and provide a framework for how transit investments are made, provides a list of priorities for regional transit service[1] planning methods. These priorities are, in order:

1. Maintain the quality of the existing system
2. Grow the high capacity transit system
3. Expand the Frequent Service system
4. Improve local service

Priorities were established to direct investment for expansion of service and provision of amenities. According to the hierarchy, local service expansion routes in Sherwood receive the lowest priority for regional transit funds. However, local transit needs could be met through alternatives to fixed route expansion such as local shuttle services and/or vanpools or the phasing of local service capital projects within the Sherwood service area in partnership with TriMet.

Criteria

A set of goals and policies has been created to guide transportation system development in Sherwood (see Chapter 2). Several of these policies pertain specifically to transit needs:

Goal 1: Provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes serving all neighborhoods and businesses.

Policy 4 – The City will encourage the use of more energy-efficient and environmentally-sound alternatives to the automobile by:

- The scheduling and routing of existing mass transit systems and the development of new systems to meet local resident needs.

Policy 7 – The City of Sherwood will foster transportation services to the transportation disadvantaged including the young, elderly, handicapped and poor.

Goal 5: Provide reliable convenient transit service to Sherwood residents and businesses as well as special-transit options for the city's elderly and disabled residents.

Policy 1 – Public transportation will be provided as an alternative means of transportation in Sherwood.

Policy 2 – The City of Sherwood will work with TriMet to expand transit services to all parts of the City through additional routes, more frequent service, and transit oriented street improvements.

Policy 3 – Park-and-ride facilities should be located with convenient access to the arterial system to facilitate rider transfer to transit and car pools.

Policy 5 – The City of Sherwood will support the establishment of a "feeder" transit route from Sherwood to Tualatin employment centers.

Policy 6 – The City of Sherwood will support park-and-ride facilities that are sited for the maximum convenience of commuters and transit riders.

[1] *Transit Investment Plan* TriMet, 2003.

Policy 7 – The City of Sherwood will support regional efforts for the preservation and development of appropriate rail rights-of-way for passenger rail service, in particular for serving local and regional commuter rail needs in Washington County, Clackamas County and Yamhill County.

Policy 8 – The City of Sherwood will encourage the provision of special transportation services (i.e. van pools or car pools, dial-a-ride, etc.) to transportation disadvantaged by TriMet and community based service providers.

Policy 10 – The City will meet RTP goals of providing a safe and convenient pedestrian circulation system.

Strategies

TriMet is responsible for any changes in routes through their annual transit service plan process. In order for the City to have its transit needs assessed, the City can provide input to TriMet through this process.

Several strategies were developed for the implementation of future transit facilities in Sherwood. These strategies were developed to provide the City with priorities in providing guidance to TriMet since it is likely that the available funding will be insufficient to address all of the projects identified in the Transit Master Plan. These priorities are not necessarily in order.

Strategy 1 - "Provide Express Routes to Regional Employment Centers"

This strategy is aimed at providing service directly from Sherwood transit centers to regional employment centers such as Portland, Washington Square, the Sunset Corridor, the City of Tualatin and the City of Tigard. This might include a few local stops followed by express service to a central transit shelter or implementing a vanpool system for employees in these areas.

Strategy 2 - "Provide Bus Shelters/Improved User Amenities"

This strategy focuses on installation of bus shelters and other user amenities along bus routes in Sherwood. The need for bus shelters at bus stops, as well as other user amenities, should be evaluated in conjunction with any new commercial or residential development adjacent to a transit street. Typical daily boarding thresholds of 35 patrons or more could be used to support installation of a covered bus shelter and bench. One highly valued user amenity is "real time" bus schedule information at major bus stops, indicating how long it would be before the next bus arrives at a particular stop. This type of tracking system requires on-board bus GPS units, and a centralized control process, which are currently being installed on the TriMet bus fleet.

Strategy 3 - "Provide More Local Transit Service"

This strategy focuses on providing more transit service on routes that serve the Sherwood area. An assessment of existing transit route coverage in Sherwood was done comparing current and future placement of transit services in relationship to land use densities that would be supportive of transit use. The land use data from the travel demand forecast model was utilized in this assessment. A one-quarter mile "buffer" was established around each transit stop and compared to the adjacent land use. The existing conditions indicate that about 71 percent of the land area in Sherwood with density supportive of transit use would be within one-quarter mile of a transit stop (Figure 7-1). Future transit coverage would remain the same as existing, and the same transit supportive land area in Sherwood would be served (Figure 7-2).

This does not specifically address the frequency of some of the transit services or the destinations (which would require coordination with TriMet for this strategy to be effectively implemented).

Strategy 4 - "Provide Access to Commercial Areas"

This strategy focuses on providing access to locations where people choose to do their shopping. Commercial areas in the greater Sherwood area might include the six-corners area in Sherwood, and shopping centers along Highway 99W, and retail stores in Tualatin.

Strategy 5 - "Provide Additional Park & Ride Lots"

This strategy provides park & ride lots at locations where concentrated transit demand exists or where it is desirable for TriMet to stop.

Strategy 6 - "Provide Access to Activity & Service Centers"

This strategy focuses on providing transit access to destinations such as community centers, hospitals, schools, churches, etc.

Table 7-1 summarizes the strategies in terms of meeting the transportation goals and policies of Sherwood.

Table 7-1: Transit Facility Strategies Comparisons

Strategy	Policies					
	1-4	1-6	5-1	5-2	5-7	5-8
1. Provide Express Routes to Regional Employment Centers	■	■	■	□	□	❍
2. Provide Bus Shelters/Improved User Amenities	□	■	●	❍	❍	●
3. Provide More Local Transit Service	■	■	□	■	●	□
4. Provide Access to Commercial Areas	■	■	●	■	□	●
5. Provide Additional Park & Ride Lots	□	●	□	❍	□	●
6. Provide Access to Activity & Service Centers	■	■	●	■	●	□

■ Fully meets criteria
□ Mostly meets criteria
● Partially meets criteria
❍ Does not meet criteria

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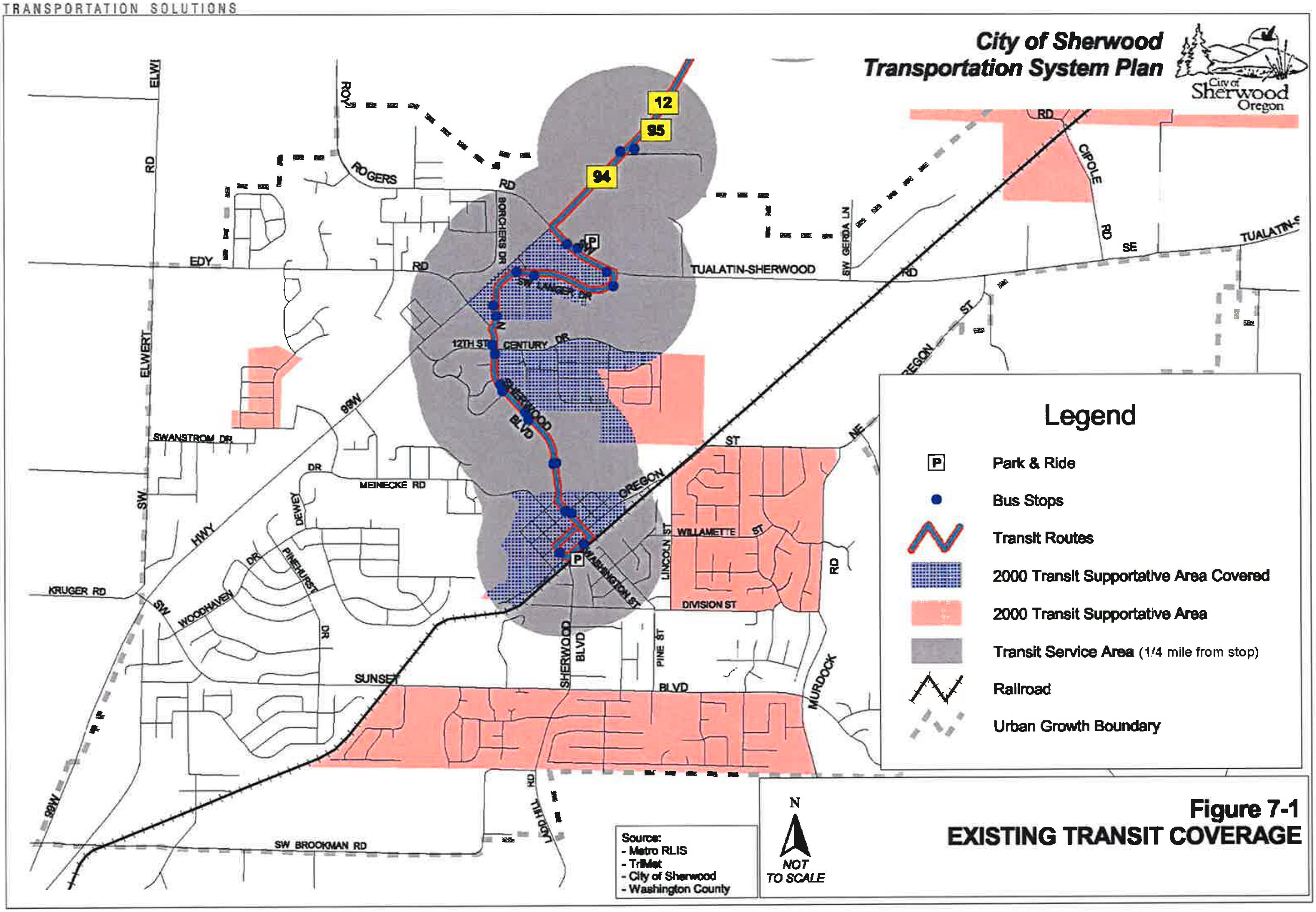


Figure 7-1
EXISTING TRANSIT COVERAGE

Transit Plan

Transit enhancements within the TriMet service area are ultimately decided based on regional transit goals. As such, Sherwood has little control over dictating the expansion of local service or decreasing headways. These decisions can be influenced however, if the proper densities are achieved along the transit routes, a decision over which the City has more control. Another tactic for increasing transit service to the City of Sherwood is through inter-governmental agreements and funding strategies between the City of Sherwood and TriMet in order to leverage transit dollars for local projects, providing better connections to transit facilities and supplying amenities at transit locations. Transit projects are summarized in Table 7-2. Transit projects were determined based on strategies listed above and project feasibility.

Table 7-2: Potential Transit Projects

Rank	Project	Agency Responsible	Description
1	Provide Transit Amenities at Major Transit Stops	Sherwood/TriMet	Provide shelters, information kiosks, etc along key transit routes in Sherwood with land use development. Expand park and ride lots where demand exceeds existing capacity.
2	Improve Pedestrian Connections to Transit Facilities	Sherwood/TriMet	Construct sidewalks, crosswalks, etc. adjacent to transit routes and facilities (i.e. park-and-ride lots, bus stops, etc.). Within one-quarter mile of bus stops, focus on enhancing pedestrian access. Give priority to improvements within the designated overlay district downtown.
3	Increase Density Adjacent to Transit	Sherwood	Direct growth to increase the density of houses within transit lines in the City of Sherwood in an effort to support regional transit service goals.
4	Decrease Headways	TriMet	Provide more frequent transit service during peak commute periods.
5	Provide More Local Service	TriMet	Provide services along Sunset Boulevard and in the southern part of the City, including the newely expanded UGB area as well as Murdock Road. Expand fixed-route services, as development requires. Time additional transit service to coordinate with major road extensions or street improvements.

TriMet has identified the potential to connect Sherwood to Tualatin with a new route along Tualatin-Sherwood Road[2]. If this route circled Sherwood by traveling along Oregon Street, Murdock Road, Sunset Boulevard, and Highway 99W, a major portion of the unserved areas would be covered. In this case, the new route would cross the existing TriMet routes on Tualatin-Sherwood Road between Langer Drive and Highway 99W. This could be a location to consider a Transit Center and an expanded park and ride facility.

[2] Transit Choices for Livability Handbook, TriMet, 2000.

In addition to the planned Tualatin-Sherwood TriMet route, the planned Commuter Rail project from Wilsonville to Beaverton has the potential to someday connect to Sherwood. If this connection were completed, the commuter rail stop in Sherwood would likely be located downtown next to the park and ride.

Currently, there are two park and ride facilities located in the City of Sherwood, providing the opportunity for residents to be connected via transit to the larger Portland region. One facility is located in downtown Sherwood at the intersection of Oregon Street and Sherwood Boulevard while another facility is located at 99W and Tualatin-Sherwood Road in the Regal Cinema parking lot. Due to a change in land use, the downtown park and ride will be discontinued in 2004 and turned into a combination of a bike only park and ride and parking for downtown businesses.

As the downtown park and ride will be converted into a bike and ride lot, a second park and ride lot must be constructed in order to better serve commuters patronizing TriMet in Sherwood. Two potential locations meet the Cities requirements:

- Adams Road between Tualatin-Sherwood Road and the Home Depot
- Brookman Road and the Rail Road tracks

The first alternative is advantageous due to the relatively inexpensive cost of land (under the existing power lines) and the connectivity to both 99W and Tualatin-Sherwood Road. However, there is currently a park and ride located in the Regal Cinemas parking lot, so both lots would effectively serve the same commuters. The second alternative would better serve the southern section of town, the newly expanded UGB area and potentially the proposed Interstate 5/99W Connector (if the preferred alignment is determined to be south of Sherwood). Additionally, this location could serve as a multi-modal facility and transfer point with the possible commuter rail extension.

Complementing Land Use Actions

There are three determining factors that play a role in the provision of a successful transit system: net housing density, transit level of service (frequencies) and proximity to station locations. The City of Sherwood has the ability to control the net housing densities located around current and potential transit stops and the proximity of development to these stops. While TriMet makes decisions regarding the third factor, transit level of service, the focus of development and land use decisions within proximity of transit locations will greatly effect the service decisions made by TriMet.

In order to provide a density high enough to support frequent service scheduled for Route 12 within ten (10) years, the housing density along the current transit corridor should be increased. Guiding development within the City of Sherwood to this corridor would help support the regional transit goal of providing an efficient and effective transit system, as well as reducing the reliance on the automobile for inter-jurisdictional work trips made by individuals living or working in this corridor.

In order to promote higher density developments, the City should consider requirements in the City of Sherwood Development Code that provides approval criteria related to public transit. The following provisions:

(a) Provisions within the plan shall be included for providing for transit if the development proposal is adjacent[3] to existing or proposed transit route;

(b) The requirements for transit facilities shall be based on:

[3] The code provision should define adjacent as having a bus stop within 500 feet of the property.

- The location of other transit facilities in the area; and
- The size and type of the proposal.

(c) The following facilities may be required after City and TriMet review:

- Bus stop shelters;
- Turnouts for buses; and
- Connecting paths to the shelters.

8. MOTOR VEHICLES

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

The motor vehicle element involves several elements. This chapter is separated into the following ten sections:

- Criteria
- Functional Classification (including summary of cross sections and local street connectivity)
- Circulation and Capacity Needs
- Safety
- Access Management
- Maintenance
- Neighborhood Traffic Management
- Parking
- Transportation System Management (TSM)/Intelligent Transportation Systems (ITS)
- Transportation Demand Management (TDM)
- Truck Routes

Criteria

An updated set of goals and policies to guide transportation system development in Sherwood has been developed as part of this TSP (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 Sherwood should be measured against to determine if they conform to the intended direction of the City.

Goal 1: Provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes serving all neighborhoods and businesses.

Policy 1 – The City will ensure that public roads and streets are planned to provide safe, convenient, efficient and economic movement of persons, goods and services between and within the major land use activities. Existing rights of way should be classified and improved and new streets built based on the type, origin, destination and volume of current and future traffic.

Policy 2 – Through traffic should be provided with routes that do not congest local streets and impact residential areas. Outside traffic destined for Sherwood business and industrial areas shall have convenient and efficient access to commercial and industrial areas without the need to use residential streets.

Policy 3 – Local traffic routes within Sherwood shall be planned to provide convenient circulation between home, school, work, recreation and shopping. Convenient access to major out-of-town routes shall be provided from all areas of the city.

Goal 2: Develop a transportation system that is consistent with the City's adopted comprehensive land use plan and with the adopted plans of state, local, and regional jurisdictions.

Policy 1 – The City shall implement the transportation plan based on the functional classification of streets shown in Figure 8-1.

Policy 2 – The City shall maintain a transportation plan map that shows the functional classification of all streets within the Sherwood urban growth area. Changes to the functional classification of streets must be approved through an amendment to the Sherwood Comprehensive Plan, Part 2, Chapter 6 - Transportation Element.

Policy 4 – The City will coordinate with Metro regarding implementation of the Regional Transportation Plan and related transportation sections of the Metro Functional Plan.

Policy 5 – The City shall adopt a street classification system that is compatible with Washington County Functional Classification System for areas inside the Washington County Urban Area Plan and with Washington County 2020 Transportation Plan (Ordinance 588).

Policy 6 – The City will work with Metro and other regional transportation partners to implement regional transportation demand management programs where appropriate.

Goal 3: Establish a clear and objective set of transportation design and development regulations that address all elements of the city transportation system and that promote access to and utilization of a multi-modal transportation system.

Policy 2 – The City of Sherwood shall require dedication of land for future streets when development is approved. The property developer shall be required to make street improvements for their portion of the street commensurate with the proportional benefit that the improvement provides the development.

Policy 5 – The City will adopt roadway design guidelines and standards that ensure sufficient right-of-way is provided for necessary roadway, bikeway, and pedestrian improvements.

Policy 7 – The City of Sherwood will generally favor granting property access from the street with the lowest functional classification, including alleys. Additional access to arterials and collectors for single family units shall be prohibited and use access from frontage roads and local streets. Frontage roads shall be designed as local streets.

Policy 9 – The City will establish guidelines and standards for the use of medians and islands for regulating access and providing pedestrian refuge on arterial and collector streets.

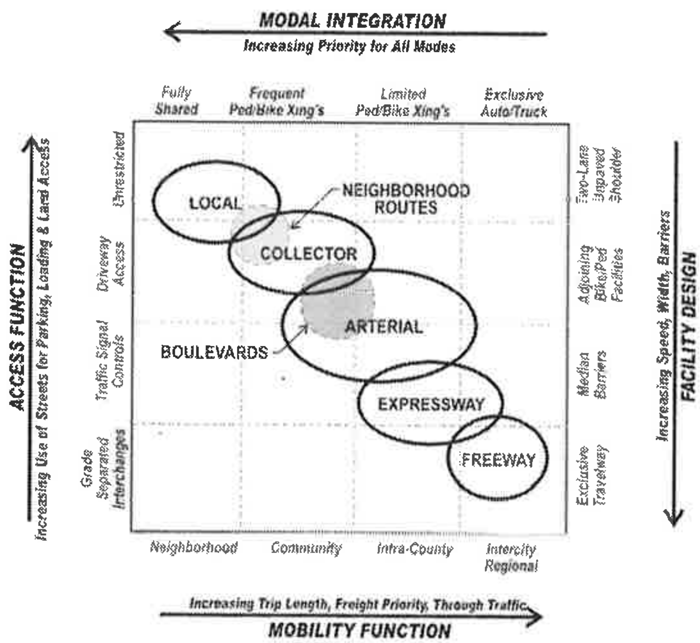
Policy 10 – The City will develop uniform traffic control device standards (signs, signals, and pavement markings) and uniformly apply them throughout the city.

Policy 12 – The City of Sherwood will adopt parking control regulations for streets as needed. On-street parking shall not be permitted on any street designated as an arterial, unless allowed by special provision within the Town Center (Old Town) area or through the road modifications process outlined in the Sherwood Development Code.

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. Arterials emphasize a high level of mobility for through movement; local facilities emphasize the land access function; and collectors offer a balance of both functions

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 do not represent function. For example, the volume of traffic on a roadway is 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.



Connectivity and Functional Class

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. Conversely, those with the shortest connections are the lowest level facilities. For a community such as Sherwood, the linkage between connectivity and street functional definition helps to relate street design, access spacing, and other transportation elements to issues specific to community design and livability. Other agencies, such as Washington County, Metro and ODOT use terms that conform to federal conventions (see next section for details), and generally have a much higher requirement for mobility, whereas, most of the city streets (collector, local) emphasize access and neighborhood type values.

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 efficient movement of persons, goods and services depends on an interconnected 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 generally defined all other routes as **local streets**, providing the highest level of access to adjoining land uses. These routes do not provide through connection at any significant regional, citywide or district level.

However, based upon connectivity, there is 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 function between a collector and a local street 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. Other routes people use to get in and around 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 that 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.

In the past, traffic volume and the size of a roadway have been directly linked to functional classification. More recently, urban design and land use designations have also been tied to functional classification. All of these approaches to functional classification tend to be confusing and ever changing, complicating an essential Transportation System Planning exercise. The planning effort to identify connectivity of routes in Sherwood is essential to preserve and protect future mobility and access, by all modes of travel. Without defining the varying levels of connectivity now in the Transportation System Plan, the future impact of the adopted Comprehensive Plan land uses will result in a degraded ability to move goods and people (existing and future) in Sherwood. The outcome would be intolerable delays and much greater costs to address solutions later rather than sooner.

By planning an effective functional classification of Sherwood streets, 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 35 to 65 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. These land use designations are very important not only to the City for planning purposes, but to the people that own land in Sherwood. The adopted land uses in Sherwood have been used in this study, working with the Metro regional forecasts for growth in the region for the next 20 years. As discussed in Chapter 10, if the outcome of this Transportation System Plan is either too many streets or solutions that are viewed to be too expensive, it is possible to reconsider the core assumptions regarding Sherwood's livability - its adopted land uses or its service standards related to congestion. The charge of this Transportation System Plan 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.

Functional Classification Definitions

The functional classification of streets in Sherwood is shown in Figure 8-1. Any street not designated as an arterial, collector or neighborhood route is considered a local street.

Principal Arterials are typically freeways and state highways that are access controlled and 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 State Highway Classification System).[1] In Sherwood, ORE 99W is the only route designated as a Statewide Highway. Tualatin-Sherwood Road is not designated in the State Highway Classification System.

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 for through traffic in lieu of a well placed arterial street. Access control is the key feature of an arterial route. Arterials are typically multiple miles in length. Many of these routes connect to cities surrounding Sherwood.

Collector streets provide both access and circulation within and between 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 (compared to arterials) and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system. Collectors are typically greater than 0.5 to 1.0 miles in length.

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[1] *1999 Oregon Highway Plan*, An Element of the Oregon Transportation Plan, Adopted by the Oregon Transportation Commission, March 18, 1999.

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.

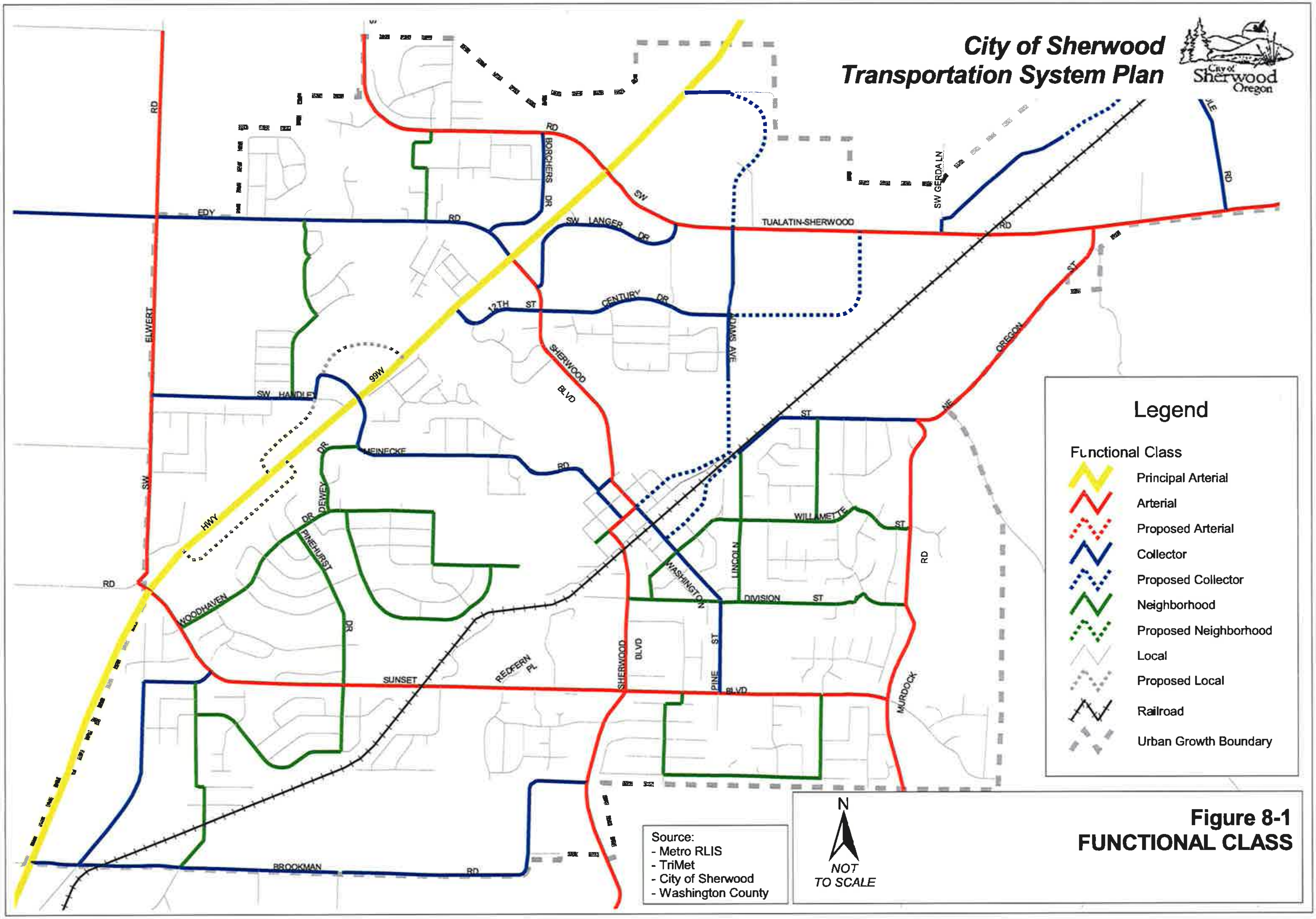

Figure 8-1
FUNCTIONAL CLASS

Other Jurisdictions and Functional Class Definitions

The City of Sherwood will need to coordinate with regional agencies to assure consistency in cross section planning as ODOT's Highway Plan and Metro's RTP move forward in its periodic update. The designations for major regional facilities within the study area are summarized in Table 8-1.

In addition, Sherwood will need to define routes separately according to street functional class conventions established by the Federal Highway Administration (FHWA). These designations are required for federal plan monitoring and funding applications. These designations can be different from Sherwood's local functional classification system. Two tables, one listing Sherwood's FHWA functional classification changes and another comparing the Washington County, Metro and FHWA's functional classifications, can be found in the Appendix.

Table 8-1: ODOT and Metro Regional Motor Vehicle Designations

Roadway	ODOT	Metro
ORE 99W	Statewide Highway - NHS Freight Route	Principal Arterial (Highway)
Tualatin-Sherwood Road	Not Classified	Minor Arterial
Roy Rogers Road	Not Classified	Minor Arterial
Oregon Street , (east of Murdock)	Not Classified	Minor Arterial
Murdock Road	Not Classified	Minor Arterial
Sunset Boulevard	Not Classified	Minor Arterial
Sherwood Boulevard	Not Classified	Collector of Regional Significance
Oregon Street (west of Murdock)	Not Classified	Collector of Regional Significance

Sources: ODOT, Oregon Highway Plan, 1999, and Metro, 2000 Regional Transportation Plan, Regional Motor Vehicle System. Refer to RTP for complete description of lower class roadways.

Functional Classification Changes in Sherwood

The functional classification (shown in Figure 8-1) differs from the existing approved functional classification. Neighborhood routes were not defined in the existing functional classification. The functional classification was developed following detailed review of Sherwood and Washington County's functional classification. Table 8-2 summarizes the major differences between the functional classification and the existing designations for streets in Sherwood. Generally, all Major Arterials are now Principal Arterials, all Minor Arterials are now Arterials, all Major Collectors are now Collectors and all Minor Collectors are now Neighborhood Routes, unless called out differently in the table below.

Elwert Road, Meinecke Road, Sunset Boulevard and Oregon Street were changed primarily because their classification seemed to better match the use of the roadway and also to be consistent with Washington County. Tualatin-Sherwood Road is classified by Washington County differently from ORE 99W (Arterial versus Principal Arterial). The appropriate status of this roadway should be determined as part of this TSP process. A number of streets (Sherwood Boulevard, Pine Street, Main Street, 1st Street, Washington Street) were changed due to planned realignments and to meet the intent of the Downtown Streets Plan. Lastly, a number of neighborhood routes were added in areas of the City where they were not previously defined.

Criteria for Determining Changes to Functional Classification

The criteria used to assess connectivity have two components: the extent of connectivity (as defined previously) 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 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. It is acceptable for the city to re-classify street functional designations to have different naming conventions than the RTP street functional classifications, however, the general intent and purpose of the facility, whatever the name, should be consistent with state and federal guidelines. A table comparing the functional classification with FHWA, Washington County and Metro is provided in the appendix.

Table 8-2: Changes to Existing Roadway Functional Classification

Street	Existing Class	Adopted Class	Comment
Oregon Street (Murdock Road to Pine Street)	Minor Arterial	Collector	Street realigned, causing function to change.
Sherwood Boulevard (3rd Street to 1st Street)	Minor Collector	Arterial	Planned as primary route connecting old town with 99W.
Pine Street	Minor Collector	Collector	Upgrading to provide direct connection between Sunset Boulevard and 99W.
Meinecke Road (ORE 99W to Lee Drive)	Minor Arterial	Collector	Provide cohesive classification of street.
Meinecke Road (Lee Drive to downtown)	Minor Collector	Collector	Provide cohesive classification of street.
New connection between Woodhaven Drive and Meinecke Road	New Street	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
Sunset Boulevard (ORE 99W to Pinehurst Drive)	Major Arterial	Arterial	Provide cohesive classification of street.

Street	Existing Class	Adopted Class	Comment
Brookman Road	Not Classified	Collector	Upgrading to serve the recent UGB expansion.
Elwert Road	Major Collector	Arterial	Upgrading to serve the recent UGB expansion.
Adams Street	Not Classified	Collector	New extension.
Washington Street (1st to Division)	Minor Collector	Local	Downgrading and moving functional class to Pine Street.
Galbreath Drive	Not Classified	Collector	Collector to provide connection between Sherwood Industrial area and Cipole Road
Century Drive	New Street	Collector	Collector to provide connection between new Adams connection and principal arterial.
Washington Street (3rd Street to 1st Street)	Minor Collector	Collector	Upgrade to serve as alternative to Sherwood Boulevard in downtown.
1st Street	Minor Collector	Arterial	Upgrading to serve as primary old town through route.
Main Street (1st Street to 3rd Street)	Minor Collector	Local	Downgrading for alternative routes in downtown.
Main Street (Railroad Street to 1st Street)	Minor Collector	Arterial	Upgrading to serve as primary old town through route.
Railroad Avenue	Minor Collector	Local	Downgrading for alternative routes in downtown.
Handley Street	Not Classified	Collector	Upgrading to serve the recent UGB expansion.
Lincoln Street	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
Dewey Drive	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
Saunders Drive (Woodhaven Drive to Villa Road)/Villa Road (Saunders Drive to 1st Street)	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
Stellar Drive (Woodhaven to Villa Road)	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
1st Street (Villa Road to Main Street/ South Sherwood Boulevard)	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
Handley Street/Cedar Brook Way/Meinecke Parkway	Not Classified	Collector	Provide connections from local neighborhoods to collectors or arterials.
Middleton Road (Brookman Road to Timbrel lane)	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.

Street	Existing Class	Adopted Class	Comment
Inkster Drive	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
Roellich Avenue/Ladyfern Drive/Bedstraw Terrace	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
Old Pacific Highway	Not Classified	Collector	Upgrading to serve the recent UGB expansion.
Timbrel Lane	Not Classified	Collector	Upgrading to serve the recent UGB expansion.
Pinehurst Drive	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
Cinnamon Hills Place (Sunset Boulevard to Hawk Court)/Hawk Court/Cascara Terrace/Highpoint Drive (Cascara Terrace to Brittany Lane)/Brittany Lane	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
Houston Dr (Edy Road to Lynnly Way)/Lynnly Way (Houston Drive to Roy Rogers Road)	Not Classified	Neighborhood Route	Provide connections from local neighborhoods to collectors or arterials.
ORE 99W Frontage Roads	New Streets	Local Commercial/ Industrial	These roads do not serve cross-town traffic as a collector would, but should be built to the wider commercial/industrial standard to accommodate commercial/industrial traffic volumes and parking needs.

Characteristics of Streets for each Functional Classification

The design characteristics of streets in Sherwood 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. Figure 8-2 to Figure 8-6 depict sample street cross-sections and design criteria for arterials, collectors, neighborhood routes and local streets. Figure 8-2 shows the standard cross-sections for Arterials, Figure 8-3a the cross-section of Alleys, Figure 8-3b shows the ODOT standard cross-section for ORE 99W, Figure 8-4 shows the cross-sections for Collectors, Figure 8-5a shows the Local Street standard cross-sections, and Figure 8-5b shows the pedestrian street cross-section that is to be used in the Downtown area. Figure 8-6 shows the trail cross-sections.

Planning level right-of-way needs can be determined utilizing these figures, 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).

The analysis of capacity and circulation needs for Sherwood outlines several roadway cross sections. The most common are 2, 3 and 5 lanes wide. Where center left turn lanes are identified (3 or 5 lane sections), the actual design of the street may include sections without center turn lanes (2 or 4 lane sections[2]) 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.

Table 8-3: Street Characteristics

Street Element	Characteristic	Width/Options
Vehicle Lane Widths:	Truck Route =	12 feet
(Minimum widths[3])	Bus Route =	11 feet
	Arterial =	12 feet
	Collector =	11 feet
	Neighborhood =	10 feet
	Local =	9[4] to 10 feet
	Turn Lane =	12 feet[5]
On-Street Parking:		8 feet[6]
Bicycle Lanes:	New Construction =	6 feet
(minimum widths)	Reconstruction =	5 to 6 feet
Curb Extensions for Pedestrians:	Required on all collectors and arterials where parking is allowed.	
Sidewalks:	Local =	6 feet[7]
(Minimum width)	Neighborhood =	8 feet[7]
	Collector =	6 to 8[8] feet
	Arterial =	6 to 12[8] feet
Landscape Strips:	Required on all streets	
Medians:	5-Lane =	Required
	3-Lane =	Required
	2-Lane =	Optional
Neighborhood Traffic Management:	Local =	Should not be necessary
	Neighborhood =	Should Consider
	Collectors =	Under Special Conditions
	Arterials =	Prohibited

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[2] For example, adjacent to environmentally sensitive or physically constrained areas.

[3] A special pedestrian street cross-section has been developed specifically for downtown streets (both arterials and collectors). This cross-section allows 11 foot travel lanes and 7 foot parking lanes.

[4] 9 foot lanes would only be used in conjunction with on-street parking.

[5] In constrained conditions on collectors, neighborhood and local routes, a minimum width of 10 feet may be considered (i.e. at intersections, except on bus routes)

[6] For 32 foot streets, the City recognizes that there will not be 20 feet of unobstructed pavement. On arterials, on-street parking should be limited to special circumstances, such as in the downtown area.

[7] Sidewalks should be 6 feet on local streets, 8 feet on neighborhood routes and 6 feet in commercial/industrial areas, except in the downtown area where they will be 12 feet, as designated in the pedestrian street cross-section, developed specifically for downtown.

[8] Larger sidewalks than minimums should be considered for areas with significant pedestrian volumes. In commercial areas where pedestrian flows of over 100 pedestrians an hour are present or forecast, specific analysis should be conducted to size sidewalks appropriately for safe movement.

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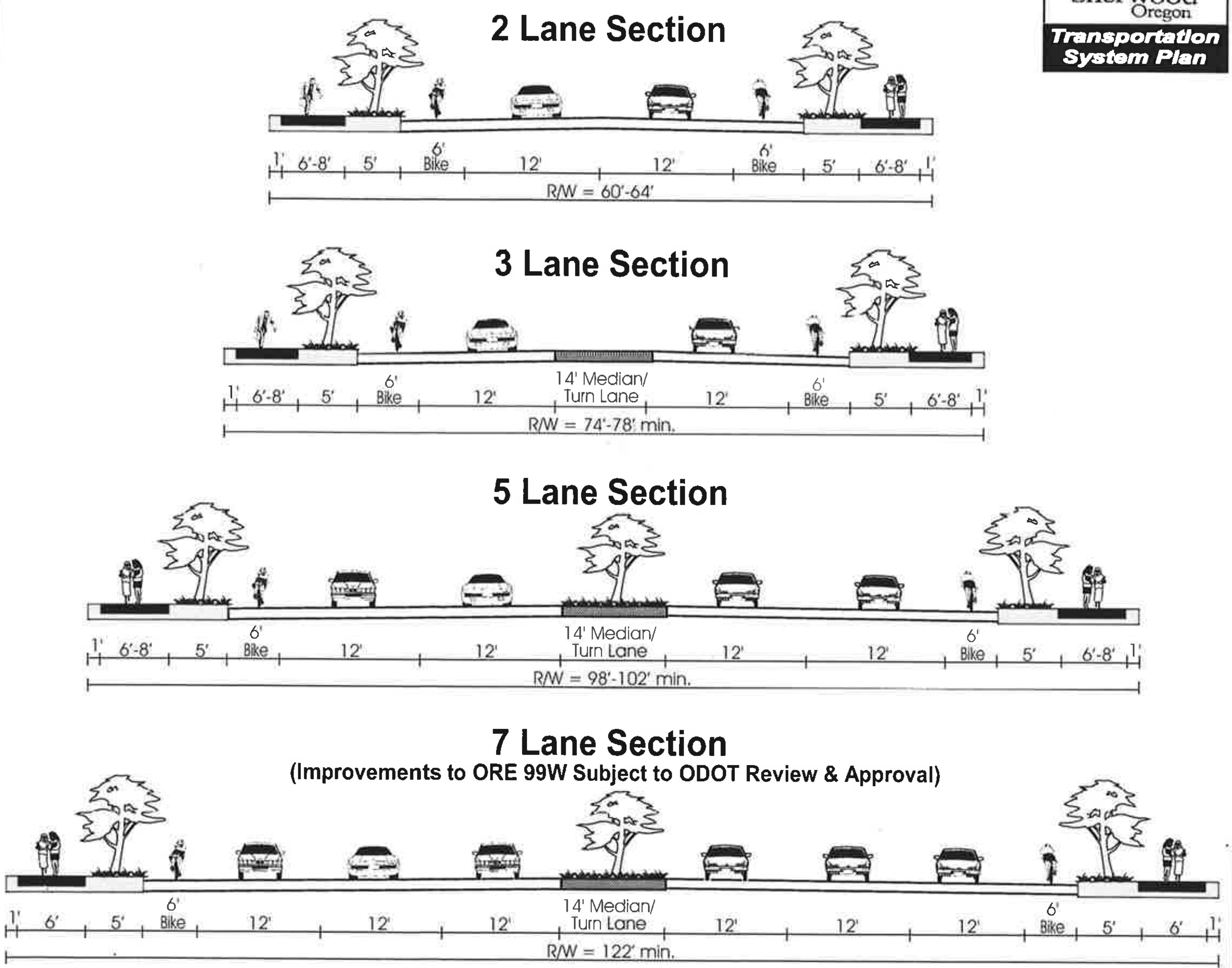
City of Sherwood Oregon
Transportation System Plan



A variance requires demonstration of hardship or other exceptional circumstances resulting from conditions of the property. Variances must meet Sherwood Development Code and TPR criteria.

Arterial Street Design Characteristics

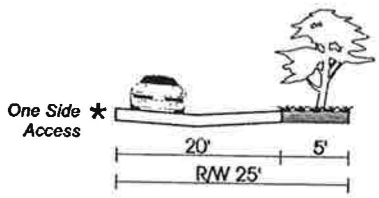
Characteristic	Arterials
Vehicle Lane Widths (Turn Lane - 12-14 ft.)	12 ft.
On-Street Parking	Only in (i.e. downtown) (8 ft.)
Bicycle Lanes (minimums)	6 ft.
Sidewalks (minimums)	6-8 ft. *1
Landscape Strips	Required
Raised Medians	Required
Neighborhood Traffic Management (NTM)	Prohibited
Transit	Appropriate
Turn Lanes	When Warranted *2
Access Control	See Later Discussion

Notes:

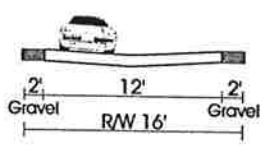
1. *8 feet for residential streets, 6 feet in commercial/industrial areas.*
2. *Turn lane warrants should be reviewed using Highway Research Record No. 211, NCHRP Report No. 279 or other updated/superseding reference.*

Figure 8-2
ARTERIAL STREETS
SHERWOOD
STREET CROSS SECTIONS

Alley
(No Parking)



Alley
(No Parking)



A variance requires demonstration of hardship or other exceptional circumstances resulting from conditions of the property. Variances must meet Sherwood Development Code and TPR criteria.

Figure 8-3A
ALLEY STANDARD
STREET CROSS SECTIONS

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Transportation System Plan

7 Lane Section

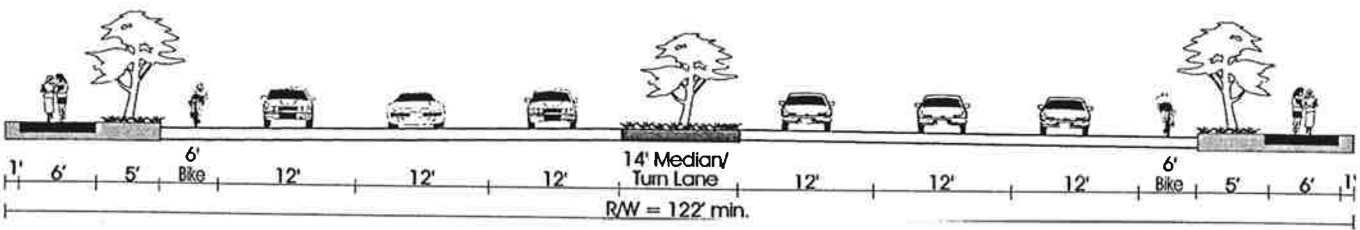

Figure 8-3B
ORE99W ODOT STANDARD STREET CROSS SECTION

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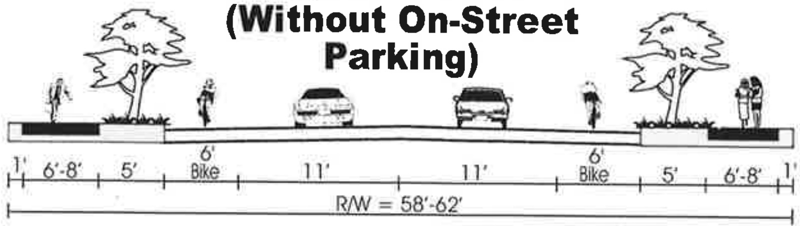
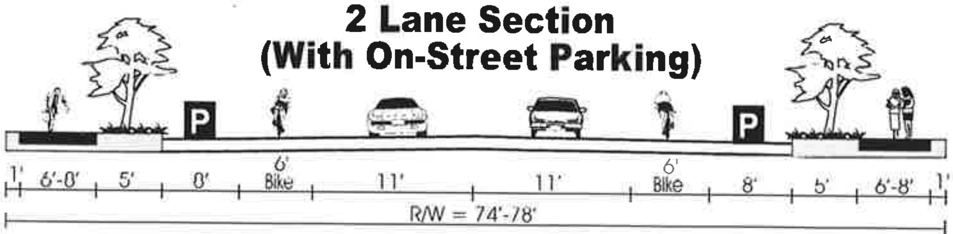
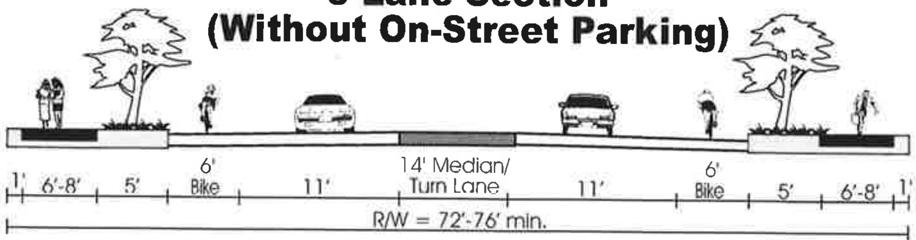
2 Lane Section (Without On-Street Parking)



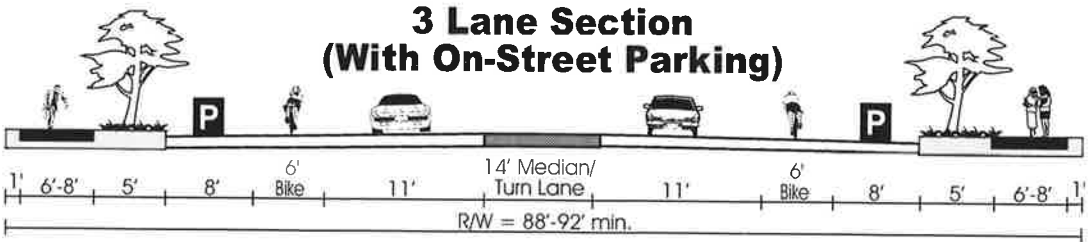
2 Lane Section (With On-Street Parking)



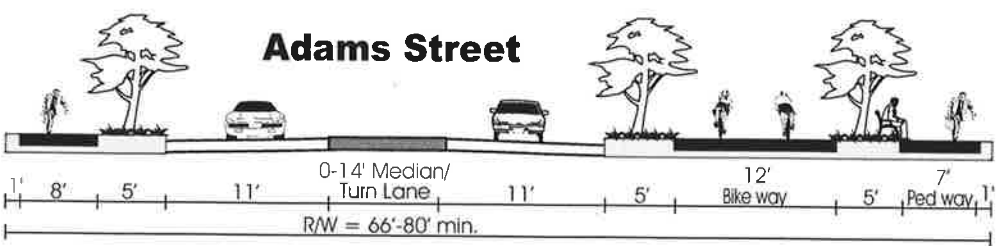
3 Lane Section (Without On-Street Parking)



3 Lane Section (With On-Street Parking)



Adams Street



A variance requires demonstration of hardship or other exceptional circumstances resulting from conditions of the property. Variances must meet Sherwood Development Code and TPR criteria.

P - *On-street Parking Lane (except at intersections)*

Notes:

1. *In constrained conditions on collectors a minimum width of 10 feet may be considered (i.e. for intersection turn lanes). 14-feet is desirable for continuous two-way left turn lanes.*
2. *8 feet for residential streets, 6 feet in commercial/industrial areas.*
3. *Turn lane warrants should be reviewed using Highway Research Record No. 211, NCHRP Report No. 279 or other updated/superseding reference.*

Collector Street Design Characteristics

Characteristic	Collectors
Vehicle Lane Widths (Turn Lane - 12-14 ft.) *1	11 ft.
On-Street Parking	8 ft.-Optional
Bicycle Lanes (minimums)	6 ft.
Sidewalks (minimums)	6-8 ft. *2
Landscape Strips	Required
Raised Medians	Optional (Required where 3-lane section used)
Neighborhood Traffic Management (NTM)	Under Special Conditions
Transit	Appropriate
Turn Lanes	When Warranted *3
Access Control	See Later Discussion

Figure 8-4
COLLECTOR STREETS
SHERWOOD
STREET CROSS SECTIONS

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A variance requires demonstration of hardship or other exceptional circumstances resulting from conditions of the property. Variances must meet Sherwood Development Code and TPR criteria.

City of Sherwood Oregon
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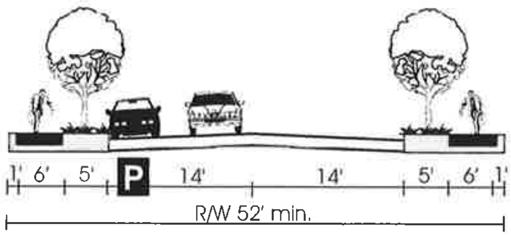
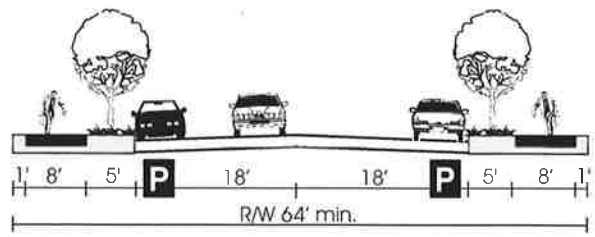
28' Standard Residential*



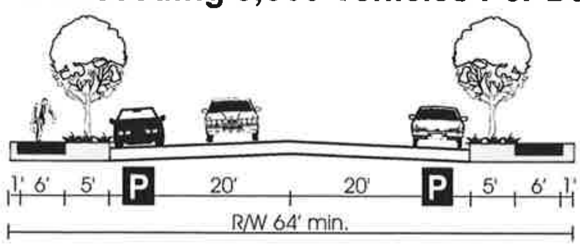
<1,000 vpd

36' Neighborhood Route

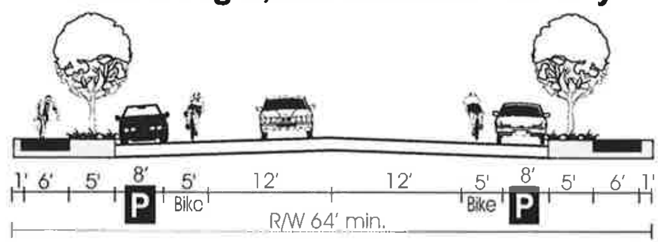


>1,000 vpd

40' Standard Commercial/Industrial Not Exceeding 3,000 Vehicles Per Day



50' Standard Commercial/Industrial Exceeding 3,000 Vehicles Per Day



Local Street Design Characteristics
(typically minimums unless stated otherwise)

Characteristic	Neighborhoods	Locals	Comm/Ind
Vehicle Lane Widths (Bus Route - 11 ft.)	*10 ft.*	*10 ft.*	*20 ft.**
On-Street Parking	*8 ft.*		
Sidewalks (minimums)	*8 ft.*	*6 ft.*	*6 ft.*
Landscape Strips	*Required*	*Required*	*Required*
Neighborhood Traffic Management (NTM)	*Acceptable*	*Should Not be Necessary*	*Acceptable*
Transit	*Special Circumstances*	*Not Appropriate*	*Acceptable*

* *Combined travel/parking lane.*

Legend

P - *On-street Parking Lane*

***** - *Parking can be provided on both sides if it can be demonstrated that curb cuts make up at least 40% of street frontage.*

Figure 8-5a
LOCAL/NEIGHBORHOOD STREETS
SHERWOOD
STREET CROSS SECTIONS

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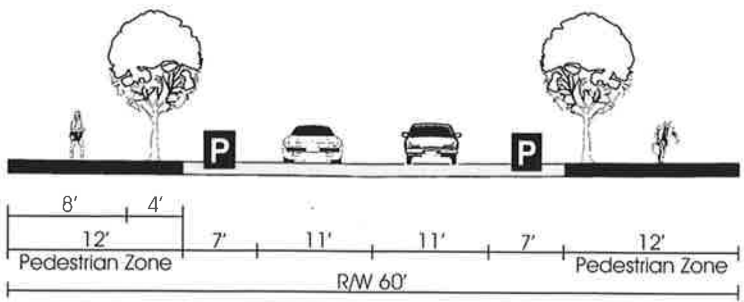
Transportation System Plan

Pedestrian Streets**



** *No Curbs*

Legend

P - *On-street Parking Lane (except at intersections)*

Figure 8-5b
DOWNTOWN STREET STANDARDS
RESIDENTIAL/PEDESTRIAN

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A variance requires demonstration of hardship or other exceptional circumstances resulting from conditions of the property. Variances must meet Sherwood Development Code and TPR criteria.

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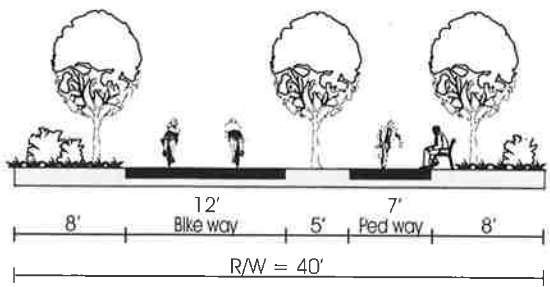
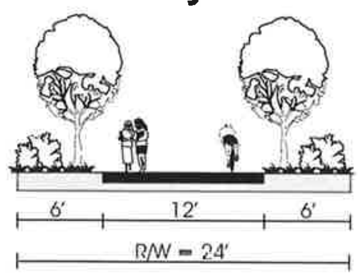
Pedestrian/Bicycle Greenway



Primary Trail



Feeder Trail

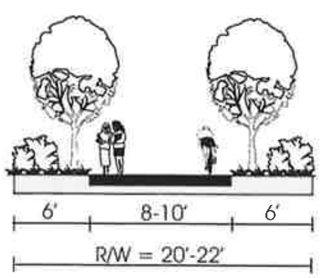


Figure 8-6
TRAIL STANDARDS
SHERWOOD
CROSS SECTIONS

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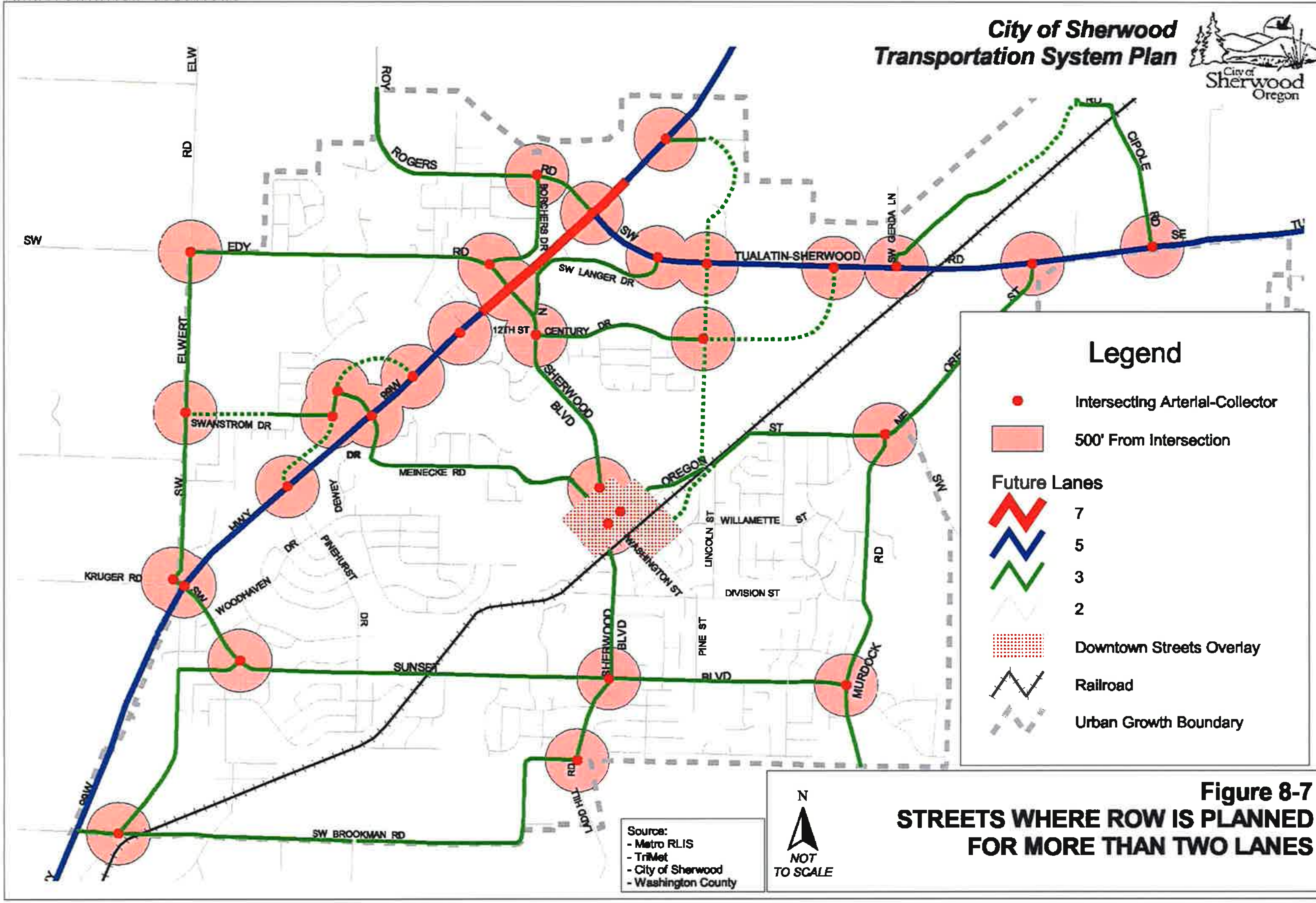

Figure 8-7
STREETS WHERE ROW IS PLANNED FOR MORE THAN TWO LANES

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Transportation System Plan

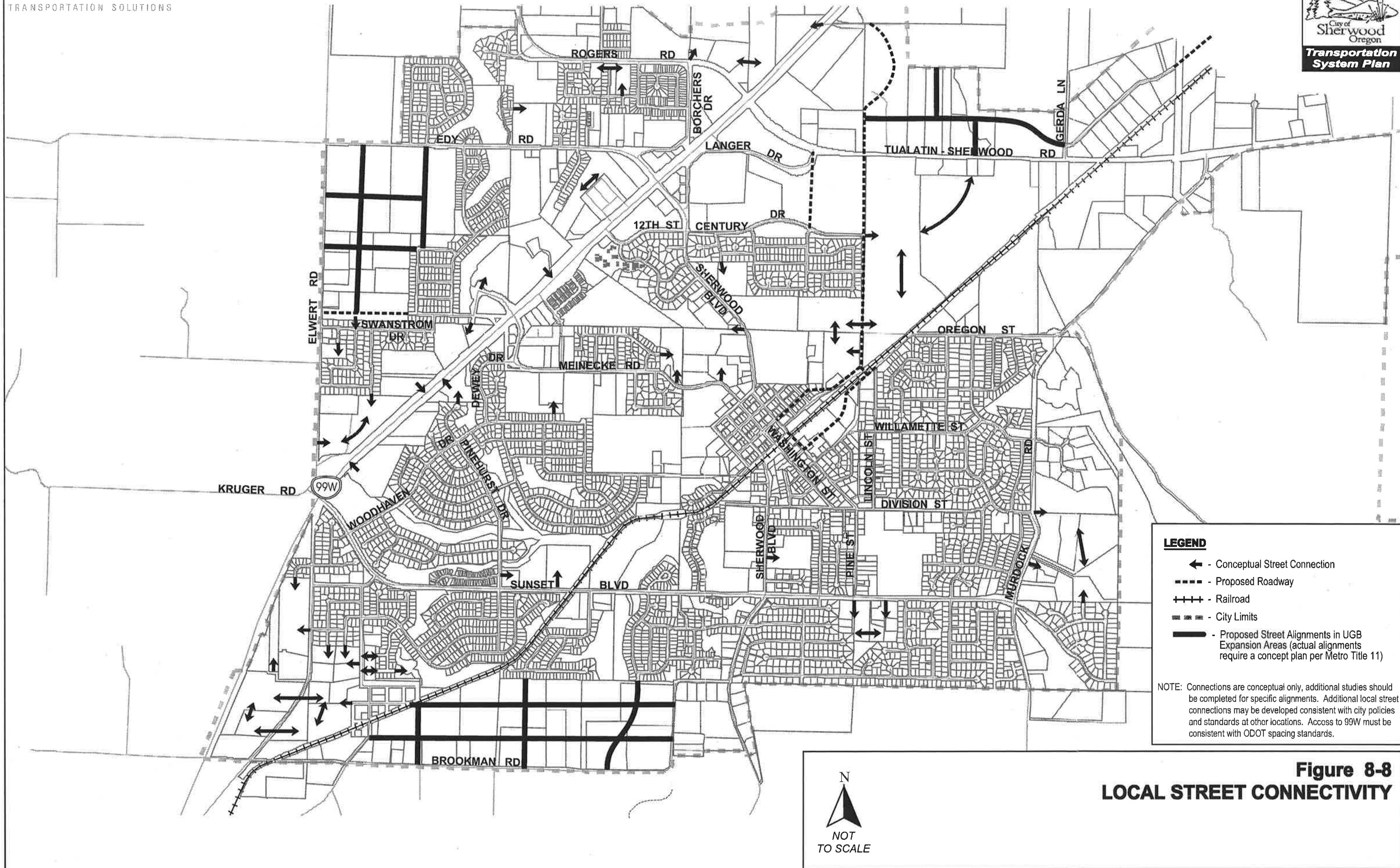

Figure 8-8
LOCAL STREET CONNECTIVITY

Connectivity/Local Street Plan

Much of the local street network in Sherwood is built and, in many cases, fairly well connected. In other words, multiple access opportunities exist for entering or exiting neighborhoods. However, there are a number of locations where, 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. The outcome can result in the need for wider roads, traffic signals and turn lanes (all of which negatively impact traffic flow and degrade safety). 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. Additionally, public safety response time is reduced. Several goals and policies established by this Transportation System Plan are intended to accomplish these objectives.

In Sherwood, 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 where a significant amount of new development is possible. Figure 8-8 shows the Local Street Connectivity Plan for Sherwood. In most 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. The criteria used for providing connections is as follows:

- Every 300 feet, a grid for pedestrians and bicycles
- Every 500 feet, a 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. All stub streets should have signs indicating the potential for future connectivity. Additionally, new development that constructs new streets, or street extensions, must provide a proposed street map that:

- Provides full street connections with spacing of no more than 530 feet between connections except where prevented by barriers
- Provides bike and pedestrian access ways in lieu of streets with spacing of no more than 330 feet except where prevented by barriers
- Limits use of cul-de-sacs and other closed-end street systems to situations where barriers prevent full street connections
- Includes no close-end street longer than 220 feet or having no more than 25 dwelling units
- Includes street cross-sections demonstrating dimensions of ROW improvements, with streets designed for posted or expected speed limits

The arrows shown on the local connectivity figures indicate priority connections only. Topography, railroads and environmental conditions limit the level of connectivity in Sherwood. Other stub end streets in the City's road network may become cul-de-sacs, extended cul-de-sacs or provide local connections. Pedestrian connections from the end of any stub end street that results in a cul-de-sac should be considered mandatory as future development occurs. The goal would continue to be improved city connectivity for all modes of transportation.

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City of Sherwood Oregon

Transportation System Plan

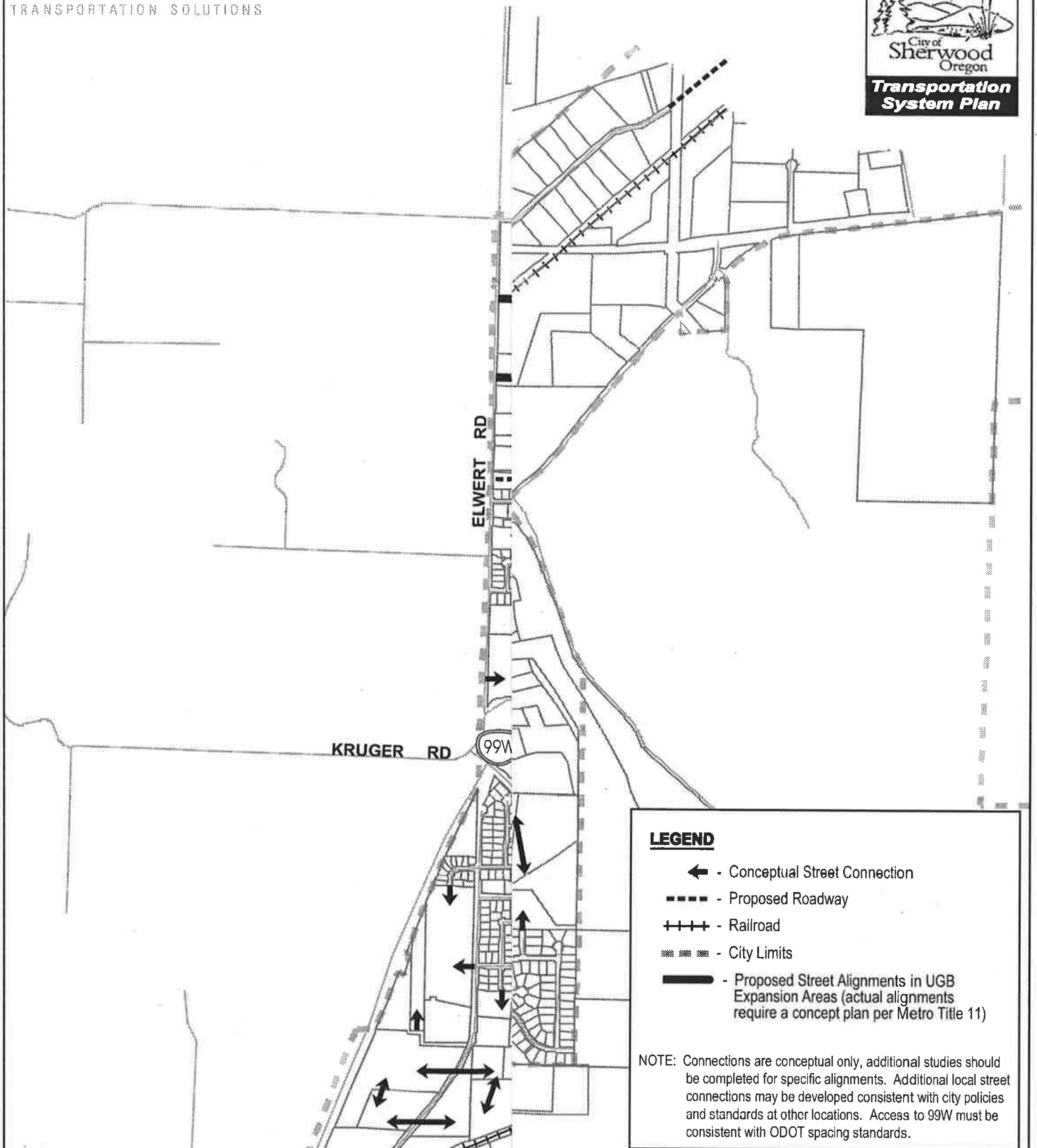

Figure 8-8
LOCAL STREET CONNECTIVITY

Circulation and Capacity Needs

The motor vehicle capacity and circulation needs in Sherwood 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 Sherwood are significant. Many of the improvements discussed in this section were previously identified in the Washington County TSP and the RTP. The 2020 capacity analysis done through the city's Transportation System Plan confirmed the need for investments, plus it identifies additional projects for traffic signal and intersection improvements that compliment other roadway projects. The study also highlights long-range issues on state facilities that will require further analysis and design decisions to adequately support regional mobility and performance standards.

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 not all the improvements can be done at once. This will require prioritization of projects and periodic updating to reflect current needs. It should be understood that the improvements outlined in the following section are a guide to managing growth in Sherwood, defining the types of right-of-way and street needs that will be required as development occurs.

Strategies

A series of strategies were developed to address the future motor vehicle needs of Sherwood. The following listing reflects the initial prioritization of strategies.

- Promote Regional Circulation (ORE 99W, Tualatin-Sherwood Road)
- Improve Local Street Circulation (connectivity)
- Provide Additional Street System Capacity to LOS D[11] (turn lanes, signals, widening, new roads)
- Improve Operation of Existing System (signal coordination, intelligent transportation systems, neighborhood traffic management)
- Transportation Demand Management (telecommuting, alternative modes, pricing)
- Change Land Use to Promote Alternative Modes Use
- Improve Access Control to increase capacity
- Change Level of Service Definitions

Future Intersection Capacity Analysis

Year 2020 traffic volume forecasts were analyzed to identify locations where peak hour performance will drop below minimum desirable levels (worse than LOS D). This focuses on the 35 study intersections that were previously examined under Existing Conditions (2003 traffic volumes), but also includes a review of road segment approaches to major intersections. The following tables summarize intersection levels of service in Sherwood for 2020 operating conditions for both Build and No-Build scenarios. The planned street improvements listed in Chapter 4 (see Table 4-4) are expected to be constructed and operational by 2020.

[11] Level of service D as defined by the Highway Capacity Manual, latest version.

The No-Build scenario includes the following improvement, which was constructed after the base year model (2000) was developed in 2000:

Oregon Street: Widen from two-lanes to three-lanes between Tualatin-Sherwood Road and Murdock Road. Traffic Signal at Oregon Street/Tualatin-Sherwood Road.

The Build scenario includes the "No-Build" improvement, plus the following improvements:

Tualatin-Sherwood Road: Widening from three-lanes to five-lanes between Teton Road and ORE 99W. Intertie signals from Borchers to Adams and between Oregon and Cipole.

Downtown Street Plan (i.e. Oregon Street Realignment, Pine Street Extension, Railroad Avenue disconnected)

Adams Street between Pine Street and Tualatin-Sherwood Road

Intersection-specific mitigation measures (these are described later in this chapter)

Traffic volumes were developed as described previously and applied to existing intersection geometries, except where additional through lane capacity was programmed in the future. The value in this analysis as a starting point in reviewing the motor vehicle system performance is that it highlights where the planned system fails to meet performance standards. These locations will be reviewed to consider street improvements alternatives that could better serve planned growth.

Findings

For the No-Build scenario, many of the intersections controlled by traffic signals will continue to operate at LOS C or better with growth planned to 2020. However, a number of intersections will degrade to LOS E. For the Build scenario, many study intersections improve slightly and none will degrade below LOS D or volume-to-capacity worse than 0.90.

Many of the unsignalized intersections operate at LOS D or worse for both the No-Build and Build scenarios. This means that the minor street approaches to these intersections experience moderate to long delays. The major street movements generally are not impeded and typically only a handful of minor street vehicles experience delay. Signal warrants were evaluated to determine where traffic signals might be needed at locations that do not have a traffic signal today (see discussion below). Several of the study intersections in Sherwood met MUTCD's Eight-Hour Volume Warrant (Warrant 1) under 2020 traffic volume conditions. Table 8-4 shows the future 2020 No-Build intersection levels of service within Sherwood and Table 8-5 shows the future 2020 Build intersection levels of service.

A 2020 Build (Mitigated) scenario was evaluated. This scenario includes improvements that are needed beyond the improvements that were assumed for the 2020 modeling work (described previously). The additional mitigation that would be required to achieve the levels of service for 2020 Build (Mitigated) are as follows:

- Tualatin-Sherwood Road/Langer Drive: Remove traffic signal due to close proximity to signal at Tualatin-Sherwood Road/Regals Cinemas and future signal at Tualatin-Sherwood Road/Adams Street.
- Sherwood Boulevard/Langer Drive: Remove traffic signal due to close proximity to signal at ORE 99W/Sherwood Boulevard and future signal at Sherwood Boulevard/Century Drive. Limit movements to left-in and right-in/right-out only (i.e. restrict left turn movement from Langer Drive onto Sherwood Boulevard south-eastbound.

- Edy Road/Borchers Drive: Some type of traffic control enhancement would be required at this intersection. A traffic signal or roundabout are possibilities. Level of service reported in table assumes traffic signal is in place.
- Sherwood Boulevard/Century Drive: Install traffic control device (could be traffic signal or roundabout).
- Oregon Street/Tonquin Road: Some sort of traffic control enhancement will be required at this intersection. A traffic signal is not a likely candidate due to the close proximity to the roundabout at Oregon Street/Murdock Road. A roundabout may be a candidate, however, there are topography and other issues that must be considered. No traffic control enhancements were assumed for the analysis reported in the table.
- Tualatin-Sherwood Road/Gerda Lane: This intersection operates poorly, but Gerda Lane is planned to be extended east to meet Cipole Road. This will provide an additional outlet to the businesses located along Gerda Lane, including access to a traffic signal at Tualatin-Sherwood Road/Cipole Road. The analysis reported in this table does not assume the Gerda Lane extension, but the minor street movement would likely still operate at LOS F, even with the extension in place. This poor level of service would be acceptable given alternative signalized access would be available and given access management policies on Tualatin-Sherwood Road.

The Oregon Highway Plan sets maximum volume-to-capacity ratios (v/c) for peak hour operating conditions, based on ODOT's highway classification and other criteria for state facilities (indicated with an * in Table 8-4 and Table 8-5). For statewide freight routes within the Metro area (i.e. ORE 99W through Sherwood), intersections are required to operate at a v/c of 0.95 or better (2040 Concept Area) or 0.90 or better (Non-Concept Area)[12]. Additionally, alternate highway mobility standards have been defined for specifically designated areas within Metro's boundaries[13]. Specifically, Corridors (as 99W is designated) have a maximum v/c ratio of 0.99 for both the first and second hours. Under existing and future conditions, these criteria are met for all state facilities in the study area.

Table 8-4: 2020 No-Build PM Peak Hour Intersection Level of Service

Intersection	*Level of Service*	*Average Delay*	*Volume / Capacity*
Signalized Intersections			
ORE 99W/Home Depot*	C	25.9	0.90
ORE 99W/Tualatin-Sherwood Rd*	E	55.9	0.99
ORE 99W/Sherwood Blvd*	D	48.0	0.94
ORE 99W/Meinecke Rd*	B	18.5	0.76
ORE 99W/Sunset Blvd*	D	36.8	0.92
Tualatin-Sherwood Rd/Cipole Rd	C	25.7	0.89
Tualatin-Sherwood Rd/Oregon St	E	78.6	1.20
Tualatin-Sherwood Rd/Langer Dr	C	33.4	0.90

[12] 2040 Growth Concept, Metro, adopted December 14, 1995 and last amended November 14, 2002.

[13] Amendment to 1999 Oregon Highway Plan Alternate Highway Mobility Standards Metro Area, Table 7.

Intersection	*Level of Service*	*Average Delay*	*Volume / Capacity*
Tualatin-Sherwood Rd/Regal Cinemas	C	23.9	0.72
Roy Rogers Rd/Borchers Dr	A	8.5	0.60
Sherwood Blvd/Langer Dr	E	55.5	0.77
Roundabout Intersections			
Meinecke Rd/Dewey Dr	A	4.0	0.30
Oregon St/Murdock Rd	A	7.9	0.72
All-Way Stop Controlled Intersections			
Sherwood Blvd/Railroad Ave	B	11.2	0.52
Sunset Blvd/Murdock Rd	B	11.2	0.47
Sunset Blvd/Pinehurst Dr	C	15.8	0.73
Sunset Blvd/Sherwood Blvd	D	33.3	0.97
Washington St/3rd Ave	A	9.5	0.36
Washington St/Railroad Ave	B	12.4	0.61
Cipole Rd/Herman Rd	B	10.2	0.41
Edy Rd/Elwert Rd	B	13.0	0.65
Unsignalized Intersections			
ORE 99W/Brookman Rd*	C/F		
Tualatin-Sherwood Rd/Gerda Ln	B/F		
Brookman Rd/Ladd Hill Rd	A/B		
Edy Rd/Borchers Dr	A/C		
Elwert Rd/Kruger Rd	A/B		
Elwert Rd/Swanstrom Dr	A/B		
Murdock Rd/Willamette St	A/B		
Oregon St/Lincoln St	A/B		
Oregon St/Tonquin Rd	A/F		
Pine St/Oregon St	A/F		
Sherwood Blvd/3rd St	A/D		
Sherwood Blvd/Century Dr	A/F		
Sunset Blvd/Pine St	A/D		
Sunset Blvd/Woodhaven Dr	A/E		

Signalized and All-Way Stop Intersection LOS:
LOS = Level of Service, Delay = Average vehicle delay in the peak hour for entire intersection,
V/C = Volume to Capacity Ratio
Unsignalized Intersection LOS:
A/A=Major Street turn LOS/Minor street turn LOS
Roundabout Intersection LOS:
LOS = FHWA Methodology Level of Service, Delay = FHWA Methodology Level of Service,
V/C = HCM Methodology worst approach Volume to Capacity Ratio
* Indicates intersection where ODOT v/c thresholds apply

Table 8-5: 2020 Build and Build (Mitigated) PM Peak Hour Intersection Level of Service

Intersection	2020 Build			2020 Build (Mitigated)		
	Level of Service	*Average Delay*	*Volume / Capacity*	*Level of Service*	*Average Delay*	*Volume / Capacity*
Signalized Intersections						
ORE 99W/Home Depot*	B	17.9	0.76	B	17.9	0.76
ORE 99W/Tualatin-Sherwood Rd*	D	43.9	0.86	D	43.9	0.86
ORE 99W/Sherwood Blvd*	D	38.1	0.80	D	38.1	0.80
ORE 99W/Meinecke Rd*	B	16.4	0.72	B	16.4	0.72
ORE 99W/Sunset Blvd*	C	31.3	0.85	C	31.3	0.85
Tualatin-Sherwood Rd/Cipole Rd	B	15.7	0.56	B	15.7	0.56
Tualatin-Sherwood Rd/Oregon St	C	22.1	0.75	C	22.1	0.75
Tualatin-Sherwood Rd/Langer Dr	**B**	**16.3**	**0.47**	**B/B**		
Tualatin-Sherwood Rd/Regal Cinemas	B	19.3	0.52	B	19.3	0.52
Roy Rogers Rd/Borchers Dr	A	7.6	0.56	A	7.6	0.56
Sherwood Blvd/Langer Dr	**D**	**39.0**	**0.61**	**A/C**		
Roundabout Intersections						
Meinecke Rd/Dewey Dr	A	2.8	0.15	A	2.8	0.15
Oregon St/Murdock Rd	A	5.4	0.34	A	5.4	0.34
All-Way Stop Controlled						
Sherwood Blvd/Railroad Ave	B	10.7	0.45	B	10.7	0.45
Sunset Blvd/Murdock Rd	B	10.2	0.39	B	10.2	0.39
Sunset Blvd/Pinehurst Dr	B	13.5	0.64	B	13.5	0.64
Sunset Blvd/Sherwood Blvd	C	23.0	0.83	C	23.0	0.83
Washington St/3rd Ave	A	7.5	0.12	A	7.5	0.12
Washington St/Railroad Ave	A	7.8	0.19	A	7.8	0.19
Cipole Rd/Herman Rd	A	9.2	0.28	A	9.2	0.28
Edy Rd/Elwert Rd	B	11.4	0.57	B	11.4	0.57
Unsignalized Intersections						
ORE 99W/Brookman Rd*	C/F			C/F		
Tualatin-Sherwood Rd/Gerda Ln	B/F			B/F		
Brookman Rd/Ladd Hill Rd	A/B			A/B		
Edy Rd/Borchers Dr	**A/C**			**B**	**13.7**	**0.50**
Elwert Rd/Kruger Rd	A/B			A/B		
Elwert Rd/Swanstrom Dr	A/B			A/B		
Murdock Rd/Willamette St	A/B			A/B		
Oregon St/Lincoln St	A/B			A/B		
Oregon St/Tonquin Rd	A/E			A/E		
Pine St/Oregon St	A/D			A/D		
Sherwood Blvd/3rd St	A/D			A/D		
Sherwood Blvd/Century Dr	**A/F**			**B**	**18.7**	**0.51**
Sunset Blvd/Pine St	A/C			A/C		
Sunset Blvd/Woodhaven Dr	A/D			A/D		

Signalized and All-Way Stop Intersection LOS:
LOS = Level of Service, Delay = Average vehicle delay in the peak hour for entire intersection,
V/C = Volume to Capacity Ratio
Unsignalized Intersection LOS:
A/A=Major Street turn LOS/Minor street turn LOS
Roundabout Intersection LOS:
LOS = FHWA Methodology Level of Service, Delay = FHWA Methodology Level of Service,
V/C = HCM Methodology worst approach Volume to Capacity Ratio
* Indicates intersection where ODOT v/c thresholds apply.

Bold indicates locations where mitigations beyond those assumed in the model (described previously) were analyzed.

The Highway Capacity Manual Methodology for signalized intersection analysis treats each intersection as an isolated signal within a roadway system. Congested environments where upstream intersection operations impact signal operations (usually excessive vehicle queues) can be better analyzed using Synchro and SimTraffic, which considers the intersections as a system and simulates each vehicle passing through the system. A simulation model was created to analyze the signals along Tualatin-Sherwood Road and Roy Rogers Road between Borchers Drive and Langer Drive. Table 8-6 lists the delay at each of the intersections estimated by twenty simulation iterations. As shown in the table, the impact of upstream signals can have a significant effect on the actual vehicle delay.

Table 8-6: 2020 No-Build PM Peak Hour Simulated Intersection Delay

Intersection	Lowest Average Delay	Highest Average Delay	Median Average Delay	Corresponding HCM LOS
Roy Rogers/Borchers	27.8	260.7	128.8	F
Tualatin-Sherwood/ORE 99W	55.6	70.0	63.8	E
Tualatin-Sherwood/Regal Cinemas	41.4	168.4	87.9	F
Tualatin-Sherwood/Langer Drive	48.9	320.4	165.0	F

In addition to the intersection operation, average travel speed was analyzed using the 2020 No-Build forecasts and intersection operations. Table 8-7 lists the travel time runs forecasted for Tualatin-Sherwood Road and Highway 99W. Travel speeds on Tualatin-Sherwood Road are forecasted to decrease by 35 to 50 percent from existing conditions.

Preliminary Traffic Signal Warrants

Preliminary signal warrants[14] were evaluated at all unsignalized intersections in the project study under year 2020 No-Build and 2020 Build traffic volume conditions. The results of this analysis are shown in Table 8-8. Meeting signal warrants does not guarantee that a signal will be installed. Before a signal can be installed on a state highway, a traffic signal investigation must be conducted or reviewed by the Oregon Department of Transportation. Traffic signal warrants must be met and the State Highway Engineer approval obtained before a signal will be placed on a state highway. Signals on non-state facilities need to be reviewed and approved by appropriate local officials.

[14] Preliminary Signal Warrants, MUTCD Warrant 1 (Eight Hour Vehicular Volume). Eight hour volumes were estimated based on peak hour volumes.

Table 8-7: Average PM Peak Hour Travel Speeds and LOS

Route	Average Travel Speed (mph)		LOS	
	Existing	2020 No-Build	Existing	2020 No-Build
Tualatin-Sherwood Road Eastbound	30	19	B	D
Tualatin-Sherwood Road Westbound	27	13	C	E
Highway 99W Southbound	34	33	B	B
Highway 99W Northbound	34	30	B	B

Preliminary signal warrants were met under year 2020 Build traffic volume conditions at four of the study intersections in Sherwood. Since only peak hour traffic volumes were available for study intersections, peak hour volumes were factored to estimate eighth highest hour traffic volumes. Eighth highest hour volumes typically represent about 56.5 percent of peak hour volumes[15]. Therefore, peak hour volumes were multiplied by 0.565 to estimate eighth highest hour volumes. Condition A—Minimum Vehicular Volume reflects whether there is enough volume on both the main street and side street to warrant a traffic signal. Condition B—Interruption of Continuous Traffic is also a measure of volume, but puts more emphasis on the volume of the main street. If either Condition A or Condition B is met, Warrant 1 is met. Under some circumstances (when all other alternatives have been exhausted), Warrant 1 can be met if both Condition A and Condition B are met to the 80% level. Intersections meeting signal warrants should be analyzed further to determine if the intersection should be improved with a signal, turn lanes, a roundabout or increasing roadway connectivity.

[15] Based on surveys conducted by the Oregon Department of Transportation between 1991 and 1994.

Table 8-8: 2020 Signal Warrant Analysis

Intersection	2020 No-Build			2020 Build		
	Cond A Met	Cond B Met	Signal Warranted	Cond A Met	Cond B Met	Signal Warranted
ORE 99W/Brookman	No	80%	No	No	No	No
Tualatin-Sherwood/Gerda	No	No	No	No	No	No
Oregon/Tonquin	100%	100%	Yes	100%	No	Yes
Murdock/Willamette	No	No	No	No	No	No
Sunset/Murdock	80%	No	No	No	No	No
Sunset/Sherwood	100%	80%	Yes	100%	No	Yes
Edy/Elwert	No	No	No	No	No	No
Sherwood/Century	100%	100%	Yes	No	100%	Yes
Sherwood-Pine/3rd	No	No	No	No	80%	No
Pine/Oregon	100%	80%	Yes	80%	No	No
Washington/Railroad	No	No	No	No	No	No
Washington/3rd	No	No	No	No	No	No
Sherwood/Railroad	No	No	No	No	No	No
Cipole/Herman	No	No	No	No	No	No
Ladd Hill/Brookman	No	No	No	No	No	No
Sunset/Pine	No	80%	No	No	No	No
Sunset/Pinehurst	No	80%	No	No	80%	No
Sunset/Woodhaven	No	100%	Yes	No	80%	No
Elwert/Swanstrom	No	No	No	No	No	No
Elwert/Kruger	No	No	No	No	No	No
Borchers/Edy				100%	No	Yes
Oregon/Lincoln	No	No	No	No	No	No

System Circulation Alternatives

The 2020 traffic volume forecasts indicate significant growth on some facilities and negative growth on others. Selected model volumes for 2000 and 2020 summarized in Table 8-9 show substantial growth ORE 99W south of Tualatin-Sherwood Road, Tualatin-Sherwood Road and Sunset Boulevard. Negative growth is experienced on some facilities where planned improvements such as Adams Street and the downtown streets realignments redistribute traffic patterns. For example, Oregon Street between Tualatin-Sherwood Road and Tonquin Road is expected to decrease by 33% due to individuals taking the Adams Street connection between downtown and the northern section of Sherwood.

Table 8-9: Peak Hour Model Volumes (2000 and 2020)

Roadway	Segment	2000	2020	Percent Growth
ORE 99W	Tualatin-Sherwood north to Home Depot	2,700	2,800	4%
	Tualatin-Sherwood south to Sherwood Boulevard	3,250	4,000	23%
Tualatin-Sherwood Rd	ORE 99W to Langer	1,450	2,250	55%
Roy Rogers Road	ORE 99W to Borchers	875	1,000	14%
Oregon Street	Tualatin-Sherwood to Tonquin	900	600	-33%
Sherwood Boulevard	ORE 99W to Langer	700	575	-18%
	Century to 3rd	900	750	-17%
Sunset Boulevard	Pinehurst Drive to Sherwood Blvd	420	825	96%

I-5/Highway 99W Connector

Washington County and Metro are pursuing goal exceptions to make land use decisions regarding need, mode, function and general location for the bypass. In addition, Washington County is currently conducting an alignment study. When goal exceptions are in place, the city should amend the TSP to add the connector as a planned facility consistent with the county plan and goal exception. When the county completes studies to select a preferred alignment, the TSP should be amended to include the preferred alignment.

Outstanding 2020 Circulation Issues

Several deficiencies in the city, county or state street facilities were found that require further study. Alternative measures have been explored on a preliminary basis to identify possible performance gains, but further study will be required to select the preferred solutions.

Table 8-10: Outstanding Circulation Issues for 2020

Location / Key Issues	Possible Solutions / Options
Sherwood Bl. / Langer ▪ Close spacing between major public street intersections including Highway 99, Langer Road, and Century Drive - 12th Street. Vehicle queues on Sherwood Boulevard can temporarily block upstream intersections during heavy use periods. ▪ Limited alternative north-south circulation routes from retail on Langer to destinations in central and south city. Modifying existing provision could make for major out-of-direction travel. ▪ Sherwood Boulevard is designated as a Collector facility. ▪ High cross street turning volumes near retail uses and schools.	1. Restricted access at existing intersection with Sherwood at Langer. Removal or modification of existing traffic signal Eliminates queue blocking from ORE 99W signal. 2. Install new traffic signal or roundabout at Century Drive - 12th Street intersection as secondary access to retail site, and improved access from Century Drive and the planned Adams Street extension.
Elwert / Kruger / ORE 99W ▪ Close spacing between ORE 99W and the north leg of Elwert Road (less than 100 feet) makes for awkward and potentially unsafe turning maneuvers. ▪ Urban Growth Boundary (UGB) is located along the west edge of Elwert Road. Roadway capacity improvements outside the UGB has major restrictions. ▪ Existing farm house west of intersection limits possible street re-alignments.	1. Realign Elwert Road approach so that intersection at ORE 99W opposite Sunset Drive is closer to 90 degrees. 2. Relocate and realign Kruger Road to intersect Elwert Road at least 500 feet from ORE 99W intersection.
Edy Road / Borchers Drive ▪ Close spacing to ORE 99W creates operational conflicts with queued vehicles spilling back from ORE 99W to block Borchers Drive intersection. ▪ Existing STOP sign controls on minor street approach will not be sufficient to serve future demands. ▪ Intersection will have long delays for vehicles on Borchers Drive bound to ORE 99W during peak periods.	1. Install traffic signal controls that are coordinated with the ORE 99W intersection to reduce vehicle queue impacts. 2. Consider a roundabout installation at the Edy / Borchers intersection.
Oregon Street / Tonquin Road ▪ Intersection likely to fail over the next 20 years without any improvements. ▪ Existing roundabout at Murdock Road is	1. Evaluate potential roundabout design. Operations appear to be feasible with adjoining intersection at Murdock Road, given the volumes and adjacent "T" shaped intersections. However, the grade on Oregon

Location / Key Issues	Possible Solutions / Options
roughly 200 feet further south.	Street to the north and the slope in the northeast corner of this intersection may make the roundabout design inappropriate. 2. Traffic signal controls at Oregon / Tonquin were considered, but there were significant safety concerns about the close spacing to the roundabout, and the negative effects of vehicles slowing or stopping so close to the exit leg of the roundabout.
<u>Langer Drive / Tualatin - Sherwood Road</u> ▪ Signal spacing on Tualatin-Sherwood Road should be 1,000 feet apart. ▪ Existing and planned signals do not comply with this standard. ▪ North-south cross circulation is limited for retail services.	1. Existing traffic signal may need to be removed or modified once new signal on Tualatin-Sherwood Road at Adams Street is built. 2. Signals on Tualatin-Sherwood Road should be interconnected to minimize delays for east-west traffic.
<u>I-5 / ORE 99W Connector</u> ▪ Alternative routing for east-west commuter and freight traffic under study by Washington County and ODOT. ▪ New facility could significantly reduce travel demands forecasted for Tualatin-Sherwood Road corridor presented in this report.	When the Connector Study is complete (anticipated for late 2004), this TSP should be updated or amended to reflect any recommendations from the I-5/ORE 99W Connector Study directly (or indirectly) affecting Sherwood.

ORE 99W Access Control. Several discussions were held between City and ODOT staff regarding access control along ORE 99W. A general access control plan has been agreed upon (i.e. where access will be allowed on ORE 99W in Sherwood). However, there has been some concern on the part of both ODOT and the City that by limiting all access to right-in, right-out only (de facto, by having a raised median in the center of the highway) will create the need for a large number of U-turns at signalized intersections (in particular, Sunset/ORE 99W). Based on preliminary development plans for properties located between Meinecke (the next traffic signal to the north) and Sunset, it was determined that this would likely not be an issue and that the planned capacity at that intersection could handle the volume of u-turning traffic that might be expected.

Improvements

Motor Vehicle Master Plan

The improvements needed to mitigate 2020 future conditions combine both those identified in prior plans (the Washington County TSP, Metro's RTP, and the ODOT STIP) and those determined as the outcome of the Transportation System Plan analysis. The improvements are shown in Figure 8-9 and listed in Table 8-11.

The cost estimates shown in these tables are taken from prior plan documents, or are estimated by DKS Associates using standard assumptions for new facilities. Further refinement should be made of these estimates prior to capital budgeting.

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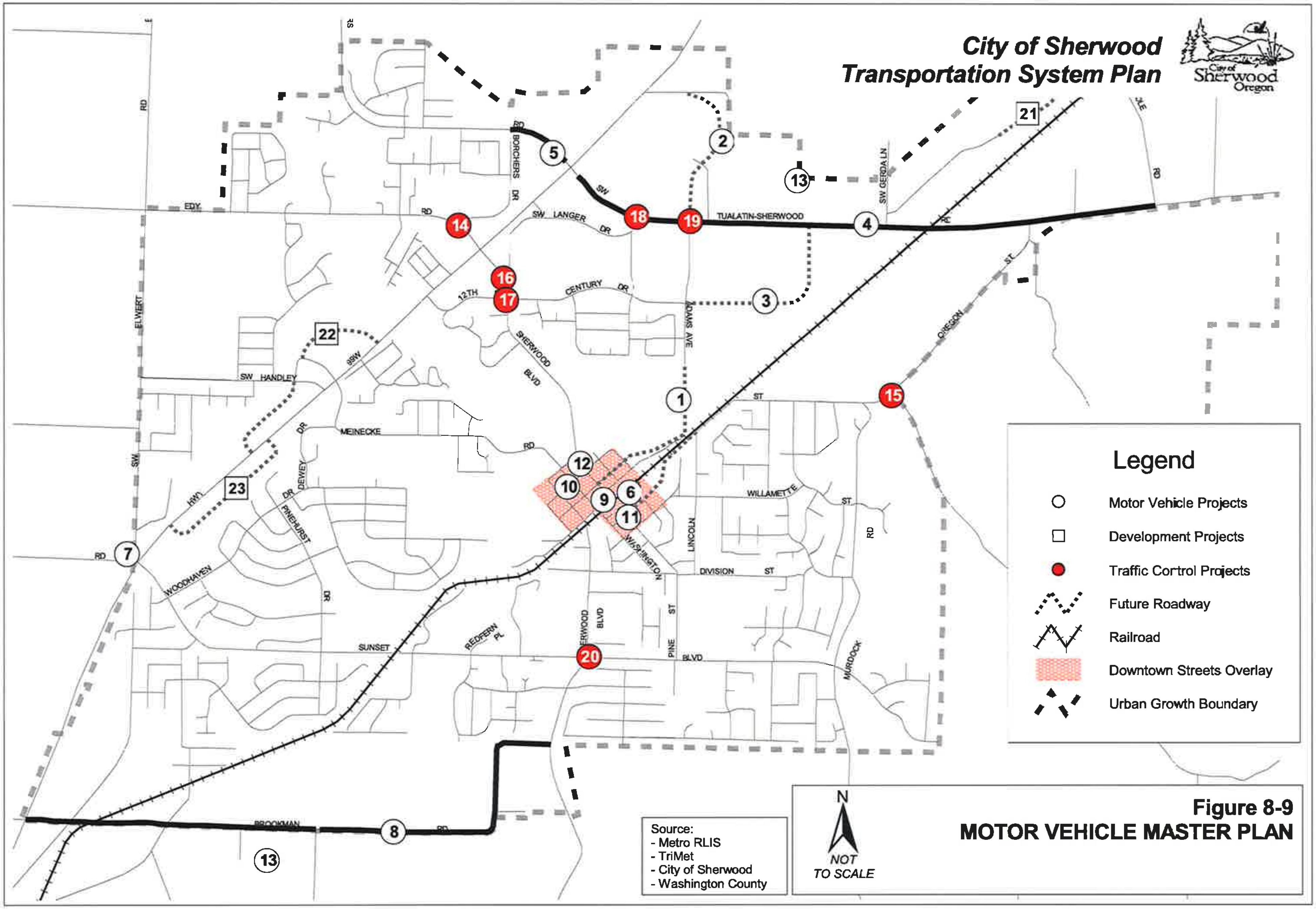

Figure 8-9
MOTOR VEHICLE MASTER PLAN

Table 8-11: City Street Projects

ID	Location	From	To	Project	Source*	Cost ($1,000's)
				City Funded Motor Vehicle Projects		
1	Adams Avenue	Pine Street	Tualatin-Sherwood Road	Construction of 3 lane road	CIP/TSP	$6,100
2	Adams Avenue	Tualatin-Sherwood Road	Home Depot	Construction of 3 lane road	CIP/TSP	$2,200
3	Century Drive	Adams Avenue	Tualatin-Sherwood Road	Construction of 3 lane road	TSP	$2,800
4/5	Tualatin-Sherwood Road	Cipole Road	Borchers Drive	Signal timing/interconnect project	TSP	$50
6	Oregon Street	Lincoln Street	Pine Street	Extension/realignment (3 lanes)	CIP	$2,800
9	Pine Street	Willamette	Sunset	Extension across rail road tracks	CIP	$2,550
10	Old Town Streets			Phase 1 of the Downtown Sherwood Streetscape Master Plan	City	$10,800
11	Cannery Arterials*			Phase 2 of the Downtown Sherwood Streetscape Master Plan	City	$2,550
12	Future Phases*			Phase 3-6 of the Downtown Sherwood Streetscape Master Plan	City	$4,700
13	I-5/Hwy 99W Connector	Highway 99W	Interstate 5	Specific alignment to be determined	RTP	N/A
Subtotal (City)						*$34,550*
				County Funded Motor Vehicle Projects		
4	Tualatin-Sherwood Road	Hwy 99W	Cipole Road	Widen existing road to 5 lanes	RTP/Washington County TSP	$15,900
5	Roy Rodgers Road	Borchers Drive	Hwy 99W	Widen existing road to 5 lanes	RTP/Washington County TSP	$1,450
7	Elwert Road	ORE 99W	Kruger	Intersection safety improvement	TSP	$1,550
8	Brookman Road	ORE 99W	Ladd Hill Road	Improve to collector standards	TSP	$9,000
Subtotal (County)						*$27,900*

Development Related Projects

ID	Location	From	To	Project Description	Source*	Cost ($1,000's)
21	Galbrieth Drive	Gerda Lane	Cipole Road	Construction of 2 lane road	TSP	$1,550
22	Cedar Brook Way	ORE 99W	ORE 99W	Construction of 2 lane road	TSP	$3,700
23	South Loop Road	ORE 99W	ORE 99W	Construction of 2 lane road	TSP	$1,900
11	Cannery Arterials**			Phase 2 of the downtown Sherwood Streetscape Master Plan	City	$1,150
12	Future Phases**			Phase 3-6 of the Downtown Sherwood Streetscape Master Plan	City	$1,050
Subtotal (Development Related Projects)						*$9,350*

Traffic Control Enhancements (City Funded)

ID	Location	Project Description	Source*	Cost ($1,000's)
14	Edy Road/Borchers Drive	Additional traffic control measure	TSP, CIP	$300
15	Langer Drive/Tualatin-Sherwood Road	Remove Traffic Signal. Install raised median	TSP	$100
16	Sherwood Boulevard/Langer Drive	Remove Traffic Signal. Allow lefts in only (no lefts from Langer to Sherwood)	TSP	$150
17	Sherwood Boulevard/Century Drive	Install Traffic Signal or Roundabout	TSP	$275
18	Oregon Street/Tonquin Road	Traffic Control Enhancement (consider roundabout)	TSP	$1,000
19	Adams Street/Tualatin-Sherwood Road	Install Traffic Signal	TSP	$250
20	Sherwood Blvd/Sunset Blvd	Traffic Control Enhancement	TSP	$250
Subtotal (Traffic Control Enhancements)				$2,325
Total (City Funded)				***$36,875***
Total (Other Funding: State, Region, Development)				*$37,250*

* Source: RTP=Metro's Regional Transportation System Plan, TSP=Mitigation Required Based on Sherwood TSP Analysis, CIP=City of Sherwood Capital Improvement Plan.

** Project costs paid through public/private partnership.

Traffic Control Master Plan

To guide future implementation of traffic signals to locations that have the maximum public benefit by serving arterial/collector/neighborhood routes, a framework master plan of traffic signal locations was developed (Figure 8-10). 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. The following key traffic signal issue should be addressed within the transportation policy of Sherwood:

> Establish 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 could 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 placement 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.

Emergency Vehicle Preemption – Some of 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 required for every traffic signal in the city.

Traffic Signal Coordination – The existing traffic signals along Tualatin-Sherwood Road are not configured to provide progressive traffic flow through town. There is no interconnect or coordinated signal timings. Interconnect and coordinated signal timings should be conducted for the traffic signals along Tualatin-Sherwood/Roy Rodgers Roads between Borchers and Langer (to include Adams Street once it is built). Modern interconnect is preferred and could be either modem interconnect or radio interconnect, depending upon the specific conditions. There are existing loop detectors, so during peak periods when volume fluctuates, the controllers are responsive to changes in demand on an individual intersection basis. To upgrade these signals will likely require upgraded communication (either modem or radio interconnect) and new signal timing plans. The upgrade cost may range up to $5,000 per signal.

ORE 99W/Tualatin-Sherwood Road Gap Out Time – In conducting baseline intersection analysis, it was noted that the "gap out" time between vehicles at the ORE 99W/Tualatin-Sherwood Road intersection is set to a very short 0.5 second. Simulations runs indicated that the signal would often "gap out" before the queue was exhausted or before "max green" was reached, because the next vehicle in the queue could not get to the loop detector fast enough. By setting the "gap out" time to 1.0 second, the analysis indicates that the intersection would work much better, with queues clearing on a regular basis. This is something a signal technician could adjust fairly easily in the field and would likely have a significant positive impact on the operation of this intersection.

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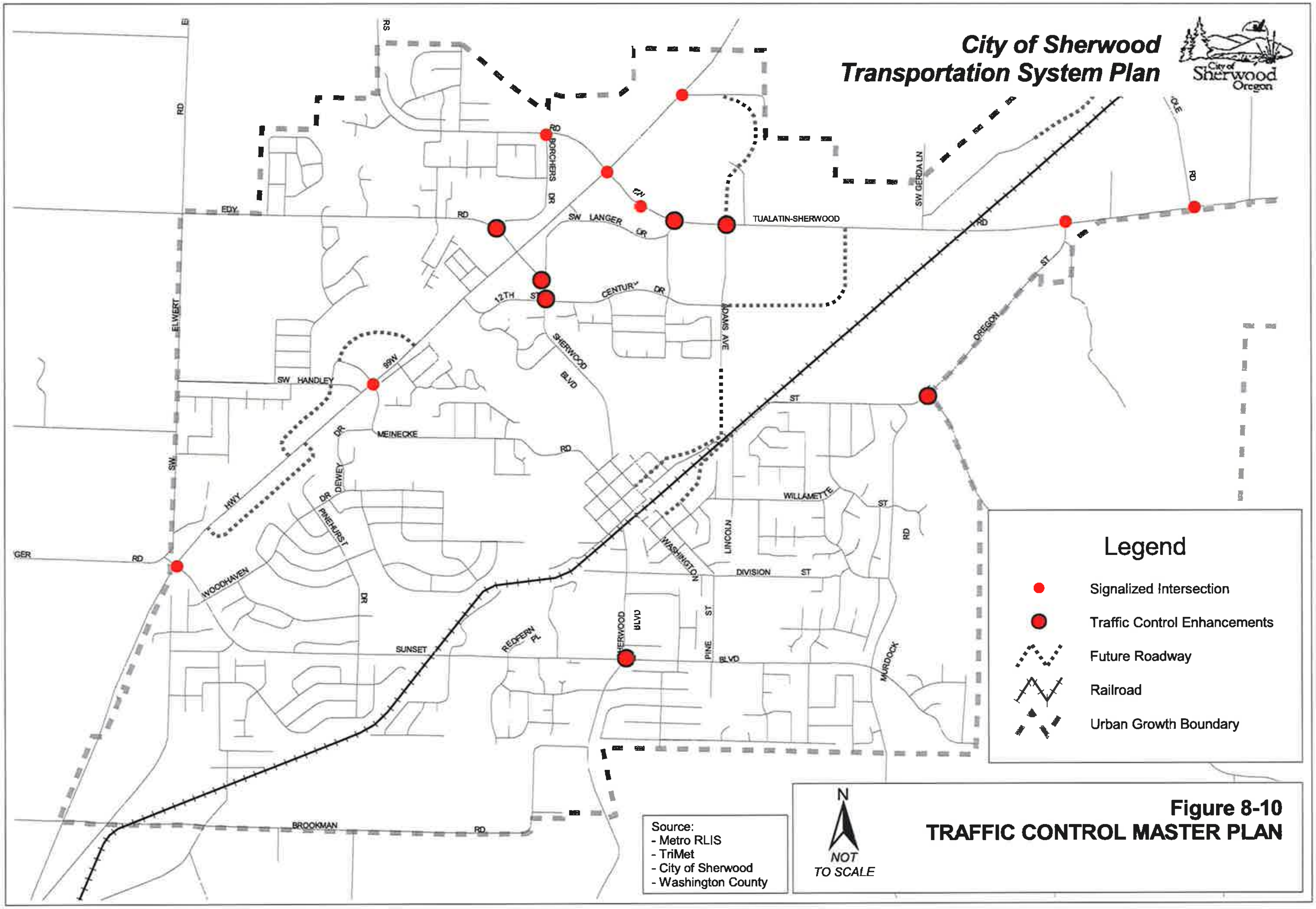

Source:
- Metro RLIS
- TriMet
- City of Sherwood
- Washington County

Figure 8-10
TRAFFIC CONTROL MASTER PLAN

Access Management

Access Management is a broad set of techniques that balance the need to provide efficient, safe and timely travel with the ability to allow access to the individual destination. ODOT and Washington County have clear access management policies and the supporting documentation to ensure that the highway system is managed as wisely as possible for the traveling public. Proper implementation of Access Management techniques should guarantee reduced congestion, reduced accident rates, less need for highway widening, conservation of energy, and reduced air pollution.

Access management is control or limiting of access on arterial and collector facilities to preserve their functional capacity. Numerous driveways erode the capacity of arterial and collector roadways. Preservation of capacity is particularly important on higher volume roadways for maintaining traffic flow and mobility. Whereas 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. Sherwood, as with every city, needs a balance of streets that provide access with streets that serve mobility.

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

- Provide left turn lanes where warranted for access onto cross streets
- Work with land use development applications to consolidate driveways where feasible
- Meet ODOT and Washington County access requirements on arterials and collectors
- Establish City access standards for new developments on collectors and arterials

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 Sherwood where property owners consume substantial staff time on issues of residential fronting impacts after they have chosen to build adjacent to an arterial.

Use Washington County and ODOT standards for access on arterials and collectors under their jurisdiction.

Washington County standards are 100 feet on Collectors and 600 feet on Arterials[1].

ODOT standards (applies only to ORE 99W) are 990 feet from the center of one access point to the center of the adjacent access point on the same side of the roadway. A minor deviation may be available (with justification) to allow down to 530 feet between driveways and down to 740 feet between public streets. Any request to deviate beyond these limits is considered a major deviation[2].

Specific access management plans be developed for arterial streets in Sherwood to maximize the capacity of the existing facilities and protect their functional integrity. New development and roadway projects should meet the requirements summarized in Table 8-12. The minimum spacing of roadways and driveways listed in this table is consistent with Washington County's access spacing standards.

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[1] Washington County Community Development Code, Article V: Public Facilities and Services, 501-8.5 (A).
[2] *1999 Oregon Highway Plan*, Appendix C, Access Management Standards.

Table 8-12: Access Spacing Standards for City Street Facilities

Street Facility	Maximum spacing of roadways and driveways	Minimum spacing of roadways and driveways
Arterial	1,000 feet	600 feet
Collector:	400 feet	100 feet
All Roads	Require an access report stating that the driveway/roadway is safe as designed meeting adequate stacking, sight distance and deceleration requirements as set by ODOT, Washington County and AASHTO.	

Access management is not easy to implement and requires long institutional memory of the impacts of short access spacing – increased collisions, reduced capacity, poor sight distance and greater pedestrian exposure to vehicle conflicts. The most common opposition response to access control is that "there are driveways all over the place at closer spacing than mine – just look out there". These statements are commonly made without historical reference. Many of the pre-existing driveways that do not meet access spacing requirements were put in when traffic volumes were substantially lower and no access spacing criteria were mandated. With higher and higher traffic volume in the future, the need for access control on all arterial roadways is critical – the outcome of not managing access properly is additional wider roadways which have much greater impact than access control.

Staff will have to come back at a later date to propose revisions to the development code to reflect the standards being developed in the Transportation System Plan and Comprehensive Plan. At that time, additional attention can be given to the specific standards and whether exceptions are appropriate to be written into the code or if variances are the action needed. Four standards are:

First, a restriction of direct access of new single-family units on arterials and collectors (this would include an exception process that addresses safety and neighborhood traffic management needs).

Second, an access report with new land development that requires applicants to verify design of their driveways and streets are safe meeting adequate stacking needs, sight distance and deceleration standards as set by ODOT, Washington County, the City and AASHTO (utilizing future traffic volumes from this plan as a future base for evaluation). Where possible, new developments should be required to provide "cross-over easements" as a condition to approval, thus insuring shared driveway access points.

Third, driveways should not be placed in the influence area of intersections. The influence area is that area where queues of traffic commonly form on the approach to an intersection (typically between 150 to 300 feet). In a case where a project has less than 150 feet of frontage, the site would need to explore potential shared access, or if that were not practical, place driveways as far from the intersection as the frontage would allow (permitting for 5 feet from the property line).

Fourth, access to principal arterials should only be from public roads. When a site that has private access onto a principal arterial is redeveloped, the private access will be eliminated if alternate access exists to the site.

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. The following goals and policies pertaining to freight movement and facilities have been developed as part of this Transportation System Plan.

Goal 4: Develop complementary infrastructure for bicycles and pedestrian facilities to provide a diverse range of transportation choices for city residents.

> Policy 7—The City of Sherwood shall pursue traffic calming techniques for neighborhood and local streets so as to provide safe passage for pedestrians and bicyclists, and a more pleasant neighborhood environment for residents.
>
> Policy 8—The City of Sherwood shall provide design standards for roadway traffic calming features such as traffic circles, curb extensions, bulb-outs, and speed humps.

The following are examples of neighborhood traffic management strategies:

- speed cushions (similar to speed hump, but allows emergency vehicles to avoid traversing the hump)
- 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 Sherwood 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 is 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 Sherwood 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 8-13 summarizes nationwide research of over 120 agencies in North America.

The City could consider adopting a neighborhood traffic management program. This program would 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, the required public process, use on collectors/arterials (fewer acceptable measures – medians) and how to integrate NTM into all new development design. A toolbox of traffic calming techniques is included in the appendix.

Table 8-13: Neighborhood Traffic Management Effectiveness

Measures	Speed Reduction (MPH)				Volume Change (ADT)			Public Satisfaction
	No. of Studies	Low	High	Average	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.*

Transportation System Management

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), 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[3]. This can be done without the major cost of roadway widening.

Intelligent Transportation Systems

Several of the motor vehicle strategies include facilities and programs that involve Intelligent Transportation Systems (ITS). 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 ITS element 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). Some of this information will be produced by Sherwood, but most will be developed by ODOT, Washington County 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.

Washington County is currently developing a regional ITS Plan. Sherwood should participate in and support this process. Any recommendations from that plan should be incorporated in the next cycle of Transportation System Plan periodic reviews.

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

Transportation Demand Management (TDM)

The Transportation Planning Rule outlines a goal of reducing vehicle miles traveled (VMT) per capita. Transportation Demand Management (TDM) is the general term used to describe any action that removes single occupant vehicle trips from the roadway network during peak travel demand periods. TDM measures applied on a regional basis can be an effective tool in reducing vehicle miles traveled. Additionally, the Employee Commute Options (ECO) program administered by the Department of Environmental Quality (DEQ) under OAR 340-20-047 requires larger employers (more than 50 employees) to provide commute options that encourage employees to reduce auto trips to the work site. The following goal and policy pertaining to TDM have been developed as part of this Transportation System Plan.

Goal 2: Develop a transportation system that is consistent with the City's adopted comprehensive land use plan and with the adopted plans of state, local, and regional jurisdictions.

> Policy 6— The City will work with Metro and other regional transportation partners to implement regional transportation demand management programs where appropriate.

TDM samples include:

- Employers installing bicycle racks, lockers and shower facilities
- 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
- Business/government agencies with 50 or more employees develop TDM standards and programs to reduce peak hour traffic

TDM can include a wide variety of actions tailored to the individual needs of employers to achieve trip reduction. Table 8-14 provides a list of several strategies identified by Oregon's Employee Commute Option (ECO) program on TDM[4]. Research has indicated that a comprehensive set of complementary policies implemented over a large geographic area can have an effect on vehicle miles traveled[5]. However, the emphasis of much of the research indicates that these policies must go well beyond the low-cost, uncontroversial measures commonly attributed to TDM (such as carpooling, transportation coordinators/associations, priority parking spaces) to be effective. Elements including parking and congestion pricing, improved services for alternative modes and other market-based measures are needed for TDM to have significant impact on reducing overall vehicle miles traveled.

[4] Oregon's Employee Commute Option (ECO) program.

[5] *The Potential for Land Use Demand Management Policies to Reduce Automobile Trips*, ODOT, by ECO Northwest, June 1992.

Table 8-14: Transportation Demand Management Strategies

Strategy	Description	Potential Trip Reduction	
Telecommuting	Employees perform regular work duties at home or at a work center closer to home, rather than commuting from home to work. This can be full time or on selected work days. This can require computer equipment to be most effective.	82-91% 14-36%	(Full Time) (1-2 day/wk)
Compressed Work Week	Schedule where employees work their regular scheduled number of hours in fewer days per week (for example, a 40 hour week in 4 days or 36 hours in 3 days)	7-9% 16-18% 32-36%	(9 day/80 hr) (4/40) (3/36)
Transit Pass Subsidy	For employees who take transit to work on a regular basis, the employer pays for all or part of the cost of a monthly transit pass.	19-32% 2-3%	(full subsidy, high transit service) (half subsidy, medium transit service)
Cash Out Employee Parking	An employer that has been subsidizing parking (free parking) discontinues the subsidy and charges all employees for parking. An amount equivalent to the previous subsidy is then provided to each employee, who then can decide which mode of travel to use (with subsidy above the cost of a monthly transit pass, those employees would realize monetary gain for using transit).	8-20 % 5-9 % 2-4%	(high transit service available) (medium transit services available) (low transit services available)
Reduced Parking Cost for HOVs	Parking costs charged to employees are reduced for high occupancy vehicles (HOV) such as carpools and vanpools.	1-3 %	
Alternative Mode Subsidy	For employees that commute to work by modes other than driving alone, the employer provides a monetary bonus to the employee. Most often, the bonus is provided monthly in the employee's paycheck.	21-34% 2-4%	(full subsidy of cost, high alt.modes) (half subsidy of cost,medium alt.modes)
On-Site Services	Provide services at the worksite that are frequently used by the employees of that worksite. Examples include cafes, restaurants, dry cleaners, day care and bank machines.	1-2 %	
Bicycle Program	Provides support services to those employees that bicycle to work. Examples include: safe/secure bicycle storage, shower facilities and subsidy of commute bicycle purchase.	0-10 %	
On-site Rideshare Matching for HOVs	Employees who are interested in carpooling or vanpooling provide information to a transportation coordinator regarding their work hours, availability of a vehicle and place of residence. The coordinator then matches employees who can reasonably rideshare together.	1-2 %	
Provide Vanpools	Employees that live near each other are organized into a vanpool for their trip to work. The employer may subsidize the cost of operation and maintaining the van.	15-25% 30-40%	(company provided van with fee) (company subsidized van)
Gift/Awards for Alternative Mode	Employees are offered the opportunity to receive a gift or an award for using modes other than driving	0-3 %	

Strategy	Description	Potential Trip Reduction
Use	alone.	
Provide Buspools	Employees that live near each other or along a specified route are organized into a buspool for their trip to work	3-11 %
Walking Program	Provide support services for those who walk to work. This could include buying walking shoes or providing showers.	0-3 %
Company Cars for Business Travel	Employees are allowed to use company cars for business-related travel during the day.	0-1 %
Guaranteed Ride Home Program	A company owned or leased vehicle or taxi fare is provided in the case of an emergency for employees that use alternative modes.	1-3 %
Time off with Pay for Alternative Mode Use	Employees are offered time off with pay as an incentive to use alternative modes (rather than monetary, bonus, gift or awards)	1-2 %

SOURCE: *Guidance for Estimating Trip Reductions From Commute Options*, Oregon Department of Environmental Quality, August 1996.

At the same time, the same research indicates that employee trip reduction programs can be an effective instrument of localized congestion relief[6]. For example, employers can substantially reduce peak hour trips by shifting work schedules, which may not reduce VMT but can effectively manage congestion. In Wilsonville, Oregon, a Nike warehouse/distribution site generates 80% less vehicle trips than standard similar uses in the evening peak hour by using employee shifts that are outside the peak period (4 - 6 PM) [7]. This type of congestion management technique can extend the capacity of transportation facilities.

Strategies

Several strategies were developed for transportation demand management in Sherwood. These strategies are aimed at providing the City with priorities toward implementing transportation demand management projects that meet the goals and policies of the City. The ranking of the strategies follows from most important to least important:

- Support regional TDM policies/strategies
- Telecommuting/Fiber Optic to all residents and businesses
- Mandate TDM though development review
- Limiting Parking (establish maximum parking ratios)
- Provide business association support for TDM coordination

TDM Plan

State and regional policy[8] both call for encouraging and promoting transportation demand

[6] *Evaluation of Employee Trip Reduction Programs Based upon California's Experience with Regulation XV*, Institute of Transportation Engineers, Technical Council Committee 6Y-51, January 1994.

[7] *Nike Parking Lot Expansion Trip Generation Study*, City of Wilsonville, by DKS Associates, May 1997.

[8] Oregon's Transportation Planning Rule; Metro's Regional Transportation Plan and Washington County's Transportation System Plan.

management. The policy of this plan calls for the city to support TDM. Collectively, the implementation of the modal plans in this TSP, along with the TDM plan, will contribute to regional commuter vehicle mile reduction goals. Unlike bicycles, pedestrians and motor vehicles, implementation of this policy does not necessarily require capital infrastructure. In fact, much more of TDM is policy and management rather than concrete and asphalt. Because of this, the TDM plan for Sherwood consists of the following:

- Support continued efforts by Washington County, Metro and ODOT to develop productive TDM measures that reduce commuter vehicle miles and peak hour trips.
- Encourage the development of high speed communication in all parts of the city (fiber optic, digital cable, DSL, etc.). The objective would be to allow employers and residents the maximum opportunity to rely upon other systems for conducting business and activities than the transportation system during peak periods.
- Encourage developments that effectively mix land uses to reduce vehicle trip generation. These plans may include development of linkages (particularly non-auto) that support greater use of alternative modes.
- Mixed land use projects have demonstrated the ability to reduce vehicle trips by capturing internal trips between land use types, encouraging walk/bike trips and producing shorter vehicle trips[9].

As vehicle traffic levels increase with the build out of land uses within Sherwood, it may become necessary to go beyond the coordination with the regional programs. This may include developing localized TDM programs for the city to address vehicle trip reduction. For example, measures which are appropriate for site planning such as close-in parking for carpools, bicycle parking and convenient transit stops could be included as part of the Community Development Code.

Trucks

Efficient truck movement plays a vital role in maintaining and developing Sherwood'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 Sherwood are different than trucks making local deliveries. The transportation system should be planned to accommodate this goods movement need. The following goals and policies pertaining to freight movement and facilities have been developed as part of this Transportation System Plan.

Goal 7: Ensure that efficient and effective freight transportation infrastructure is developed and maintained to support local and regional economic expansion and diversification consistent with City economic plans and policies.

- Policy 1—The City of Sherwood will collaborate with federal, state and neighboring local governments and private business to ensure the investment in transportation infrastructure and services deemed necessary by the City to meet current and future demand for industrial and commercial freight movement.
- Policy 2—The City of Sherwood will adopt implementing regulations that provide for safe and convenient access to industrial and commercial areas for commercial vehicles, including freight loading and transfer facilities.

[9] *Trip Generation, 5th* edition, Institute of Transportation Engineers, 1991, Chapter VII, indicates potential for PM peak hour capture of between 27% and 66%.

- Policy 3—The City of Sherwood will work cooperatively with local, regional and state agencies to protect the viability of truck and freight service routes within and through the City of Sherwood, especially for Pacific Highway 99-W, the Tualatin-Sherwood Highway, and the planned I-5/Hwy 99-W Connector corridor.
- Policy 4—The City of Sherwood will work cooperatively with local, regional and state governments to ensure there is adequate air transportation infrastructure to serve local needs at regional airport facilities, including the Hillsboro Airport and Portland International airport.
- Policy 5—The City of Sherwood will strongly encourage the preservation of rail rights-of-way for future rail uses, and will work with appropriate agencies to ensure the availability of rail services to its industrial lands.
- Policy 6—The City of Sherwood will cooperate with local, regional and state governments to provide for regional marine freight infrastructure sufficient to serve local needs.
- Policy 7— The City of Sherwood will cooperate with the Portland Development Commission, Port of Portland, Washington County, and other economic development agencies to ensure the availability of inter-modal connectivity facilities deemed necessary to facilitate seamless freight transfer between all transport modes.

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 through truck routes in Sherwood were developed (Figure 8-11). This map is built from the Regional Transportation System Plan Freight System Map (2001) and this plan.

The plan 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, they should relate to the regional freight system. The Regional Transportation Plan[10] includes the following routes in the regional freight system in Sherwood, which is consistent with the city map:

- ORE 99W
- Tualatin-Sherwood Road

The truck route plan for the city is consistent with the RTP designations. Washington County is currently in the process of conducting and I-5/ORE 99W Connector Study. The purpose of this study is to determine a preferred alignment for an arterial-level, truck route, connector between I-5 and ORE 99W. At this time, no preliminary alignments have been selected. The connector could be located either north or south of the City. The proposed connector is an important facility for moving trucks through Sherwood. It will provide relief for Tualatin-Sherwood Road and will provide an additional east-west route for all vehicular traffic. Once a preferred alignment has been selected, the TSP should be amended to include the connector as a truck route.

[10] *2000 Regional Transportation Plan*, Metro, Adopted by Ordinance No. 00-869A and Resolution No. 00-2968B, Regional Freight System Map.

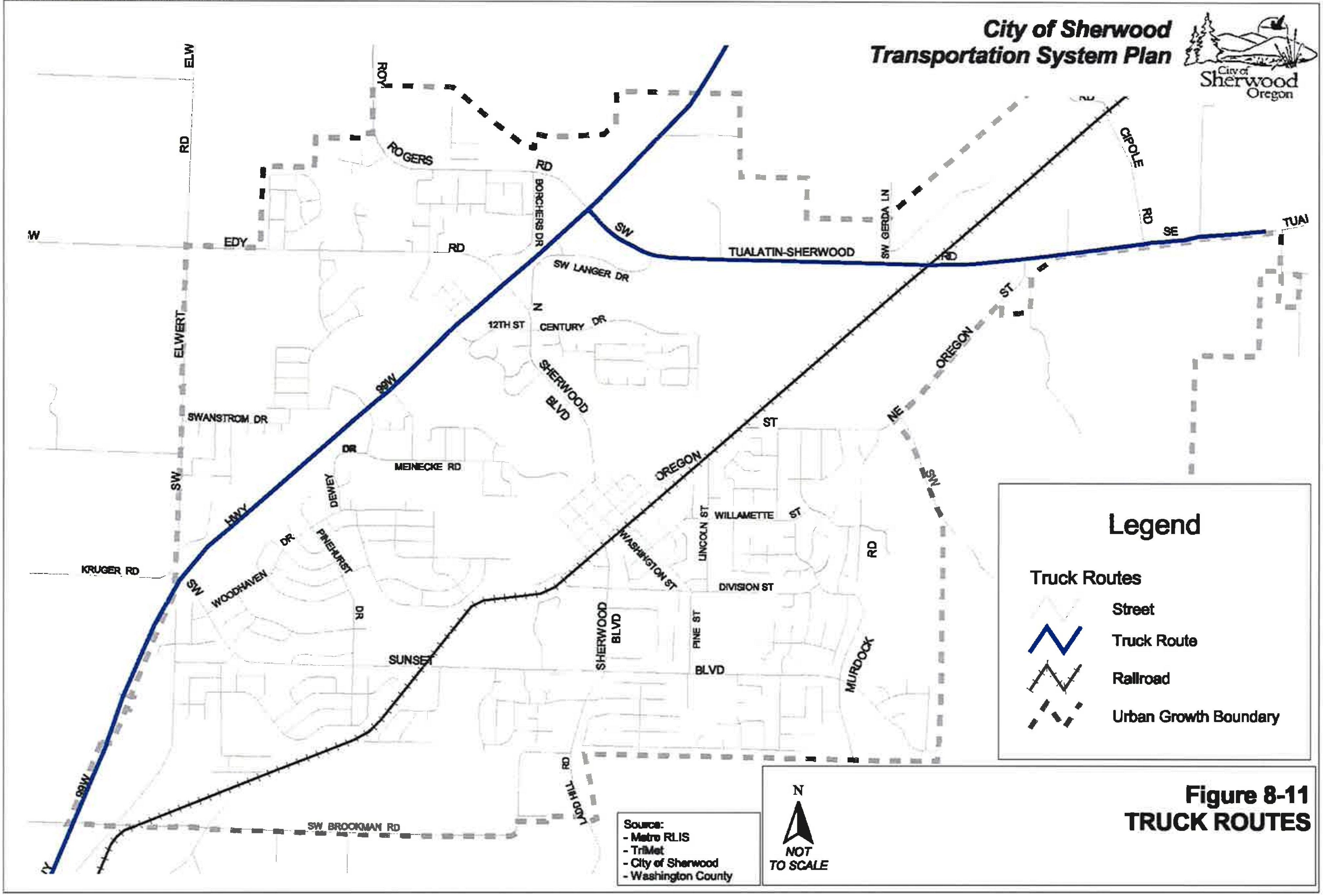

Figure 8-11
TRUCK ROUTES

9. OTHER MODES

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

Criteria

The following goals and policies pertaining to rail, pipeline, air and water facilities have been developed as part of this Transportation System Plan.

Goal 1: Provide a supportive transportation network to the land use plan that provides opportunities for transportation choices and the use of alternative modes serving all residential areas and businesses.

- Policy 5—The City shall work cooperatively with the Port of Portland and local governments in the region to ensure sufficient air and marine passenger access for Sherwood residents.

Goal 5: Provide reliable convenient transit service to Sherwood residents and businesses as well as special-transit options for the city's elderly and disabled residents.

- Policy 7—The City of Sherwood will support regional efforts for the preservation and development of appropriate rail rights-of-way for passenger rail service, in particular for serving local and regional commuter rail needs in Washington County, Clackamas County, and Yamhill County.

Facilities

Future needs for these modes of transportation are identified by their providers and are summarized below as they are understood.

Rail

The rail line in Sherwood is operated by Portland & Western (P&W), a sister company of Willamette & Pacific (W&P) Railroad and a subsidiary of Genesee & Wyoming Incorporated. The line runs north and west of Sherwood, passing through Tualatin and Lake Oswego on its way to the Willamette River crossing. According to P&W staff[1], there are currently two to four freight trains per day through Sherwood at 25 miles per hour. The trains vary in length from six to 60 cars. There is no fixed schedule for these trains. The volume, length and schedule of these freight trains are not expected to change significantly over the 20 year planning horizon.

[1] Per e-mail from Charles Kettenring, Assistant Vice President Engineering, Portland & Western Railroad, Inc., December 9, 2003.

The City is in the process of changing its downtown street network. The proposed changes will potentially affect at-grade rail crossings in Sherwood. Specifically, Oregon Street is being realigned to the southeast of the tracks, meeting Pine Street at Columbia Street, eliminating an at-grade rail crossing for motor vehicles. However, emergency vehicles will be permitted to cross (especially important for the adjacent fire station) and the crossing will be reconstructed to include new pedestrian/bicycle crossings. Also, Washington Street is planned to be vacated in the vicinity of the railroad track, eliminating a second at-grade crossing. Pine Street is to be extended across the track, creating an additional at-grade crossing. Overall, the downtown streets realignment plan would remove two at-grade crossings and add one, for a net reduction of one at-grade crossing. The crossing at Pine Street should be a gate-controlled crossing and should be coordinated with Portland & Western. These changes will need to be worked out in conjunction with P&W Railroad and the ODOT Rail division.

There has been some discussion regionally about the possibility of Commuter Rail extended from Tualatin into Sherwood along the existing P&W right-of-way. Currently, there are no specific plans for a project of this nature, but its possibility should be considered when making any changes in the vicinity of the P&W right-of-way. P&W staff have indicated that there are plans for upgrading this line to double track for commuter service between Portland and McMinnville. Speed will be 60 miles per hour and number of passenger trains will be about 30[2].

Pipeline

Northwest Natural operates several high-pressure pipelines that serve Sherwood. These lines run along Elwert Road, Cipole Road, Tualatin-Sherwood Road and Oregon Street. In addition, Kinder Morgan operates a petroleum gas line (gasoline and diesel) that runs from the Port of Portland to Eugene through the eastern part of Sherwood.

NW Natural has is in the process of constructing the South Mist Pipeline Extension Project. This project includes 24 inch high pressure pipeline on the outskirts of Sherwood. NW Natural is building the 62-mile (overall) transmission line to link its underground storage fields near Mist to the interstate pipeline gate station near Molalla. The project will allow the company to adequately serve customers on Portland' growing south and west sides by increasing capacity and keeping down gas costs. The portion of the pipeline in the vicinity of Sherwood is anticipated to begin construction in March, 2004[3]. It will be tunneled 80 feet (on average) deep, primarily along public right-of-way (ROW). Where it is not located within public ROW, private easements will be purchased. Due to the depth of the pipeline, no roadway projects should be affected.

Air

There are no designated airports or heliports in the Sherwood TSP study area

Water

There are no navigable waterways in the Sherwood TSP study area.

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[2] Per e-mail from Charles Kettenring, Assistant Vice President Engineering, P&W Railroad, Inc., 12/09/03.

[3] Per telephone conversation with Roy Rodgers, NW Natural, 12/11/03.

10. Financing & Implementation

This chapter outlines the funding sources that 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.

Current Funding Strategies

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 City of Sherwood utilizes a number of mechanisms to fund construction of its transportation infrastructure as described below. The first three sources collect revenue each year that is used to repair street facilities or construct new streets, with some restrictions on the type and location of projects. The last three programs are different in that they do not generate on-going revenue, but are a means to acquire needed property (Exaction) as development occurs, finance new streets within the downtown area (Urban Renewal District), or negotiate construction of capacity improvements on behalf of the city where land use intensity is over 43 trips per acre (99W CAP).

State Apportionment

The State of Oregon Highway Trust Fund collects various taxes and fees on fuel, vehicle licenses, and permits. A portion is paid to cities annually on a per capita basis. Sherwood's revenue has increased about $70,000 annually over the last three years, with 2004-05 projected at $700,000. By statute, the money may be used for any road-related purpose. Sherwood uses it for street operating needs.

Fuel Tax

A portion of the Washington County gas tax is distributed to cities. Sherwood gets about $62,000 per year, which is used for operating needs.

Oregon gas taxes are collected as a fixed amount per gallon of gasoline served. Gas tax in Oregon has not increased since 1992 (currently 24 cents per gallon), and this tax does not vary with changes in gasoline prices. There is no adjustment for inflation tied to the gas tax, so the lack of change since 1992 means that the net revenue collected has gradually eroded over time as the cost to construct and repair transport systems increase. Fuel efficiency in new vehicles has further reduced the total dollars collected through this system.

Sherwood gets about $725,000 per year in gas tax revenue (about $663,000 from the state and $62,000 from the County. This money is primarily spent on surface restoration of local streets.

Minor Collector System Development Charge (MCSDC)

The City passed the MCSDC into law in 1992 to fund expansion of a few specific "minor collectors" in Sherwood. The list to be funded includes a small number of streets on Washington Hill, south of downtown. Arterials, major collectors, minor collectors in other areas of the city, mass transit, and bike/pedestrian expansion projects are funded by other means per City law. The cost per average daily trip (ADT) is $25.30 and the City receives about $359,000 annually from this fund. To date, $1.1 million has been collected for minor collector development and just $170,000 has been spent.

Washington County Traffic Impact Fee

The County Traffic Impact Fee (TIF) is a tax on new development, approved by voters in 1990. The tax is levied on all new development based upon the amount of traffic added by the development, and pays for a portion of the new infrastructure needed to serve growth. TIF monies collected for development within incorporated cities are distributed back to those cities for their use on local street projects. There are limitations to the type of street projects that can be funded by TIF monies, and all projects must be approved by the Washington County Coordinating Council, which consists of city and county staff representatives.

The TIF includes automatic annual increases of 6% unless the Board of County Commissioners takes explicit action to change that year's increase. Currently, the City receives about $657,000 per year from this fund. The TIF charge for a typical single-family house in Sherwood is $253 per daily trip, or about $2,400 each. This is about average compared to other communities in the Portland-Vancouver metropolitan area, which have TIF programs that range from a low of $1,500 to over $5,000 per household.

The TIF was approved by voters as a tax and as such is not limited by existing state statute in terms of how it is calculated or applied though it does generally conform to statutory SDC requirements. Both the TIF cost basis and the allocation of TIF revenues is important as the City must not double collect. That is, if the City were to create a more wide reaching SDC that collected for all transportation systems, and then TIF revenues were applied to some of the projects included in calculating the SDC, the City would effectively be double collecting on a fraction of the SDC.

Therefore, the TIF provides certain challenges to the City implementing an SDC used to fund something more than minor collectors. In looking towards the calculation of the SDC, an allowance will need to be made for expected TIF funded projects that will impact Sherwood directly.

99W Capacity Allocation Program (CAP)

The 99W CAP was designed to manage congestion on Highway 99W. The program requires new construction on 99W to get a trip allocation certificate, specifying the expected trip generation at the site, before filing for a development certificate. The trip allocation certificate (TAC) is secured by performing a trip analysis. Exceptions exist for certain types of development including residential development, churches, schools and projects in the downtown area. Each affected project development requires an individual analysis.

New developments may generate only 43 trips per developed acre. Developments that generate more trips than that are allowed but must provide a mitigation plan to assure that the level of service on 99W is not impacted by the new development. The mitigation is derived by negotiation between the City and the developer. Mitigation may include right-of-way dedication, construction of facilities, and/or other improvements that replace the trip capacity used by the new development.

Under the 99W CAP each new development is handled independently rather than formulaically. This leads to additional administrative costs.

While the 99W CAP has been effective at requiring improvements along 99W thus far, it appears to serve as a quasi-SDC program that is not set-up with a broad planning perspective. It solves traffic needs using a "one at a time" approach that is not necessarily coordinated or comprehensive. The dollars being allocated to each individual mitigation project might be more effectively used for a single large project rather than multiple "small" projects.

The original 99W CAP program identified a list of intersection improvements including traffic signals, new turning lanes, and extensions of existing turn lanes to provide adequate long-term capacity. Most of these improvements have been completed to date. Recent development applications have been conditioned to make improvement other than the original list, including the widening of Tualatin-Sherwood Road between Highway 99W and Adams Street. The value of improvements constructed under this program is not readily available from permit records kept by the city.

Urban Renewal District

The Urban Renewal District (URD), authorized in ORS 457, is a tax-funded district within the City. The URD was formed in 2000 following an extensive public process. The URD is funded with the incremental increases in property taxes that result from construction of applicable improvements. This type of tax increment financing has been used in Oregon since 1960. Uses of the funding include, but are not limited to, transportation. Total projected transportation funding over the life of the district is $17.5 million. Approximately $16.5 million of the tax increment financing is assumed in selected street improvement projects identified in the URD and TSP.

Limitations of the District are geographic in nature with the URD covering about 15% of the City. Because of the funding mechanism and its resulting cash flow over time, the City has made use of debt capacity in order to construct needed facilities.

This program was created under specific state law following a public process. It is tax-increment funded rather than fee funded and the URD provides for renewal that includes, but is not limited to, transportation projects.

Given the purposes of the URD, its funding mechanism, and the effectiveness of the approach, there is no reason to abandon this approach. However, the transportation projects financed via this method should be carefully identified or separated from the general transportation CIP to assure there is no redundancy.

Exactions

These are improvements that are obtained when development is permitted. Developers are required to improve their frontage and, in some cases, provide off site improvements depending upon their level of traffic generation and the impact to the transportation system.

Under the above funding programs, the City of Sherwood collects approximately $1.7 million for street construction and repair, with the previously noted restrictions. Table 10-1 summarizes the current funding sources including recent annual revenues, and any unallocated balances or available funds, as applies to the URD.

Table 10-1: Summary of Current Funding Sources Used for Transportation

Funding Category	Annual Revenue	Estimated 2004 Balance or Available Funding
State Fuel Apportionment & County Gas Tax	$725,000	—
MCSDC	$359,000	$930,000
County Traffic Impact Fee	$657,000	$4,395,472
99W Capacity Allocation Program	Not available	Not available
Urban Renewal District	—	$17,500,000
Total	$1,741,000	

Additional construction may be facilitated through project-by-project negotiation using the 99W CAP program, such as frontage improvements from development exaction. However, specific estimates of the amounts from these two programs are not readily available. Furthermore, the 99W CAP construction generally is limited to Highway 99W or approaches to that highway, and they would not be applicable to other projects identified within this transportation system plan. Project construction is expected to begin in the summer of 2005. Approximately $16.5 million of the URD funding is assumed in selected street improvement projects identified in the TSP.

Projects and Programs

This section presents the recommended projects and programs developed for the City of Sherwood to serve local travel for the coming 20 years. The Pedestrian, Bicycle and Motor Vehicle projects were identified in the Action Plan for each mode, and represent those projects that have the highest short-term need for implementation to satisfy performance standards, or other policies established for the Sherwood Transportation System Plan. The costs for the remaining motor vehicle projects noted in the Motor Vehicle Master Plan are identified, but these have not been included in the funding needs analysis for the city because the Action Plan is limited to project most likely to be funded within the planning horizon. Other projects on the Master Plan list require additional funding, and they are expected to be built beyond the 20 year horizon.

The costs outlined in the Transportation System Plan to implement the Action Plans for Streets, Bicycles, Pedestrians total $46.5 million, and several other recommended transportation operations and maintenance programs would add $17.7 million for a total cost of $64.2 million. The following sections outline several methods for increasing transportation funding or seeking alternative solutions to better balance transportation costs and revenue.

Table 10-2: Sherwood Transportation Action Plans Costs over 20 years (2004 Dollars)

Transportation Element	Approximate Cost ($1,000)
System Improvement Projects (Action Plans to be funded by City)	
Motor Vehicle	$36,900
Bicycle	$2,500
Off-Street Multi-Use Paths and Trails	$4,800
Pedestrian	$2,370
Total Capital Projects	**$46,500**
Operations and Maintenance Programs and Services	
Road Maintenance ($725,000 per year)	$14,500
Pedestrian/School Safety Program ($10,000/yr)	$200
Sidewalk Grant Program ($50,000/yr)	$1,000
Neighborhood Traffic Management ($75,000/yr)	$1,500
Transportation System Plan Support Documents (i.e. Public Works Design standard update, TSP updates)	$500
Total Operations and Maintenance Programs	**$17,700**
20 YEAR TOTAL in 2004 Dollars	**$64,200**

Project Cost Estimates

Cost estimates (general, order of magnitude) were developed for the projects identified in the motor vehicle, bicycle and pedestrian elements. Cost estimates from the existing RTP, County and/or city projects in Sherwood were used in this study, if available. Other projects were estimated using general unit costs for transportation improvements, but do not reflect the unique project elements that can significantly add to project costs[1]. 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.

All cost estimates are based on 2004 dollars. Historical construction costs price index has increased by 2.5 to 2.75 percent per year according to Engineering News Record research[2] . Since 1979, construction costs have increased 100 percent in 20 years.

[1] General plan level cost estimates do not reflect specific project construction costs, but represent an average estimate. Further preliminary engineering evaluation is required to determine impacts to right-of-way, environmental mitigation and/or utilities. Experience has shown that individual projects costs can increase by 25 to 75 percent as a result of the above factors.

[2] Engineering News Record Construction Cost Index as reported for the past ten years for 20 cities around the United States. Reference: http://www.enr.com/features/conEco/costIndexes/constIndexHist.asp

Non-Motorized Vehicle Facility Projects

About $10 million in project improvements are expected for the city's pedestrian, bicycle and trail systems, which includes roughly 15 miles worth of new facilities. Most of the identified bike facility projects will occur through frontage improvement paid by re-development or by scheduled capital improvement projects since they require major roadway widening and/or relocation of on-street parking. Three on-street bike lane projects are shown, with a total estimated cost of $2.5 million. The remaining $4.8 million, or about two thirds of the Bicycle Action Plan costs, are attributed to off-street multi-use trails and pathways.

Table 10-3 outlines potential bicycle projects in Sherwood. The City, through its Capital Improvement Program (CIP) and bond measure funding (along with joint funding with other agencies such as ODOT or development approval) would implement these projects. 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 10-3: Bicycle Action Plan Projects

Street	From	To	Cost ($1,000)	Length (ft)
On Street Bike Lanes				
Murdock Road	Urban Growth Boundary	Oregon Street	1,050	5,600
Meinecke Road	Highway 99W	1st Street	950	5,000
Pine Street	1st Street	Off street trail	500	2,500
		Subtotal	**$2,500**	**13,100**
Off Street Bike Facilities / Trails				
	Roy Rodgers	Meinecke Road	964	11,500
	Villa Road	1st Street	61	650
	99W	1st Street	312	6,600
	Urban Growth Boundary	Roy Rodgers Road	496	4,100
	Urban Growth Boundary	Tualatin-Sherwood Road	421	3,300
	Tualatin-Sherwood Road	Sherwood Boulevard	430	4,600
	Sherwood Boulevard	Adams Street	159	1,700
	Tualatin-Sherwood Road	Urban Growth Boundary	449	4,800
	Highway 99W	Woodhaven Drive	93	1,000
	Steller Drive	Sunset Boulevard	149	1,600
	Sunset Boulevard	Saint Charles Way	140	1,500
	Saint Charles Way	Villa Road	112	1,200
	Ladd Hill Road	Existing Trail	41	450
	Sunset Road	Inkster Drive	327	3,500
	Highway 99W	Redfern Drive	730	7,800
		Subtotal	**$4,800**	**55,300**
Total			**$7,300**	**68,400**

Table 10-4 outlines the recommended pedestrian projects in Sherwood, which included about 7 miles of new or improved pedestrian facilities. The City, through its Capital Improvement Program (CIP) and bond measure funding (along with joint funding with other agencies such as ODOT, Washington County or development approval) would implement these projects.

Table 10-4: Pedestrian Action Plan Projects

Street	Side	From	To	Cost ($1,000)	Length (feet)
12th Street	South	Hwy 99W	Sherwood Boulevard	70	1,300
Borchers Drive	North	Borchers Drive	Houston Drive	64	-
Century Drive	North	Baler Way	Adams Avenue	64	1,200
Division Street	Both	Sherwood Boulevard	Cuthill Place	327	3,000
Edy Road	South	Hwy 99W	Terrapin Drive	125	2,300
Edy Road	North	Borchers Drive	Houston Drive	33	600
Elwert Road	East	Hwy 99W	Orchard Hill Lane	70	1,300
Hwy 99W	East	UGB	Sunset Boulevard	152	2,800
Hwy 99W	East	12th Street	Sherwood Boulevard	35	650
Hwy 99W	East	Sherwood Boulevard	Tualatin-Sherwood Rd	29	550
Hwy 99W	West	12th Street	Sherwood Boulevard	60	1,100
Hwy 99W	West	Sherwood Boulevard	Tualatin-Sherwood Rd	46	850
Hwy 99W	West	Tualatin-Sherwood Rd	North	55	1,000
Main Street	North	2nd Street	3rd Street	17	300
Meinecke Road	North	3rd Street	Lee Drive	82	1,500
Murdock Road	East	City Limits	Division Street	92	1,700
Oregon Street	North	Murdock Street	Ash Street	109	2,000
Pacific Highway	Both	UGB	Timbrel Lane	164	1,500
Pine Street	Both	Division Street	Railroad	142	1,300
Pine Street	East	Division Street	Sunset Boulevard	65	1,200
Pine Street	East	Oregon Street	Railroad	11	200
Roy Street	North	Murdock Road	Cochran Drive	33	600
Sherwood Boulevard	West	Willow Drive	UGB	44	800
Sunset Boulevard	North	Pine Street	Aldergrove	41	750
Sunset Boulevard	North	Saint Charles Way	Redfern Drive	41	750
Sunset Boulevard	South	Greengate Way	West	38	700
Sunset Boulevard	North	Greengate Way	West	17	300
Timbrel Lane	North	Pacific Highway	Middleton Road	42	750
Washington Street	Both	Division Street	Tualatin Street	50	450
Washington Street	Both	Columbia Street	Oregon Street	38	350
Washington Street	Both	2nd Street	South	22	200
Willamette Street	South	Roy Street	Division Street	191	3,500
Total				**$2,370**	**38,000**

Motor Vehicle Projects

The Motor Vehicle Action Plan projects reported in Chapter 8 are summarized in Table 10-5. These include street extensions, re-alignments, traffic signals, and other recommended improvements to the city street system. The full scope and estimated costs for these projects require further study, and not all of these projects have identified funding.

The total city street projects included in the Action Plan represent $74.1 million dollars over the next 20 years. The portion of that total to be funded by the City is $36.9, which includes $16.5 million from the Urban Renewal District in the Downtown area. The remaining $20.4 million does not have specific funding programs identified from existing or new City funding programs. Local developmental projects within the city are expected to fund an additional $9.3 million dollars of projects, and the County, Region and State are expected to contribute the remaining $27.9 million through the Metropolitan Transportation Improvement Program (MTIP), Major Street Improvement Program (MSTIP) or other non-city sources.

Table 10-5: Other Motor Vehicle Project Costs for All Funding Sources

Funding Source	Estimated Cost (Million Dollars)
Unfunded City Action Plan Costs	$20.4
Urban Renewal District	$16.5
Development Related	$9.3
County, Regional or State (MTIP, MSTIP, etc.)	$27.9
Total (City, Development, Other)	**$74.1**

Other Transportation Programs and Services

In addition to the physical system improvements identified in the previous section, the transportation facilities will require on-going operation and maintenance improvements across a variety of areas. These other transportation programs are recommended to respond to the specific policies and needs in maintaining roadway pavement quality, supporting safe routes to schools programs, allocations for implementing neighborhood traffic management, and on-going update and support of related planning documents.

Roadway Maintenance

The city does not have a Pavement Management System to aid in making forecasts for roadway patching, re-surfacing and reconstruction, but the a nominal average cost from similar communities is $14,000 per lane mile. The annual cost was estimated at $725,000, a portion of which is likely paid for by gas tax revenues from the state. Over 20 years, this accounts for $14.5 million for on-going roadway maintenance, which is the second highest cost component of the transportation plan. The actual maintenance costs could vary from this estimate.

Neighborhood Traffic Management (NTM)

Specific NTM projects are not defined. These projects will be subject to neighborhood consensus based upon City placement and design criteria. A city NTM program, if desired, should be developed with criteria and policies 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 mitigation of traffic impacts. Annual allocation of $75,000 is identified for the program development, and implementation of NTM projects.

School Safety Program

Each school within the city should be evaluated to review the convenience and safety of connections for pedestrians and bicycle travel from the neighborhoods that they serve. A "Safe Route to School" plan identifies key routes for pedestrian and bike circulation around the schools, and suggests needed improvements to traffic controls, crossing management, and on-site circulation that would improve safety for school-aged children. An annual allocation of $10,000 is set aside for this purpose.

Transportation System Plan Support Documents

The adopted transportation system plan requires a series of implementing and on-going update steps to retain its usefulness over the next 20 years. This includes refining and updating the affected Public Works Design standards for streets and trails, implementing the suggested development code and Comprehensive Plan text changes, and periodic updates and reviews of forecasts and project priorities. The State suggested that a city should update their TSP every five years to keep current on the latest land development trends, capital project funding conditions, and priorities of the community.

New Funding Sources and Opportunities

The new transportation improvement projects and recommended programs will require funding beyond the levels currently collected by the City. There are several potential funding sources for transportation improvements. This section summarizes several funding options available for transportation improvements. These are sources that 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.

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 include 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.

Transportation program funding options range from local taxes, assessments, and charges to state and federal appropriations, grants, and loans. All of these resources can be constrained based on a variety of factors, including the willingness of local leadership and the electorate to burden citizens and businesses; the availability of local funds to be dedicated or diverted to transportation issues from other competing City programs; and the availability and competitiveness of state and federal funds. Nonetheless, it is important for the City to consider all of its options and understand where its power may exist to provide and enhance funding for its Transportation programs.

The following funding sources have been used by cities to fund the capital and maintenance aspects of their transportation programs. There may be means to begin to or further utilize these sources, as described below, to address new needs identified in the Transportation System Plan.

- **General Fund Revenues**: At the discretion of the City Council, the City can allocate General Fund revenues to pay for its Transportation program. (General Fund revenues primarily include property, use taxes, and any other miscellaneous taxes and fees imposed by the City.) This allocation is completed as a part of the City's annual budget process, but the funding potential of this approach is constrained by competing community priorities set by the City Council. General Fund resources can fund any aspect of the program, from capital improvements to operations, maintenance, and administration. Additional revenues available from this source to fund new aspects of the Transportation program are only available to the extent that either General Fund revenues are increased or City Council directs and diverts funding from other City programs.

- **Voter-Approved Local Gas Tax**: Communities such as Sandy, Woodburn, and Tillamook have adopted local gas taxes by public vote. In Sandy, the tax is 1 cent per gallon, paid to the city monthly by distributors of fuel. The process for presenting such a tax to voters will need to be consistent with Oregon State law as well as the laws of the City of Sherwood.

- **Street Utility Fee Revenue**: A number of Oregon Cities supplement their street funds with street utility fees. Establishing user fees to fund applicable transportation activities and/or capital construction ensures that those who create the demand for service pay for it proportionate to their use. From a system health perspective, forming a utility also helps to support the ongoing viability of the program by establishing a source of reliable, dedicated funding for that specific function. Fee revenues can be used to secure revenue bond debt used to finance capital construction. A street utility can be formed by Council action and does not require a public vote.

- **A single unified System Development Charge** – The SDC would be used as a funding source for all capacity adding projects for the transportation system as well as provide a capital recovery element to compensate for existing capacity paid for by current users. It would replace the existing MCSDC and 99W CAP program and expand the reach into a more generalized format not restricted by geography or specific street purpose but instead would serve all transportation needs ranging from arterials to mass transit and alternative transportation. The SDC should be based on afternoon peak-hour trips rather than the average daily trips currently used for the MCSDC, and should apply to all types of new development (e.g., commercial and residential).

- **Local Improvement District Assessment Revenue**: Subject to voter approval, the City may set up Local Improvement Districts (LIDs) to fund specific capital improvement projects within defined geographic areas, or zones of benefit. LIDs impose assessments on properties within its boundaries. LIDs may not fund ongoing maintenance costs. They require separate accounting, and the assessments collected may only be spent on capital projects within the geographic area. A vote by citizens representing 33% of the assessment can terminate a LID and overturn the planned projects so projects and costs of a LID must meet with broad approval of those within the boundaries of the LID.

- **TEA-21 Grant Revenue**: The Transportation Equity Act for the 21st Century, a federal program, provides for funding of surface transportation programs through grants with local matching. Funds are allocated to the states for distribution to capital projects at the local level. As with all special assistance programs provided by the state and federal governments, funding for specific projects is highly competitive; however these funds may be available for improvements identified in the Transportation Plan.

- **TGM Grant Program**: The State of Oregon TGM Grant Program provides grants for Transportation System Planning Projects. Under Category 1 of the program, projects can include system modeling to determine needs, planning for arterials and collectors, bike and pedestrian plans and public transportation plans. Category 2 includes grants for integrated land use and transportation planning projects. This includes corridor plans, specific development plans, and redevelopment plans for urban redevelopment districts.

- **Direct Appropriations**: The City can seek direct appropriations from the State Legislature and / or U.S. Congress for transportation capital improvements. There may be projects identified in the Plan for which the City may want to pursue these special, one-time appropriations.

- **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 addition to property tax.
- **Employment Taxes**: TriMet collects a tax for transit operations in the Portland region through payroll and self employment taxes. Approximately $145 million are collected annually in the Portland region for transit.

Also, while not direct funding sources, debt financing can be used to mitigate the immediate impacts of significant capital improvement projects and spread costs over the useful life of a project. Though interest costs are incurred, the use of debt financing can serve not only as a practical means of funding major improvements, but is also viewed as an equitable funding strategy, spreading the burden of repayment over existing and future customers who will benefit from the projects. The obvious caution in relying on debt service is that a funding source must still be identified to fulfill annual repayment obligations.

- **Voter-Approved General Obligation Bond Proceeds:** Subject to voter approval, the City can issue General Obligation (G.O.) bonds to debt finance capital improvement projects. G.O. bonds are backed by the increased taxing authority of the City, and the annual principal and interest repayment is funded through a new, voter-approved assessment on property City-wide (a property tax increase). Depending on the critical nature of any projects identified in the Transportation Plan, and the willingness of the electorate to accept increased taxation for transportation improvements, voter-approved G.O. bonds may be a feasible funding option for specific projects. Proceeds may not be used for ongoing maintenance.
- **Revenue Bonds:** Revenue bonds are debt instruments secured by rate revenue. In order for the City to issue revenue bonds for transportation projects, it would need to identify a stable source of ongoing rate funding. Interest costs for revenue bonds are slightly higher than for general obligation bonds, due to the perceived stability offered by the "full faith and credit" of a jurisdiction.

It is recommended that the City consider establishing a transportation, or street, utility as the backbone of its capital funding approach. Street utility fees can provide a stable source of dedicated revenue useable for transportation system operations and maintenance and / or capital construction. Rate revenues can also secure revenue bond debt if used to finance capital improvements. Street utilities can be formed by Council action, and billed through the City utility billing system. In addition, the City should actively pursue grant and other special program funding in order to mitigate the costs to its citizens of transportation capital construction.

System Development Charge Analysis

Oregon Revised Statute (ORS) 223.297 - 223.314 defines SDCs and specifies how they shall be calculated, applied, and accounted for. By statute, an SDC is either of or the sum of the following two components:

a **reimbursement fee**, designed to recover costs associated with capital improvements *already constructed or under construction*, and an **improvement fee**, designed to recover costs associated with capital improvements *to be constructed in the future.*

The reimbursement fee methodology must consider such things as the cost of existing facilities and the value of unused capacity in those facilities. The calculation must also ensure that future system users contribute no more than their fair share of existing facilities costs. Reimbursement fee proceeds may be spent on any capital improvements related to the systems for which the SDC applied. Transportation SDCs must be spent on transportation improvements.

The improvement fee methodology must include only the cost of projected capital improvements needed to increase system capacity for growth. In other words, the cost(s) of planned projects that correct existing deficiencies, or do not otherwise increase capacity, may not be included in the improvement fee calculation. Improvement fee proceeds may be spent only on capital improvements, or portions thereof, which increase the capacity of the systems for which they were applied.

In general, an SDC is calculated by adding the applicable reimbursement fee component to the applicable improvement fee component. Each separate component is calculated by dividing the eligible cost by the appropriate measure of growth in capacity. The unit of capacity used becomes the basis of the charge. A sample calculation is shown below where Peak Hour Trips ("PHTs") are used.

$$\underbrace{\frac{\text{Eligible cost of capacity in existing facilities}}{\text{Growth in PHTs}}}_{\boxed{\textbf{Reimbursement Fee}}} + \underbrace{\frac{\text{Eligible cost of planned capacity-increasing capital improvements}}{\text{Growth in PHTs}}}_{\boxed{\textbf{Improvement Fee}}} = \underbrace{\text{SDC (\$ / PHT)}}_{\boxed{\textbf{SDC}}}$$

The calculation of the proposed SDC is summarized below.

<u>Capacity Basis</u>
It is estimated that the existing transportation system in the City of Sherwood supports 10,900 peak-hour trips. At buildout, the system is projected to support 16,900 peak-hour trips. The projects in the Plan will provide the capacity needed by this projected growth of 6,000 peak-hour trips. In the absence of project-specific capacity estimates, it is reasonable to assume that the project list as a whole will provide capacity for growth proportional to the growth in demand. That is to say, at buildout capacity of 16,900 peak-hour trips, 6,000 peak-hour trips, or 35.5% of system capacity, will be attributable to growth now yet to occur. It is reasonable to allocate 35.5% of each project to growth on that basis.

<u>Reimbursement Fee Calculation</u>
We do not recommend that the City adopt a reimbursement fee for the transportation service, because we could not reasonably identify a valid cost basis. More specifically, there are two reasons for this determination. First, the City does not have asset cost records for the transportation infrastructure. Second, construction of the transportation system has been funded through gas tax revenues and a variety of other general tax sources. It would be very difficult, if not impossible, to argue that the owner of a developing property had not already paid for a share of the transportation system through these general taxes.

In the future, with adequate asset records showing facilities that have been funded by SDC receipts, it will be possible to establish a reimbursement fee cost basis. The model has been constructed to allow for such a calculation.

Improvement Fee Calculation

The following approach was taken to determine the cost of capacity-increasing capital improvements, the numerator in the improvement fee calculation, and calculate the fee.

- City staff and DKS Associates compiled a list of needed capital projects for the Transportation System Plan. The sum of this list of project costs was $74,125.
- The project team then deducted projected funding from other sources, primarily the URD, leaving a "City share" of $57,675,000. Projects to be funded by the County TIF have not yet been explicitly identified, so this adjustment will be applied later to ensure no double charging.
- The project team then allocated 35.5% of the cost of each capacity-increasing project to the improvement fee cost basis. The sum of this list of capacity-increasing project costs, the gross improvement fee cost basis, was $20,476,331.
- Next, the current transportation MCSDC fund balance, and the current County TIF fund balance were deducted from the gross improvement fee cost basis to (1) recognize that those fund balances are available for spending on the project list and (2) prevent new customers from paying for those project costs twice. This result, $15,150,859, was the improvement fee cost basis.
- The improvement fee was then calculated as the improvement fee cost basis divided by growth in PHTs as an estimate of forecasted growth in system capacity. The result of this calculation was an improvement fee of $2,577 per peak-hour trip.

Recommended System Development Charge

The recommended transportation SDC is the sum of the reimbursement fee ($0 as recommended in this section) and the improvement fee, adjusted by an administrative cost recovery factor of 2.11%. The administrative cost recovery factor was derived by dividing estimated annual SDC program accounting and administrative costs, including the amortized cost of this study, by forecasted annual transportation SDC revenues.

The SDC calculation is summarized below.

System Development Charge Calculation Summary

I. Reimbursement Fee Cost Basis		
Cost of Unused Capacity	$	-
less: Outstanding Debt Principal		-
less: Contributions in aid of Construction (CIAC)		-
Net Allocable Plant-in-Service	$	-
Net Existing Plant-in-Service Allocable to Growth	$	-
II. Improvement Fee Cost Basis		
Project List Total	$	74,125,000
less: Other Funding Sources		16,450,000
Subtotal		57,675,000
less: Improvements Allocable to Existing Customers		37,198,669
less: Existing TIF and MCSDC Fund Balances		5,325,472
Net Capital Improvement Costs Allocable to Growth	$	15,150,859
III. Capacity Analysis		
Existing Customer Base (Peak-Hour Trips)		10,900
Maximum Customer Base (Peak-Hour Trips)		16,900
Growth's Share as Percentage of Build-out		35.5%
IV. Fee Calculation		
Transportation Reimbursement Fee (per P-H T)	$	-
Transportation Improvement Fee (per P-H T)	$	2,525
SDC Subtotal (per P-H T)	$	2,525
Administrative Fee 2.04% (per P-H T)	$	52
Total SDC per Peak-Hour Trip:	**$**	**2,577**

A developing "typical" single family residence would pay a transportation SDC of $2,577 under this approach.

County TIF Adjustment

It is our understanding from discussions with City staff and County staff, and our review of the TIF code language, that TIF receipts are to be spent only on capacity-increasing transportation system improvements. To the extent that there is or could be duplication in the project costs collected for, the City will need to make an explicit adjustment for the TIF to prevent double charging. The County reported that it does not have a list of TIF-eligible projects in Sherwood – it simply assesses the TIF and remits the proceeds to the City. Therefore, TIF revenues will be available for funding the same projects that form the basis for the City SDC. It is our recommendation that the City credit individual TIF charges against the City SDC in order to prevent this duplication. The net City SDC charged to development would be as illustrated in Table 10-6 below:

Table 10-6: Examples of City Transportation SDC Charge

Description	Amount for One Single-Family Detached House	Amounts per 1,000 Square Feet of Discount Super Store
City SDC per Peak Hour Trip times standard trips per unit	$2,577	$6,667
County TIF	$2,578	$3,193
Net Payable to City Transportation SDC Fund	$0	$3,474

For the residential example, the net fee collected by the city is zero because the county fee is slightly higher than the city fee. However, the TIF charge for the discount super store retail use is $3,193 per 1,000 square foot, which is significantly less than the city rate, $6,667,so the collected amount is $3,474. For a typical 200,000 square foot super store, the SDC fee to the city would be $694,800. Similar difference would be calculate for all other typical land use categories in the city, and the net fee due compared to the latest Washington County TIF rate would be shown.

APPENDIX

Level of Service Description

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 intersections 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. Level 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.[1] The following three sections provide interpretations of the analysis approaches.

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[1] *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2000, Chapters 16 and 17.

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 calculates a delay value for each approach to the intersection. The *2000 Highway Capacity Manual* describes the detailed methodology. The following table describes the amount of delay associated with each level of service.

Delay (Seconds)	Level of Service
0 - 10	A
10 - 15	B
15 - 25	C
25 - 35	D
35 - 50	E
> 50	F

Source: 2000 *Highway Capacity Manual*, Transportation Research Board, Washington, D.C.

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 *2000 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.

Level of Service	Expected Delay	(Sec/Veh)
A	Little or no delay	0-10.0
B	Short traffic delay	>10.1-15.0
C	Average traffic delays	>15.1-25.0
D	Long traffic delays	>25.1-35.0
E	Very long traffic delays	>35.1-50.0
F	Extreme delays potentially affecting other traffic movements in the intersection	> 50

Source: 2000 *Highway Capacity Manual*, Transportation Research Board Washington, D.C.

SIGNALIZED INTERSECTIONS

For signalized intersections, level of service is evaluated based upon average vehicle delay experienced by vehicles entering an intersection. Control delay (or signal delay) includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In previous versions of this chapter of the HCM (1994 and earlier), delay included only stopped delay. As delay increases, the level of service decreases. Calculations for signalized and unsignalized intersections are different due to the variation in traffic control. The *2000 Highway Capacity Manual* provides the basis for these calculations.

Level of Service	Delay (secs.)	Description
A	≤10.00	**Free Flow/Insignificant Delays:** No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Most vehicles do not stop at all. Progression is extremely favorable and most vehicles arrive during the green phase.
B	10.1-20.0	**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	20.1-35.0	**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	35.1-55.0	**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	55.1-80.0	**Unstable Operation/Significant Delays:** Volumes at or near capacity. Vehicles may wait though 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	≥80.0	**Forced Flow/Excessive Delays:** Represents jammed conditions. Queues may block upstream intersections. This level occurs when arrival flow rates exceed intersection capacity, and is 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: *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C.

ARTERIAL LEVEL OF SERVICE

Arterial level of service is based on the average travel speed for the segment, section, or entire arterial under consideration. The average travel speed is computed from the running time on the arterial segment(s) and the intersection approach delay. It is strongly influenced by the number of signals per mile and the average intersection delay. On a given facility, factors such as inappropriate signal timing, poor progression, and increasing traffic flow can substantially degrade the arterial LOS.[2]

Arterial levels of service are summarized in the following table.

Arterial Levels of Service

Arterial Class	**I**	**II**	**III**
Range of Free Flow Speeds (mph)	45 to 35	35 to 30	35 to 25
Typical Free Flow Speed (mph)	40 mph	33 mph	27 mph
Level of Service	**Average Travel Speed (mph)**		
A	35	30	25
B	28	24	19
C	22	18	13
D	17	14	9
E	13	10	7
F	< 13	< 10	< 7

2 *1994 Highway Capacity Manual*, Special Report 209, Transportation Research Board, Washington D.C., 1994, Chapter 11.

The three arterial classes (I, II, and III) used to find the appropriate level of service are based on design and functional characteristics shown in the table below.

Definition of functional categories

Functional Category	Characteristics
Principal Arterial	• Mobility very important • Heavily restricted access • Connected to freeways, important activity centers, major traffic generators • Relatively long trips between above points and through trips entering, leaving,and going through the city.
Minor Arterial	• Mobility important • Substantially restricted access • Connected to principal arterials • Trips of moderate lengths within relatively small geographical area

Design Category	Characteristics
Suburban	• Low access density • Multilane divided; undivided or two-lane with shoulders arterial • No parking • Separate left turn lanes • 1 to 5 signals per mile • 40 to 45 mph speed limits • Little Pedestrian activity • Low to medium roadside development density
Intermediate	• Moderate access density • Multilane divided or undivided; one way or two lane arterial • Some parking • Usually separate left turn lanes • 4 to 10 signals per mile • 30 to 40 mph speed limits • Some pedestrian activity • Medium to moderate roadside development density
Urban	• High access density • Undivided one way; two way, two or more lanes arterial • Much parking • Some separate left-turn lanes • 6 to 12 signals per mile • 25 to 35 mph speed limits • Usually pedestrian activity • High density roadside development

Once the arterial is classified using the functional and design categories, the table below can be used to find the associated arterial class.

Arterial Class According to Design and Functional Categories

	FUNCTIONAL CATEGORY	
DESIGN CATEGORY	PRINCIPAL ARTERIAL	MINOR ARTERIAL
TYPICAL SUBURBAN	I	II
INTERMEDIATE	II	II OR III
TYPICAL URBAN	II OR III	III

Glossary

COMMON TERMS

Access Management: Refers to measures regulating access to streets, roads and highways from public roads and private driveways. Measures may include but are not limited to restrictions on the type and amount of access to roadways, and use of physical controls such as signals and channelization including raised medians, to reduce impacts of approach road traffic on the main facility.

Accessway: Refers to 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.

ADT: Average Daily Traffic. This is the measurement of the average number of vehicles passing a certain point each day on a highway, road or street.

Alternative Modes: Transportation alternatives other than single-occupant automobiles such as rail, transit, bicycles and walking.

Arterial (Street): A street designated in the functional class system as providing the highest amount of connectivity and mostly uninterrupted traffic flow through an urban area.

Bicycle Facility: Any facility provided for the benefit of bicycle travel, including bikeways and parking facilities.

Bicycle Network: A system of connected bikeways that provide access to and from local and regional destinations.

Bike Lane: A portion of the roadway which has been designated by striping and pavement markings for the preferential or exclusive usr of bicyclists.

Capacity: The maximum number of vehicles or individuals that can traverse a given segment of a transportation facility with prevailing roadway and traffic conditions.

CBD: Central Business District. This is the traditional downtown area, and is usually characterized by slow traffic speeds, on street parking and a compact grid system.

Collector (Street): A street designated in the functional class system that provides connectivity between local and neighborhood streets with the arterial streets serving the urban area. Usually shorter in distance than arterails, designed with lower traffic speeds and has more traffic control devises than the arterial classification.

Congestion Mitigation/Air Quality (CMAQ): A program within the federal ISTEA and TEA-21 regulations that address congestion and transportation-related air pollution.

Crosswalk: Portion of a roadway designated for pedestrian crossing and can be either marked or unmarked. Unmarked crosswalks are the national extension of the shoulder, curb line or sidewalk.

Demand Management: Refers to actions which are designed to change travel behavior in order to improve performance of transportation facilities and to reduce need for additional road capacity. Methods may include subsidizing transit for the journey to work trip, charging for parking, starting a van or car pool system, or instituting flexible work hours.

Grade Separation: The vertical separation of conflicting travelways.

Grade: A measure of the steepness of a roadway, bikeway or walkway, usually expressed in a percentage form of the ratio between vertical rise to horizontal distance. (eg. a 5% grade means that the facility rises 5 feet in height over a 100 feet in length.)

Impervious Surfaces: Hard surfaces that do not allow water to soak into the ground, increasing the amount of stormwater running into the drainage system.

Level of Service (LOS): A qualitative measure describing the perception of operation conditions within a traffic steam by motorists and or passengers. An LOS rating of "A" to "F" describes the traffic flow on streets and at intersections, ranging from LOS A, representing virtually free flow conditions and no impedance to LOS F representing forced flow conditions and congestion.

Local (Street): A street designated in the functional class system that's primary purpose is to provide access to land use as opposed to enhancing mobility. These streets typically have low volumes and are very short in relation to collectors and arterials.

Metropolitan Planning Organization (MPO): An organization in each federally recognized urbanized area (population over 50,000) designated by the Governor which has the responsibility for planning, programming and coordinating the distribution of federal transportation resources.

Multi-Modal: Involving several modes of transportation including bus, rail, bicycle, motor vehicle etc.

Multi-Use Path: A path separated from motor vehicle traffic by open space or barrier used by bicyclists, pedestrians, joggers, skaters and other non-motorized travelers.

National Highway System (NHS): The National Highway System is interconnected urban and rural principal arterial and highways that serve major population centers, ports, airports and other major travel destinations, meet national defense requirements and serve interstate and interregional travel.

Neighborhood (Street): A street designated in the functional class system that's primary purpose is to provide access to land use, but provides more mobility than a local street. These streets typically have moderate volumes and are shorter in relation to collectors and arterials.

Peak Period or Peak Hour: The period of the day with the highest number of travelers. This is normally between 4-6 PM on weekdays.

Pedestrian Connection: A continuous, unobstructed, reasonability direct route between two points that is intended and suitable for pedestrian use. These connections could include sidewalks, walkways, accessways, stairways and pedestrian bridges.

Pedestrian District: A comprehensive plan designation or implementing land use regulation, such as an overlay zone, that establishes requirements to provide a safe and convenient pedestrian environment an area planned for a mix of uses likely to support a relatively high level of pedestrian activity.

Pedestrian Facility: A facility provided for the benefit of pedestrian travel, including walkways, crosswalks, signs, signals and benches.

Pedestrian Scale: Site and building design elements that are oriented to the pedestrian and are dimensionally less than those sites designed to accommodate automobile traffic.

Right-Of-Way (ROW): A general term denoting publicly-owned land or property upon which public facilities and infrastructure is placed.

Shared Roadway: A type of bikeway where bicyclists and motor vehicles share a travel lane.
Sight Distance: The distance a person can see along an unobstructed line of site.

Traffic Control Devices: Signs, signals or other fixtures placed on or adjacent to a travelway that regulates, warns or guides traffic. Can be either permanent or temporary.

Transportation Analysis Zone (TAZ): A geographic sub-area used to assess travel demands using a travel demand forecasting model. Often defined by the transportation network and US Census blocks.

Transportation Disadvantaged: Individuals who have difficulty obtaining transportation because of their age, income, physical or mental disability.

Transportation System Plan: Is a comprehensive plan that is developed to provide a coordinated, seamless integration of continuity between modes at the local level as well as integration with the regional transportation system.

Urban Area: The area immediately surrounding an incorporated city or rural community that is urban in character, regardless of size.

VISUAL SIMULATIONS

Visual Simulations of Proposed Street Projects

#5: Tualatin-Sherwood Road Widening

Project Notes and Related Comments:

Widen Tualatin-Sherwood Road to 5 lanes (2 thru lanes each direction) between Borchers Road on west side to Oregon Street.

Estimated Project Cost : $ 15.3 million

<u>Other Related Projects:</u>
* Construct traffic signal coordination from Borchers Road to Adams Street.
* Separate project to extend Adams Street along Target store, connect to Tualatin-Sherwood Road, and to Hwy. 99W near Home Depot.
* Langer Road re-connected to new street (Baler Street), which runs along west side of Target Store.

Visual Simulations of Proposed Street Projects

#2: Adams Street Extension from Downtown to Tualatin-Sherwood Road

Before

After

Project Notes and Related Comments:

Construct new 3-lane collector street from First Street near downtown to Tualatin-Sherwood Road

Estimated Project Cost : $5.9 million

Other Comments:
* Includes parallel pedestrian & bike path off-street along east side of roadway.
* Actual project includes street trees (omitted for clarity of image above).
* Separate Project #3 to extend Adams Street across Tualatin-Sherwood Road to Hwy. 99W near Home Depot.

Visual Simulations of Proposed Street Projects

#12: Phase One of Downtown Sherwood Streetscape Master Plan

Before

After

Project Notes and Related Comments:

Sidewalks, street trees, upgraded roadway pavement, signs and lighting treatments.

Estimated Project Cost : $10.4 million

Other Comments:
* Relocate existing rail crossing at Washington Street to Pine Street. Close Washington Street crossing.
* North of photo, Oregon Street re-aligned to keep on east side of rail road, and connects to Pine Street east of railroad.
* Pine Street extended across railroad tracks.
* New development opportunities for Civic Center and re-development of the Cannery site.

TRAFFIC CALMING TOOL BOX

Residential Traffic Calming Program Toolbox

PHASE I

Do Not Enter Sign

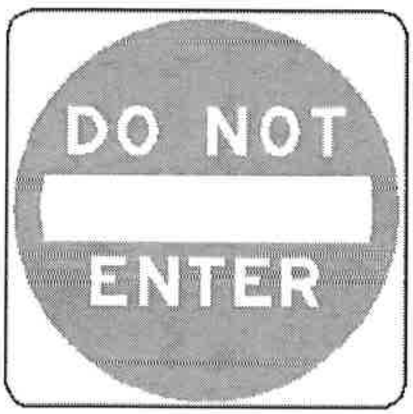
Description: Restrict access

Purpose: The purpose of a this sign is to indicate to drivers that they are not permitted to proceed straight ahead. When used as a traffic calming measure, it is intended to discourage through traffic from short-cutting along a street. The sign may be accompanied by a supplementary plate sign indicating the time(s) of the day and the days of the week when the regulation applies.

Advantages
- May result in significant reductions in traffic volumes

Disadvantages
- No significant effect on vehicle speeds.
- Restricts resident access.

Equipment Cost: $100 to $200 per sign, installed.



Neighborhood Speed Watch

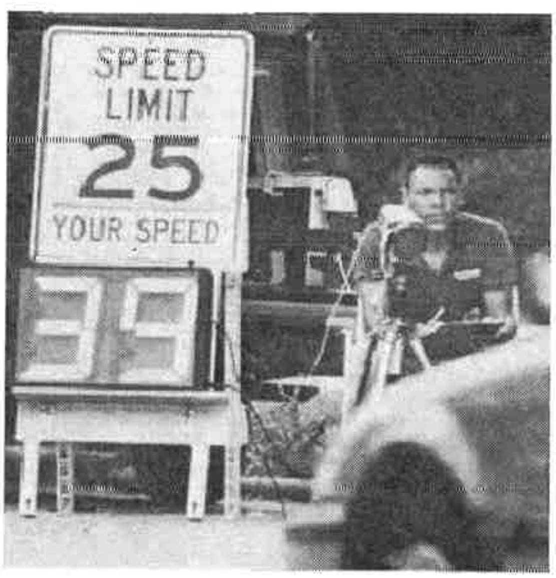
Description: Residents use radar equipment to identify speeding vehicles. The information gathered is matched with the Driver and Motor Vehicle Service (DMV) records. The City then sends a letter to the vehicle's registered owner advising the owner their vehicle was seen speeding. The letter appeals to the owner and/or driver to slow down on neighborhood streets. This program does not issue speeding tickets.

Purpose: To slow vehicle traffic, educate drivers about vehicle speeds, and allow residents to take an active part in the program.

Advantages
- Reduces speed by increasing driver awareness about speeding on residential streets and about safety.
- An effective public relations and educational tool.

Disadvantages
- Not an enforcement tool.
- Not effective in modifying long-term habits.

Cost: $500



One-Way Sign

Description: Directional movement sign.

Purpose: The purpose of a One-Way sign is to indicate to drivers that traffic is allowed to travel only in the direction of the arrow on the street or section of street. When used as a traffic calming measure, the intent of a One-Way sign is to prevent through traffic from short-cutting along a street.

Advantages
- Vehicle-vehicle and vehicle-pedestrian conflicts at intersections are reduced as there are fewer turning movements.
- Reduction in traffic volume.

Disadvantages
- Removal of traffic travelling in the opposing direction can result in an increase in vehicle speeds.
- Reduction in traffic volume may be partially offset by an increase in traffic in the remaining direction.

Cost: $100 to $200 per sign, installed.

Pavement Markings

Description: Stop bars, yield bars, turn arrows, delineators, lane markings, crosswalks, etc.

Purpose: To delineate and to transmit to motorists, bicyclists, and pedestrians important information necessary to safely travel upon the City's street.

Advantages
- Low initial cost.
- Quick application.

Disadvantages
- Maintenance cost.
- May not be visible when covered with snow.

Cost: Varies widely depending on type and amount of material used.

Police Enforcement

Description: Increased enforcement of speed limits on problem local streets.

Purpose: To reduce traffic speed and increase traffic safety.

Potential Advantages
- Visible enforcement could reduce speed by increasing driver awareness about speeding on residential streets and about safety.
- The approach is flexible and can be tailored to suit needs.
- Response can be quick and effective.

Potential Disadvantages
- Long-term benefits of speed reduction are unsubstantiated without regular periodic enforcement.
- It may be difficult to provide enforcement to the extent and with the frequency that residents desire.

Cost: $90,000 to $100,000 per year for one officer and equipment.

Speed Monitoring Trailer

Description: Portable radar speed meter capable of measuring vehicle speed and displaying the speed of the motorist.

Purpose: To slow vehicle traffic and to educate residents and drivers about vehicle speeds.

Advantages
- Speeds may be reduced during short intervals where the radar trailer is located.
- An effective public relations and educational tool.

Disadvantages
- Not an enforcement tool.
- Not effective in modifying long-term habits.
- Effect on speed limited to the vicinity of the trailer.
- Not effective on multi-lane roadways.

Cost: $8,000 - $13,000 per trailer.

Turn Prohibition

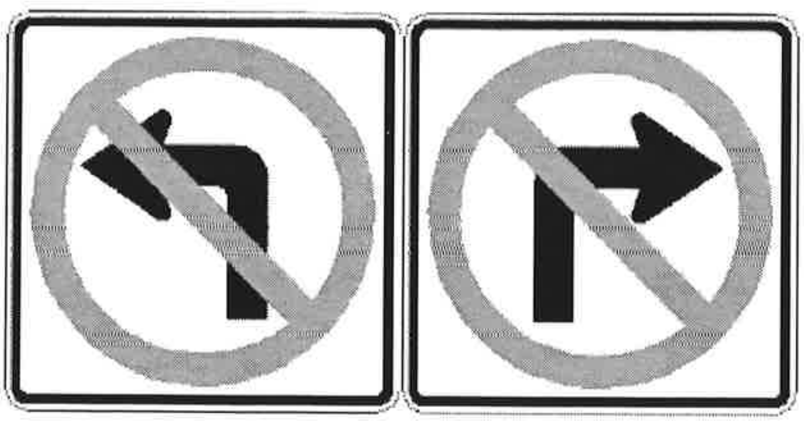
Description: Turn Prohibition sign

Purpose: The purpose of a Right (Left) Turn Prohibition sign is to indicate to drivers that they are not permitted to turn right (left). When used as a traffic calming measure, this sign is intended to prevent traffic from short-cutting along a street. The sign may be accompanied by a supplementary plate indicating the time(s) of the day and the days of the week when the regulation applies.

Advantages
- May result in significant reductions in traffic volumes where supported periodically with police enforcement.

Disadvantages
- No significant effect on vehicle speeds.
- Restricts resident access.

Cost: $100 to $200 per sign, installed.



PHASE II - HORIZONTAL DEFLECTION

Bulb-Outs

Description: The lane is narrowed at an intersection or mid-block by extending the curbs on one or both sides of the street toward the center of the roadway or by building detached raised islands to allow for drainage and bike lane passage. May be used in conjunction with striped crosswalks.

Purpose: To slow traffic at intersections and to improve pedestrian safety.

Potential Advantages
- May reduce vehicle speed.
- May reduce cut-through traffic.
- Reduces crossing distance for pedestrians.
- Minimal impact to emergency vehicles.
- Does not restrict access for residents.
- Can be designed to restrict truck entry.
- Can be aesthetically pleasing, if landscaped.

Potential Disadvantages
- Some designs can create conflicts for bicyclists (properly designed bulb-outs do not create such conflicts).
- Can impact drainage (depending on design and location).
- Curbside parking must be prohibited at the bulb, thus eliminating at least one space at each bulb location.
- Low impact on mid-block speeding.
- Maintenance responsibility, if landscaped.
- Can impede legitimate truck movements.

Cost: $3,000 -$5,000

Center Island Narrowing

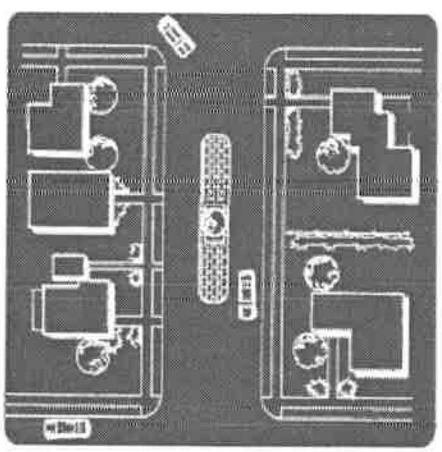
Description: Constructed or painted islands located before an intersection or mid-block along the centerline of a street.

Purpose: To reduce traffic speed by narrowing the roadway with a median, and to increase pedestrian safety by providing a refuge halfway across the street, so that only one direction of traffic need be crossed at a time.

Potential Advantages
- May reduce traffic speed.
- Improves pedestrian safety.
- Does not restrict emergency vehicle access.
- Can be aesthetically pleasing if landscaped.

Potential Disadvantages
- May divert traffic to adjacent streets without traffic calming.
- May impact parking depending on lane width.
- May eliminate the possibility of future bike lane installation on street by narrowing the travel lane.

Cost: $60 per linear foot; $7,000 to $10,000 per device



Chicanes

Description: Curb extensions or islands that alternate from one side of the street to the other, forming S-shaped curves.

Purpose: To slow vehicle speed mid-block using horizontal deflection.

Potential Advantages
- May reduce speed.
- Minimal impact to emergency vehicles.
- Does not restrict access to residents.
- Can be aesthetically pleasing if landscaped.

Potential Disadvantages
- May increase conflicts between motor vehicles and bicyclists and pedestrians.
- May create opportunities for head-on collisions on narrow streets.
- May divert traffic to parallel streets.
- Loss of curbside parking.
- Maintenance responsibility if landscaped.

Cost: $1,000 per 250 sq. ft. of offset; $22,500 - $37,000

Chokers/Slow Points

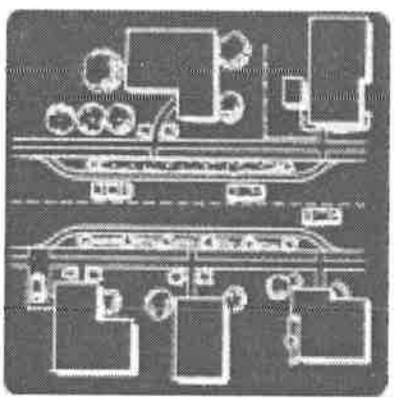
Description: Curb extensions on one or both sides of the street that narrow the street at that location. They may be designed to alter the path of travel or to create single lane, one-way traffic.

Purpose: To reduce vehicle speed mid-block; to increase pedestrian safety.

Potential Advantages
- Reduces vehicle speed (more effective when used in series).
- Can reduce crossing distance for pedestrians.
- Aesthetically pleasing if landscaped; provides visual obstruction.

Potential Disadvantages
- Some choker designs can be hazardous for cyclists; however the device can be designed to be safe and comfortable for cyclists.
- May create conflict between opposing drivers.
- May impact emergency response times.
- May divert traffic to adjacent streets without traffic calming.
- Maintenance responsibility if landscaped.
- Reduces curbside parking.

Cost: $5,000 - $15,000 per pair of offset curb extensions.



Full Closures

Description: Complete closure of a street either at an intersection or at a mid-block location.

Purpose: To reduce traffic volume and speed.

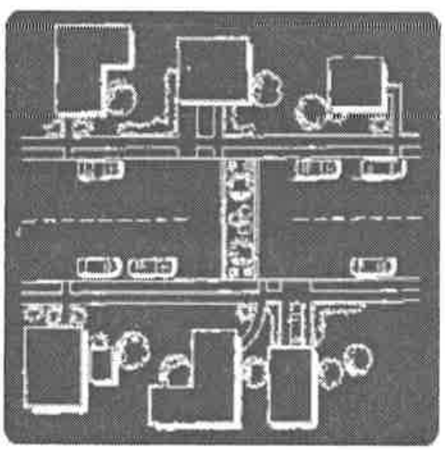
Potential Advantages

- Effective at reducing traffic speeds and volumes.
- Improves traffic safety.
- Can allow bicycle and pedestrian through-movements.
- Can be designed to allow emergency vehicle access.
- Aesthetically pleasing if landscaped.
- Creates effective dead-ends that may encourage pedestrian activity.

Potential Disadvantages

- May impact emergency response times.
- May divert traffic to adjacent streets.
- May increase trip length.
- May create confusion for users unless signed properly.

Cost: $5,000 - $40,000



Lane Narrowing

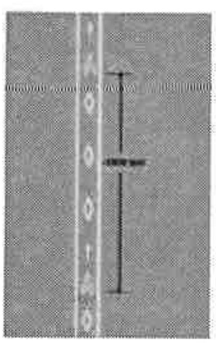
Description: Narrowing travel lanes on streets using striping (lane lines) or changes in parking configuration (angled parking or changes in parking density).

Purpose: To slow traffic speed.

Potential Advantages
- Changes can be implemented quickly.
- Striping can be modified easily if paint is used.
- Requires minimum maintenance.
- Speed may decrease and safety may be improved through the provision of positive guidance to drivers.

Potential Disadvantages
- May increase car/bike conflicts.
- Would increase regular maintenance cost.
- Residents do not always perceive striping as an effective tool for speed reduction.

Cost :The cost of lane striping is variable depending upon the type and amount installed. Crosswalks and other pavement markings are between $200 and $500 per installation. Signs are typically $200 per installation.



Median Barriers

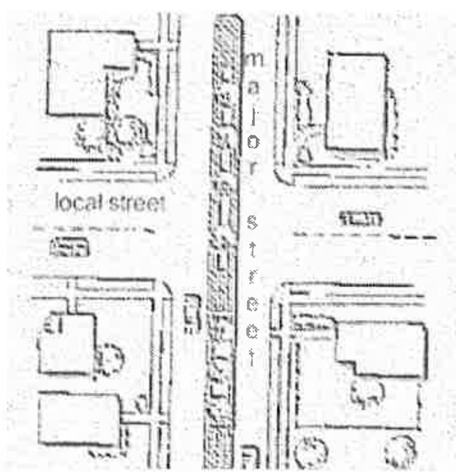
Description: Islands located along the centerline of a street and continuing through an intersection to block through movement across a major street.

Purpose: To reduce traffic speed using roadway narrowing on the street with the median, and to increase pedestrian safety. Traffic volume is reduced on cross streets because through traffic is eliminated.

Potential Advantages
- Makes intersection safer by reducing the number of conflicting turning movements.
- Can be designed to allow through-movement for cyclists traveling on local street.
- Reduces local street volumes.
- Aesthetically pleasing if landscaped.
- Eliminates the need for future traffic signal installation.

Potential Disadvantages
- May shift traffic to other locations where turn opportunities exist.
- May inconvenience local residents.
- May impact parking on the major street depending on lane width.
- Blocks emergency vehicle access and delays emergency response
- Maintenance responsibility if landscaped.

Cost: $10,000 - $20,000



Semi-Diverters

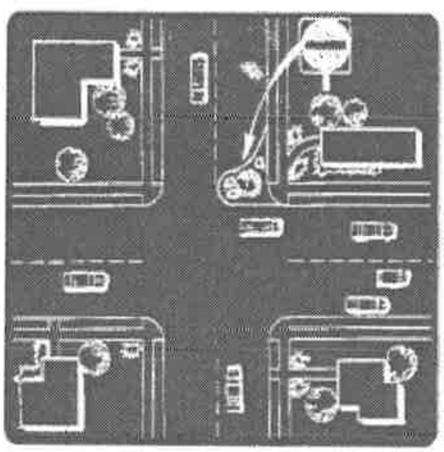
Description: Barriers that block travel in one direction for a short distance on otherwise two-way streets.

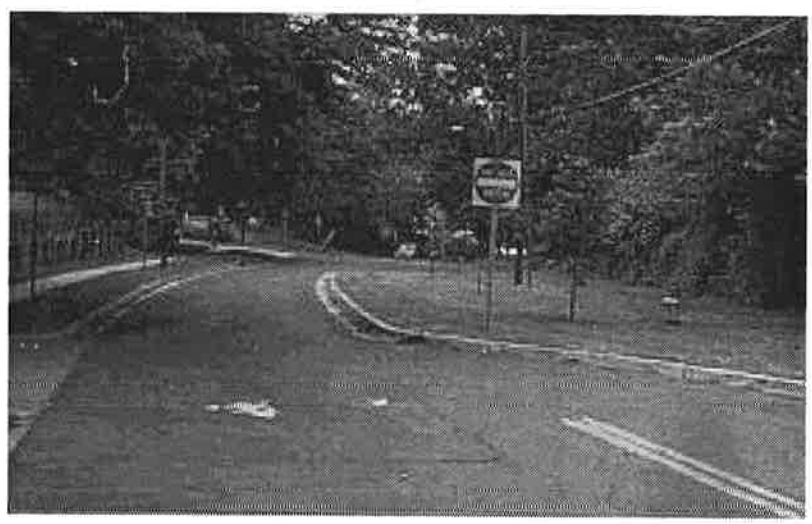
Purpose: To reduce traffic volume in the diverted direction.

Potential Advantages
- Restricts movement into a street while maintaining access and movement within the street block for residents.
- Reduces cut-through traffic.
- More self-enforcing and aesthetically pleasing than turn restriction signing.
- Reduces crossing distance for pedestrians.
- Aesthetically pleasing if landscaped.
- Emergency vehicles can travel in restricted direction.
- Can be designed to provide two-way access for bicycles.

Potential Disadvantages
- May divert traffic to parallel streets without traffic calming measures.
- May increase trip length for some residents.
- Curbside parking spaces must be eliminated adjacent to device.
- May increase emergency response times as they maneuver around the barrier.

Cost: $10,000 - $20,000





Traffic Circles

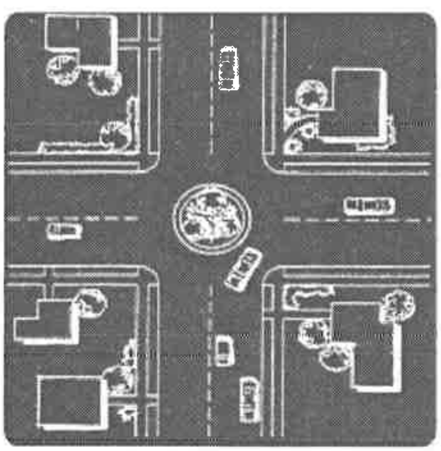
Description: Islands of varying dimensions placed in intersections around which traffic circulates.

Purpose: To slow vehicle speeds at intersections using horizontal deflection and a visual deterrent to higher speeds.

Potential Advantages
- May reduce vehicle speeds.
- Improve safety.
- Visually appealing if landscaped.
- Create a visual obstruction that deters through traffic.
- Do not restrict access for residents.

Potential Disadvantages
- Effect on vehicle speed limited to device's immediate vicinity.
- Loss of curbside parking at each corner (typically 25' to 30' of curb space is restricted at each approach).
- May increase emergency vehicle response time.
- May limit truck and bus access.
- Maintenance responsibility if landscaped.
- Automobile driver's lines of sight may be reduced if landscaped.
- May promote deliberate violation of proper movement.
- May divert traffic to parallel streets.

Cost: $5,000 to $15,000



Raised Crosswalks

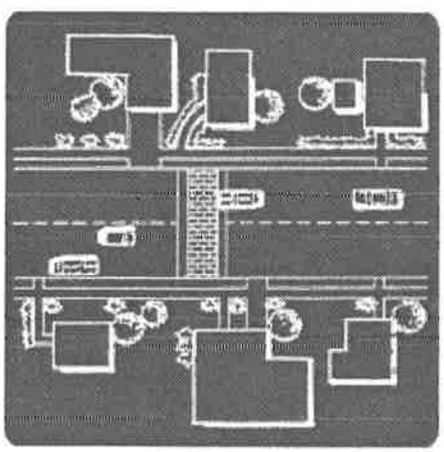
Description: Raised pavement (similar to a speed table) that may be outfitted with crosswalk markings and/or signage to channelize pedestrian crossings, providing pedestrians with a level street crossing. May be used mid-block or at intersections.

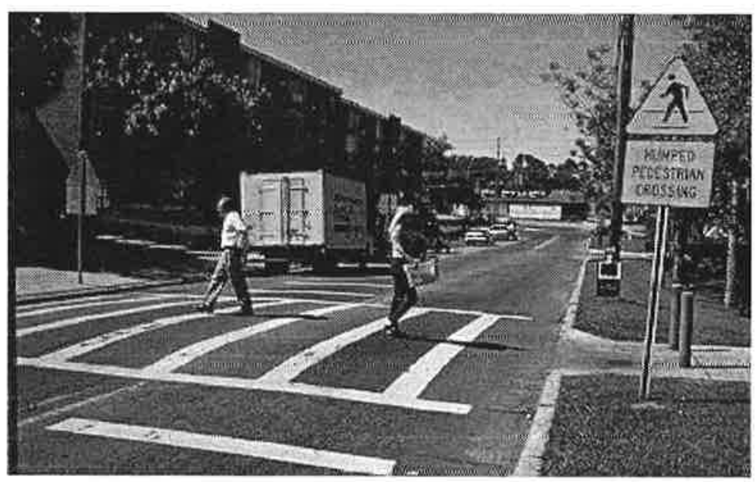
Purpose: To reduce vehicle speeds mid-block and to improve pedestrian safety.

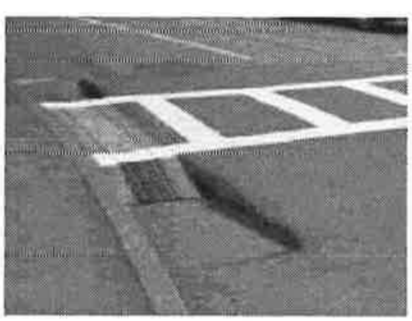
Potential Advantages
- May reduce vehicle speeds.
- Less disruptive than speed humps.
- May improve safety for pedestrians by making them more visible.

Potential Disadvantages
- The physical forces exerted by this vertical deflection device upon fragile persons with disability may cause injury.
- Less effective at speed reduction than speed humps.
- May impact emergency vehicle response.
- May disrupt drainage depending on design.
- May divert traffic to other streets.
- May increase noise.
- May give pedestrians a false sense of security.

Cost: $2,000 per location.







Raised Intersections

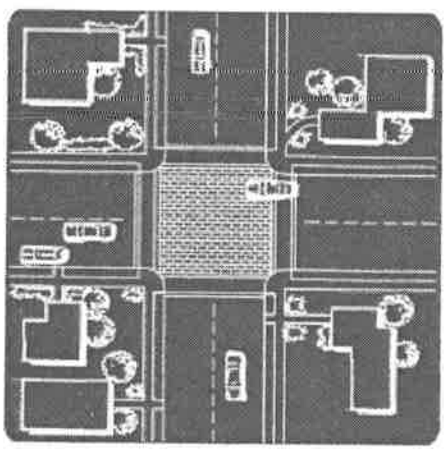
Description: Flat raised areas covering entire intersections with ramps on all approaches and often with brick or other textured materials on the flat section.

Purpose: To slow vehicle traffic at an intersection.

Potential Advantages
- Slows vehicles in intersections and therefore makes conflict avoidance easier.
- Highlights intersection.
- Improves pedestrian safety.
- Aesthetically pleasing if well designed.
- Effective speed reduction at intersection.

Potential Disadvantages
- May increase emergency response time.
- May increase turning difficulty.
- Increases maintenance.
- Impact on speed limited to within approximately 200' of intersection.
- May increase noise due to acceleration and braking.

Cost: $6,000 - $8,000



Speed Humps/Tables

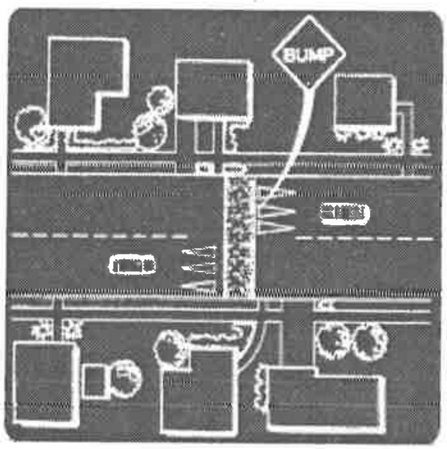
Description: Raised section of pavement across the roadway with curved transitions. Humps are generally 3.5" high and 12' wide. Elongated speed humps (speed tables) are generally 3"-4" high x 22' wide. Impacts on vehicle speed vary with size of device.

Purpose: To reduce vehicle speed using vertical deflection.

Potential Advantages
- Reduces vehicle speed.
- Can reduce vehicular volumes.
- Does not restrict parking.
- Requires minimum maintenance.

Potential Disadvantages
- May increase emergency response times.
- May divert traffic to parallel streets.

Cost: $2,000 - $6,800



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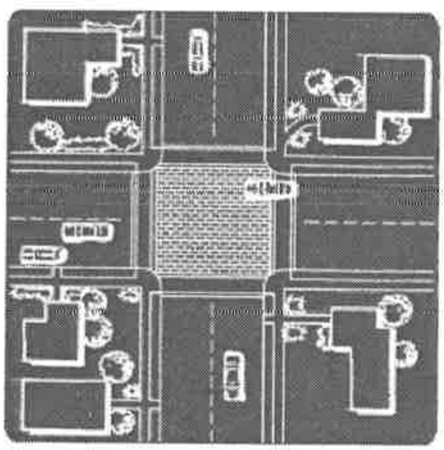
Cost: $6,000 - $8,000



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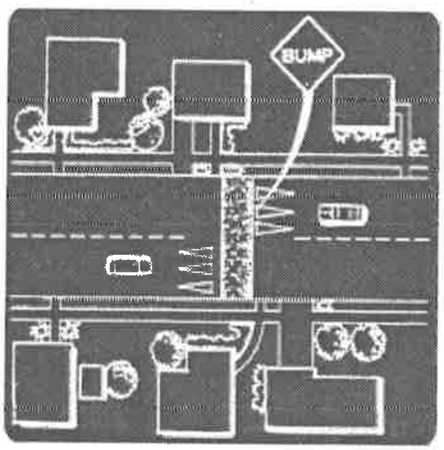
Purpose: To reduce vehicle speed using vertical deflection.

Potential Advantages
- Reduces vehicle speed.
- Can reduce vehicular volumes.
- Does not restrict parking.
- Requires minimum maintenance.

Potential Disadvantages
- May increase emergency response times.
- May divert traffic to parallel streets.

Cost: $2,000 - $6,800



Textured Pavement

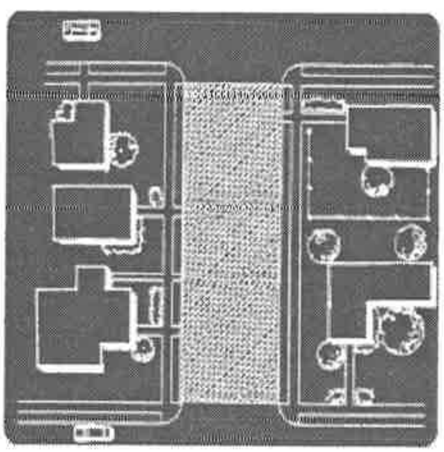
Description: A textured surface used in the roadway or crosswalk that causes drivers to feel a slight vibration over some distance, while improving the aesthetic quality of the street environment. May use brick or stone, but for safety and maintenance reasons, imprinted concrete or pavers that are less slick, less bumpy and easier to maintain are preferable.

Purpose: To reduce vehicle speed.

Potential Advantages
- Reduces vehicle speeds.
- Improves pedestrian safety.
- Can be aesthetically pleasing.

Potential Disadvantages
- Increases vehicle noise.
- Some materials can create hazards for cyclists and pedestrians, particularly when wet.
- Can be high maintenance.
- Materials like cobblestones provide too much texture and can create hazards for the disabled, particularly when the material begins to degrade.

Cost: Varies widely depending on type and amount of material used.



Traffic Impact Analysis Guidelines

DKS *Associates*

TRANSPORTATION SOLUTIONS

Transportation Impact Study (TIS) Guidelines

New development can impact the surrounding roadway system by adding to existing traffic volumes or altering traffic patterns. In addition to designing appropriate access for proposed developments, planners and developers should try to maintain a satisfactory level of transportation service and safety for all roadway users.

Traffic access and impact studies gather and analyze information that will help determine the need for any improvements to interior, adjacent, and nearby transportation systems. Not all development proposals require a traffic access and impact study. In most cases, developers should complete a preliminary trip generation assessment to determine if a TIS must be completed prior to the actual submission of plans.

A PM peak hour trip generation assessment showing 10 or more trips warrants a study.

The Applicant's Responsibilities

- The applicant of the proposed project must contact City staff to verify the development's projected trip generation, and to confirm whether or not a study will be required.
- If a study is required, the applicant must select a registered traffic or transportation engineer to prepare the study. This person should consult with City staff to determine the scope of the study, review the collected data, and/or discuss any assumptions that will be used in the study.
- The applicant must submit a copy of the study along with the application and other materials required for submission.
- Any corrections to the study based on the review team's comments are the responsibility of the applicant's study preparer.
- All expenses relating to study preparation and submission will be borne by the applicant.

Transportation Study Format

The Transportation Impact Study report shall include the following as a minimum:

Executive Summary

Summary of analysis, conclusions, and recommended improvements.

Description of Proposed Development

- A project description including site characteristics, such as proposed access and circulation plans, and all existing and proposed land uses for the site.
- A study area description including surrounding land uses, approved developments, street system characteristics, transit service, pedestrian and bicycle

facilities, street functional classification and any planned transportation improvements identified in the Sherwood TSP, the Washington County TSP or Metro's RTP.

Existing Conditions

- Existing zoning and land uses.
- Existing street network including street names and functional. classification as well as pavement, shoulder and sidewalk widths, striping and channelization, freight access and loading areas.
- Driveway locations.
- Area intersections.
- Existing traffic volumes and conditions, including traffic generated by other approved developments or phases of developments.

Traffic Counts: Turn-movement counts must be conducted on Tuesday, Wednesday or Thursdays, not containing holidays, during both the morning (7-9am) and evening (4-6pm) peak periods. Other peak hours (mid-day peak 11:30am to 1:30pm, weekend, holidays etc) may also be required depending on the specific land use and location of the project.

- Existing intersection performance including volume-to-capacity ratios and control delay calculations based on the Highway Capacity Manual (HCM) 2000 methodology for signalized and unsignalized intersections.
- Public transit availability including stop and shelter locations, route numbers, headways, bus pullouts and times of service.
- Bicycle and pedestrian facilities including bike lanes, sidewalks, access ways and multi-use paths in the area.
- Collision data for the most recent three-year period available.
- Access spacing must comply with the Oregon Highway Plan for ODOT facilities, the Washington County TSP for county facilities and the Sherwood TSP on city roads.
- Other information deemed important by City Staff.

Future Analysis

Buildout year

Site generated traffic, including trip generation use code, trip distribution and assignment, modal split, and pass-by trips.

Trip Generation: The latest edition of the Institute of Transportation Engineers' (ITE) Trip Generation handbook should be used for trip generation forecasts. If a land use is not covered by ITE, or if City staff deem it necessary, trip generation must be obtained from field observations at a similar land use.

Pass-by trips must be considered for retail oriented development. "Pass-by" trips are made as intermediate stops between an origin and a primary trip destination (i.e., home to work, home to shopping, etc.) "Captured Trips" are trips that do not enter or leave the driveways of a project's boundary within a mixed-use development.

Transportation Demand Management (TDM) trip reduction methods can only be used after consultation and approval from City staff.

- The regional traffic model should reflect the most current land use and planned improvements (i.e., where programming or funding is secured). If a general plan buildout model is not available, the closest forecast model year to build-out should be used. If a traffic model is not available, historical growth rates and current trends can be used to project future traffic volumes. The TIS should clearly describe any changes made in the model to accommodate the analysis of a proposed project

- Added, background and total traffic assumptions and calculations

Long-Range forecast year

- Site generated traffic, including trip generation use code, trip distribution and assignment, modal split, and pass-by trips

- The regional traffic model should reflect the most current land use and planned improvements (i.e., where programming or funding is secured). If a general plan buildout model is not available, the closest forecast model year to build-out should be used. If a traffic model is not available, historical growth rates and current trends can be used to project future traffic volumes. The TIS should clearly describe any changes made in the model to accommodate the analysis of a proposed project

- Added, background and total traffic assumptions and calculations

Traffic Impacts

- Identification of impacts due to site added traffic in Buildout year and long-range forecast year including, but not limited to the following:
- Safety and sight distance;
- Street geometrics;

- Turn lane requirements, acceleration and deceleration lane analysis, queue length analysis and queue conflicts with adjacent accesses;
- Traffic signal warrants;
- Driveway impacts and conflicts;
- Bicycle, pedestrian and transit system impacts;
- On and off-street parking impacts and site requirements;
- Transportation system management and demand managements impacts; and
- Other identified impacts.

Mitigation Identification

- At a minimum, impacts of development on a signalized intersection shall be mitigated to a peak hour level of service of D and a volume-to-capacity ratio for each lane group no grater than 0.98.
- Site access points must comply with ODOT, Washington County and City of Sherwood designations.
- Methods for mitigation on and off-site impacts and mitigation recommendations.
- Discussion of whether on and of-site improvements are justified, reasonably related to, and roughly proportional to impacts of the proposed development.

Recommendations

- Clear statements of the applicant's recommended mitigation measures
- Drawings of existing and recommended improvements

Appendices

- Site plan;
- Traffic counts;
- Intersection performance calculation sheets for existing, buildout year and long-term scenarios; and
- Other relevant supportive information