

Transportation System Plan

**City of Molalla
Draft Transportation
System Plan**

Molalla, Oregon

May 2001

Transportation System Plan

City of Molalla Draft Transportation System Plan

Molalla, Oregon

Prepared for:
City of Molalla
117 N. Molalla Avenue
P.O. Box 248
Molalla, Oregon 97038
(503) 829-6855

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

Project Manager: Paul Ryus
Project Analyst: Matt Hughart
Project Principal: Mark Vandehey

Project No. 2542/4597

May 2001

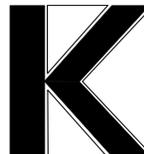


Table of Contents

Section 1	Introduction.....	1
Section 2	Existing Conditions.....	7
Section 3	Future Conditions Analysis.....	41
Section 4	Alternatives Analysis.....	58
Section 5	Transportation System Plan.....	81
Section 6	Transportation Funding Plan.....	102
Section 7	Land Use Ordinance Modifications.....	109
Section 8	Transportation Planning Rule Compliance.....	113
Section 9	References.....	118
Appendix A	Description of Level-of-Service Methods and Criteria	
Appendix B	Potential Funding Sources	
Appendix C	Recommended Code Changes	

List of Figures

Figure 1	Regional Map.....	3
Figure 2	Study Area Map	9
Figure 3	Existing Pedestrian Facilities.....	18
Figure 4	Existing Bicycle Facilities.....	20
Figure 5	Fixed Route Transit.....	22
Figure 6	Existing Railroad Facilities.....	26
Figure 7	Roadway Ownership	31
Figure 8	Existing Functional Classification	32
Figure 9	Pavement Conditions	33
Figure 10	Existing Intersection Levels of Service.....	35
Figure 11	Average Daily Traffic Volumes.....	37
Figure 12	Safety and Geometry Issue Locations	39
Figure 13	Current Zoning Map.....	44
Figure 14	Current Molalla Land Use Plan	45
Figure 15	2019 No-Build Intersection Level of Service	52
Figure 16	Project Alternatives Analyzed.....	62
Figure 17	Possible Functional Classes: Forest Road as Industrial Access.....	71
Figure 18	Possible Functional Classes: Forest Road as Downtown Bypass	72
Figure 19	Functional Classification System.....	85
Figure 20	Street Cross-Sections	86
Figure 21	Potential STAs and UBAs	90
Figure 22	Bicycle System Plan.....	94

List of Tables

Table 1	Molalla Street Standards.....	14
Table 2	Existing Levels of Service, Weekday P.M. Peak Hour	36
Table 3	Intersection Crash Analysis	36
Table 4	Roadway Segment Crash Rates	38
Table 5	Vacant Residential Land Inventory	43
Table 6	Build-Out Population	43
Table 7	2019 Future Forecast Intersection Operations Weekday PM Peak Hour Land Use Scenario #1 (south & east growth).....	51
Table 8	2019 Future Forecast Intersection Operations Weekday PM Peak Hour Land Use Scenario #2 (north & west growth).....	53
Table 9	Access Spacing and Operations Standards for State Highways	56
Table 10	Intersection Project Summary.....	63
Table 11	Roadway Design Elements by Functional Classification	73
Table 12	Functional Classification System Summary.....	84
Table 13	Street Design Standards Summary	87
Table 14	Highway 213 and Highway 211 ODOT Access Management Standards	89
Table 15	Minimum Intersection Spacing Standards.....	91
Table 16	Private Access Driveway Width Standards	91
Table 17	Transportation Improvement Program Summary	97
Table 18	Sources of Street Fund – Fiscal Year 1999-2000	104
Table 19	Development of a Transportation System Plan	114
Table A1	Level of Service Definitions (Signalized Intersections).....	A-1
Table A2	Level of Service Criteria for Signalized Intersections.....	A-2
Table A3	Level of Service Criteria for Unsignalized Intersections.....	A-2
Table A4	Level of Service Criteria for Unsignalized Intersections.....	A-3
Table B-1	Summary of Road-Related Transportation Funding Programs	B-2
Table B-2	Currently Used Revenue Sources for Cities (Millions of 1995 Dollars).....	B-4
Table B-3	Currently Used Public Transportation Revenue Sources in Oregon	B-5
Table C-1	City of Molalla TPR Code Compliance Coordination and Review	C-1
Table C-2.A	City of Molalla TPR Code Compliance Access Management	C-2
Table C-2.B	(continued) City of Molalla TPR Code Compliance Access Management.....	C-3
Table C-2.C	(continued) City of Molalla TPR Code Compliance Access Management.....	C-4

Table C-3	City of Molalla TPR Code Compliance Protection of Transportation Facilities	C-5
Table C-4	City of Molalla TPR Code Compliance Implementation	C-6
Table C-5	City of Molalla TPR Code Compliance Bicycles and Pedestrians.....	C-7
Table C-6	City of Molalla TPR Code Compliance Permitted and Conditional Transportation Improvements	C-8
Table C-7	City of Molalla TPR Code Compliance Street Standards	C-9

Preface

This project is partially funded by a grant from the Transportation Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. This document does not necessarily reflect the views or policies of the State of Oregon.

The progress of this plan was guided by the Management Team, Transportation Advisory Committee, and Consultant Team identified below.

MANAGEMENT TEAM:

Gordon Euler
City of Molalla

Dean Madison
City of Molalla

Gene Green
City of Molalla

TRANSPORTATION ADVISORY COMMITTEE:

Rick Lefever

Tim Barnes

Shirley Lyons

Mike Cole

Mary Mckenzie

Advisory Committee members devoted a substantial amount of voluntary time and effort to the development of the Transportation System Plan, and their participation was instrumental in the development of the recommendations that are presented in this report. The Consultant Team and Management Team believe that the City of Molalla's future transportation system will be better because of their commitment.

CONSULTANT TEAM:

Kittelson & Associates, Inc.

OTAK

TW Environmental

Paul Ryus, P.E.

Todd Chase, AICP

Kate Moore

Mark Vandehey, P.E.

Stacy Sacher Goldstein

Matt Hughart

Section 1

Introduction

Introduction

The City of Molalla, in conjunction with the Oregon Department of Transportation (ODOT), initiated a study of the City's transportation system in 1998. This study will guide the management and development of appropriate transportation facilities within Molalla; incorporating the community's vision of future land use by addressing the potential for infill and redevelopment strategies, while also recognizing the potential future need for urban expansion. This report is formatted to provide Molalla with the necessary elements to be adopted as the transportation element of the City's comprehensive plan. In addition, this report provides ODOT and Clackamas County with recommendations that can be incorporated into their respective planning efforts.

State of Oregon guidelines stipulate that the TSP must be based on the current comprehensive plan land use map and must also provide a transportation system that accommodates that expected 20-year growth in population and employment that will result from implementation of the land use plan. As is discussed in this report, the City's comprehensive plan is due to be updated within 2-3 years following the completion of this TSP, and the current land use plan does not provide sufficient residential land to accommodate the City's forecast population growth. Consequently, this TSP examines two different potential land use alternatives to examine the transportation-related effects of urban expansion occurring in different sectors of the City.

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

- a road plan for a network of arterial and collector streets;
- a public transit plan;
- a bicycle and pedestrian plan;
- an air, rail, water, and pipeline plan;
- a transportation finance plan; and
- policies and ordinances for implementing the transportation system plan.

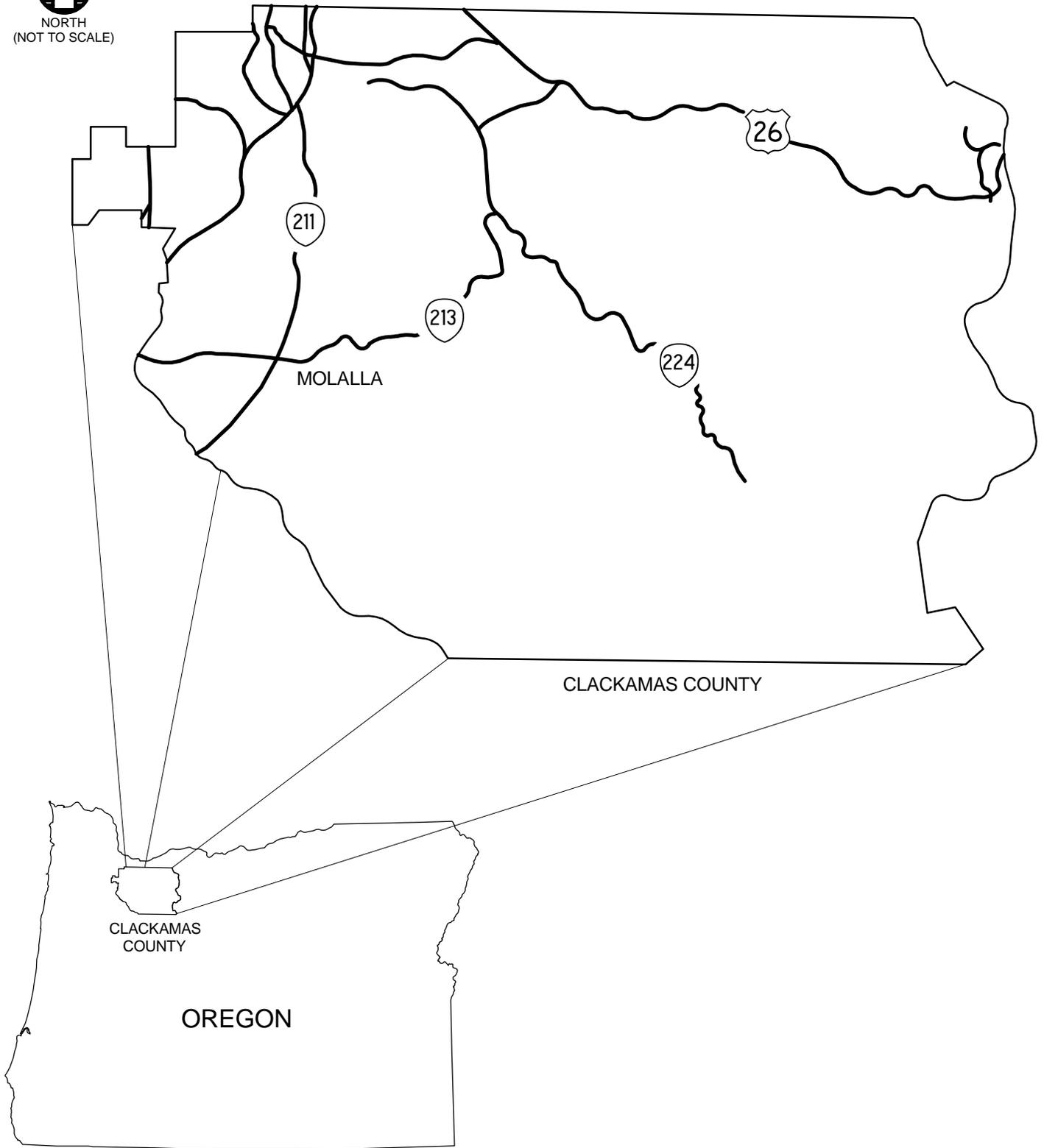
The TPR requires that alternative travel modes be given equal consideration with the automobile, and that reasonable effort be applied to the development and enhancement of the alternative modes in providing the future transportation system. In addition, the TPR requires that local jurisdictions adopt land use and subdivision ordinance amendments to protect transportation facilities and to provide bicycle and pedestrian facilities between residential, commercial, and employment/institutional areas. It is further stipulated that local communities coordinate their respective plans with county and state transportation plans.

STUDY AREA

The City of Molalla is located in the southwestern portion of Clackamas County, Oregon, as shown in Figure 1. Named after a small tribe of indigenous Native Americans known as the Molalas, the City of Molalla is home to about 5,395 residents (1998 estimate). With its location near the foothills of the Cascade Mountain range, Molalla's economy has historically been tied to the timber industry. However, recent initiatives have seen Molalla strive for a more diverse economy rooted in light industry and tourism, with the goal of improving the future outlook of the community.



NORTH
(NOT TO SCALE)



REGIONAL MAP

CITY OF MOLALLA, OREGON
TRANSPORTATION SYSTEM PLAN

FIGURE

1



The City of Molalla has historically grown up around the crossroads of Molalla Avenue and Main Street (Highway 211), where a significant amount of commercial development has occurred. Residential land uses are located throughout the city, particularly in the north and south central portions of the city. Recently, Molalla has seen several new single-family housing developments constructed in the northwestern portion of the city, east of Highway 213 and north of Tolliver Road. Industrial land uses are concentrated primarily in the southwestern section of the city, adjacent to Highway 211 and the old Molalla Forest Road.

PUBLIC INVOLVEMENT

The TSP planning process provided the citizens of Molalla with the opportunity to identify their priorities for future growth and development. Two committees were formed to guide the planning process: the Management Team and the Transportation Advisory Committee (TAC). The Management Team was composed of representatives of the City of Molalla and the consultant team. The Transportation Advisory Committee included several community members with a specific interest in transportation and land use planning in the community. ODOT was also represented throughout the project. The two committees convened at several key junctures of the project, including project inception and completion of the existing conditions analysis, presentation of the future conditions and alternatives analysis findings, and presentation of the draft TSP.

Meeting notices were published in the local newspaper, the *Molalla Pioneer*, and articles summarizing the results of the meetings were also published. The project also produced a series of newsletters to inform the public about the project. The TSP was adopted following public hearings before the City's planning commission and city council.

GOALS AND OBJECTIVES

The following transportation goals and objectives guided the development of this TSP:

Goal 1

Promote a balanced, safe, and efficient transportation system.

Objectives

1. Develop a multi-modal transportation system that avoids reliance upon one form of transportation as well as minimizes energy consumption and air quality impacts.
2. Protect the qualities of neighborhoods and the community.
3. Provide for adequate street capacity and optimum efficiency.
4. Promote adequate transportation linkages between residential, commercial, public, and industrial land uses.
5. Provide for the needs of the transportation disadvantaged to the greatest extent possible.

Goal 2

Ensure the adequacy of the roadway network in terms of function, capacity, level of service, and safety.

Objectives

1. Develop a functional classification system that addresses all roadways within the urban growth boundary.
2. In conjunction with the functional classification system, identify corresponding street standards that recognize the unique attributes of the local area.
3. Identify existing and potential future capacity constraints and develop strategies to address those constraints, including potential intersection improvements, future roadway needs, and future street connections.

4. Evaluate the need for modifications to and/or the addition of traffic control devices.
5. Identify access spacing standards.
6. Provide an acceptable level of service at all intersections in the City, recognizing the rural character of the area.
7. Identify existing and potential future safety concerns as well as strategies to address those concerns.

Goal 3

Promote alternative modes of transportation.

Objectives

1. Develop a comprehensive system of pedestrian and bicycle routes that link major activity centers within the City.
2. Encourage the use of alternative modes of transportation by providing a system that insures mobility for all users.
3. Encourage the continued use of public transportation services and identify improvements to further promote transit in the community.

Goal 4

Identify and prioritize transportation improvement needs in the City of Molalla, and identify a set of reliable funding sources that can be applied to these improvements.

Objectives

1. Develop a prioritized list of transportation improvement needs in the study area.
2. Develop construction cost estimates for the identified projects.
3. Evaluate the adequacy of existing funding sources to serve projected improvement needs.
4. Evaluate new innovative funding sources for transportation improvements.
5. Develop a transportation system development charge for the city to enhance current funding mechanisms.

TRANSPORTATION SYSTEM PLAN METHODOLOGY AND ORGANIZATION

The development of the City of Molalla's Transportation System Plan began with an inventory of the existing transportation system and a review of the local, regional, and statewide plans and policies that guide land use and transportation planning in the City. The inventory documented all major transportation-related facilities within the study area, which allowed for an objective assessment of the current system's physical characteristics, operational performance, safety, and general function. The inventory process and the documentation of current transportation conditions are presented in **Section 2** of this report. The findings of the existing conditions analysis were presented to and verified by the two TSP committees.

Upon completion of the existing conditions analysis, the focus of the project shifted to forecasting future travel demand and the corresponding long-term future transportation system needs. Development of long-term (year 2019) transportation system forecasts relied heavily on the City's population growth projections. Based on these projections, and with input from the advisory committees, reasonable assumptions were drawn as to the potential for and location of future development activities. **Section 3** of this report, *Future Conditions Analysis*, details the development of anticipated long-term future transportation needs within the study area.

Section 4 of this report, *Alternatives Analysis*, documents the development and prioritization of alternative measures to mitigate identified safety and capacity deficiencies, as well as projects that would enhance the multi-modal aspects of the City's transportation system. The impact of each of the identified alternatives was considered on the basis of its potential costs and benefits, as well as its conformance with and potential conflicts to the City's transportation system and land uses. Ultimately, based on comments received from the Management Team and TAC, a preferred plan was developed that reflected a consensus as to which elements should be incorporated into the City's long-term transportation system.

Having identified a preferred set of alternatives, the next phase of the planning process involved presenting and refining the individual elements of the TSP through a series of decisions and recommendations. The recommendations identified in **Section 5**, *Transportation System Plan*, include a Roadway Network and Functional Classification Plan, a Pedestrian Plan, and a Bikeway Plan, as well as other multi-modal plans.

Section 6, *Transportation Funding Plan*, provides an analysis and summary of the alternative funding sources available to finance the identified transportation system improvements.

The recommended modifications presented in **Section 7**, *Policies and Land Use Ordinance Modifications*, address major land use transportation issues identified during the development of the TSP and reflect the desire to enhance all modes of the transportation system. These ordinances are needed to implement the TSP.

Finally, **Section 8**, *Transportation Planning Rule Compliance*, lists the requirements of the Oregon Transportation Planning Rule (OAR 660 Division 12) and identifies how the City of Molalla TSP satisfies each criterion.

Section 2

Existing Conditions

Existing Conditions

INTRODUCTION

The development of this transportation system plan (TSP) began with an assessment of current land use and transportation system conditions. This section describes the existing condition of the City's transportation system, including highway, pedestrian, bicycle, transit, rail, air, water, freight movement, and pipeline/transmission transportation modes in terms of each mode's current performance and needs. This section provides an inventory of existing facilities and serves as a baseline against which future conditions can be compared.

STUDY AREA AND LAND USE

Figure 2 presents an aerial photo of Molalla and its immediate vicinity, with the current city limits and urban growth boundary (UGB) indicated. The study area for the TSP generally consists of the area within the UGB, although in some instances areas outside the UGB are also addressed, where issues extend into the rural areas surrounding the City. Because the City has collected inventory data for most streets within the city limits, the maps presented in this section depict all of the inventory data. However, the TSP's scope generally covers only the more important roadways within the City—namely, the collector and arterial street system—and not all streets for which inventory data are shown are addressed in this report.

Commercial development is centered on the downtown area around the intersection of Main Street and Molalla Avenue, with commercial development extending east and west along Main Street. A new commercial node is emerging centered on the intersection of Highways 211 and 213 about two miles west of downtown Molalla. Industrial land is centered along the Oregon Pacific Railroad line, with additional industrial land located along the north side of Molalla Forest Road. Residential development extends northeast and southeast from downtown, with additional development located along and north of Toliver Road, including the newer subdivisions located along the northwest and north central edges of the City. Major institutional uses include the Buckaroo Grounds in the northeast corner of the City, the four school campuses scattered around the City, the adult center on Kennell Avenue, the U.S. Forest Service Office at the Main Street/Mathias Avenue intersection, and various City and school offices and yards. The southwest, west central, and north central portions of the City contain the greatest amounts of underdeveloped land.

PLANS AND POLICIES REVIEWED

The documents listed below were reviewed during this review of existing conditions. These documents contain one or more of the following:

- transportation system inventory information that has been incorporated into this TSP;
- policies or goals that affect the evaluation of existing conditions; and/or
- standards that this TSP needs to meet.

Transportation Planning Rule

The Transportation Planning Rule (TPR) is found in the Oregon Administrative Rules Chapter 660, Division 12. The TPR requires that local governments adopt transportation plans and amend existing land use regulations as needed to achieve the following objectives:

- plan for local transportation systems in a way that is consistent with the state plans;
- develop travel demand forecasts that can reduce reliance on automobiles and achieve compact urban development;
- plan for a road network that identifies local street connections and extensions to reduce reliance on arterials;
- provides for bicycle and pedestrian facilities and circulation patterns;
- reduces excessive standards for local street width and right-of-way to make streets more livable and safer for bicycles and pedestrians; and
- assure that new developments and land divisions include bicycle and pedestrian accessways and circulation patterns.

The TPR was most recently amended in February 1999 and this TSP is being prepared using the most recent version of the rule.

Oregon Transportation Plan (1992)

The Oregon Transportation Plan (OTP) contains a policy element that defines the state's transportation goals, policies, and actions for the next 40 years. It provides direction on coordinating transportation modes, and the relationship of transportation to land use, economic development, the environment, and energy use. It also addresses the coordination of transportation between federal, state, and local plans. The system element of the OTP identifies a coordinated multimodal transportation system, with a network of facilities and services for all modes of travel including air, rail, highway, bikeway, pedestrian, public transit, pipelines, waterways, and marine transportation.

The OTP was adopted by the Oregon Transportation Commission on September 15, 1992. The financing program and legislation needed to implement the plan was submitted to the 1993 legislature; however, the financing plan failed to win legislative approval at that time.

The goals and policies stated in the plan define a balanced and efficient transportation system which promotes accessibility to all potential users. The purpose of the Oregon Transportation Plan is to guide the development of a safe, convenient, and efficient system which promotes economic prosperity and livability for all Oregonians. The goals of the OTP are:

- **GOAL 1—Characteristics of the System.** To enhance Oregon's comparative economic advantage and quality of life by the provision of a transportation system with the following characteristics: balance, efficiency, accessibility, environmental responsibility, connectivity among places, connectivity among modes and carriers, safety, and financial stability.
- **GOAL 2—Livability.** To develop a multimodal transportation system that provides access to the entire state, supports acknowledged comprehensive land use plans, is sensitive to regional differences, and supports livability in urban and rural areas.
- **GOAL 3—Economic Development.** To promote the expansion and diversity of Oregon's economy through the efficient and effective movement of goods, services, and passengers in a safe, energy efficient, and environmentally sound manner.

- **GOAL 4—Implementation.** To implement the Transportation Plan by creating a stable but flexible financing system, by using good management practices, by supporting transportation research and technology, and by working cooperatively with federal, regional, and local governments, Indian tribal governments, and the private sector and citizens.

The plan defines minimum levels of service for various transportation modes. These are addressed later in this memorandum in the sections describing the various transportation modes serving Molalla.

The OTP is part of an ongoing transportation process within the Oregon Department of Transportation (ODOT). Oregon Revised Statute (ORS) 184.168 (1) requires state agencies to use the OTP to guide and coordinate transportation activities. The OTP and its supporting modal plans, described below, must comply with the state agency coordination program and state-wide planning goals. The TPR requires ODOT to identify a system of transportation facilities and services adequate to meet identified state transportation needs. The OTP, including the policy and system elements, and the adopted modal and facility plans, is intended to meet the requirements for the state transportation system plan.

Oregon Public Transportation Plan (1997)

The Oregon Public Transportation Plan, like the other state modal plans, takes the broad policy framework developed by the OTP and applies it to a specific mode, in this case public transportation. The plan identifies three goals for the state's public transportation system:

- **GOAL 1—Purpose of the Transportation System.** The public transportation system should provide mobility alternatives to meet daily medical, employment, educational, business and leisure needs without dependence on single-occupant vehicle transportation. The system should enhance livability and economic opportunities for all Oregonians, and lessen the transportation system's impact on the environment. The public transportation system should provide services and meet transportation needs in a coordinated, integrated, and efficient manner.
- **GOAL 2—The Components of the Public Transportation System.** The public transportation system should be statewide, well-maintained and managed, and safe and pleasant to use. The public transportation system should be composed of a hierarchy starting with (level 1) ridesharing or volunteer programs and moving upward as population and density increase to include (level 2) taxi or minibus service and finally adding (level 3) fixed-route services where appropriate.
- **GOAL 3—The Management and Financing of the Public Transportation System.** The public transportation system should be planned, operated, managed and financed cooperatively by public and private organizations representing statewide, regional and local interests.

Oregon Pedestrian and Bicycle Plan (1996)

This modal plan presents the state's programs, design practices, and standards relating to bicycle and pedestrian transportation, and serves as a useful reference for local jurisdictions for planning and designing pedestrian and bicycle facilities. The plan suggests priorities for implementing bicycle and pedestrian projects. It also summarizes the requirements for bicycle and pedestrian improvements for bicycle and pedestrian elements in local and regional TSPs.

Oregon Highway Plan (1999)

The Oregon Highway Plan, updated within the past year, is a policy and strategies document that serves as the highway element of the Oregon Transportation Plan. It guides operating and financial decision-making by developing roadway standards, identifying roadway needs through the year 2020, and developing

funding strategies to address these needs. It sets standards for access and traffic signal spacing, as well as traffic operations.

The plan defines five highway-related goals:

- **GOAL 1—System Definition.** To maintain and improve the safe and efficient movement of people and goods, and contribute to the health of Oregon's local, regional, and statewide economies, and livability of its communities.
- **GOAL 2—System Management.** To work with local jurisdictions and federal agencies to create an increasingly seamless transportation system with respect to the development, operation, and maintenance of the highway and road system that: (1) safeguards the state highway system by maintaining functionality and integrity; (2) ensures that local mobility and accessibility needs are met; and (3) enhances system efficiency and safety.
- **GOAL 3—Access Management.** To employ access management strategies to ensure safe and efficient highways consistent with their determined function, ensure the statewide movement of goods and services, enhance community livability and support planned development patterns, while recognizing the needs of motor vehicles, transit, pedestrian, and bicyclists.
- **GOAL 4—Travel Alternatives.** To optimize the overall efficiency and utility of the state highway system through the use of alternative modes and travel demand management strategies.
- **GOAL 5—Environmental and Scenic Resources.** To protect and enhance the natural and built environment throughout the process of constructing, operating, and maintaining the state highway system.

Because available funding is projected to be less than half what is needed to address all identified highway needs over the next 20 years, the Highway Plan places the highest priority on investments that improve the safety of the state highway system, or manages and preserves the physical infrastructure.

Oregon Statewide Transportation Improvement Plan, Draft 2000-2003

The STIP defines how the state will allocate its transportation budget to specific projects during the next four years. Projects identified in the draft STIP are subject to change, and the final STIP may contain more or fewer projects than identified in the draft STIP. Nevertheless, the draft STIP is useful for identifying areas on the statewide transportation system where transportation improvements are needed, as well as funding priorities for other transportation modes.

The draft STIP identifies no state projects within the Molalla UGB through 2003. However, two projects are identified on Highway 213 in the vicinity of Liberal: replacing a bridge over a creek about ¼ mile north of Macksburg Road, and constructing a left-turn median between Liberal Way and Molalla Avenue and improving the turning radius in the northwest corner of the Liberal Way intersection. Both projects are currently scheduled for construction in 2002.

Clackamas County Rural Transportation Plan (in process)

The Clackamas County Rural Transportation Plan was started in 1997, but is not yet complete. The plan will address transportation needs in the unincorporated portions of Clackamas County lying outside the Portland metropolitan urban growth boundary. Existing conditions information developed for the rural county plan has been incorporated into this memorandum.

City of Molalla Comprehensive Plan (1980)

The City of Molalla's Comprehensive Plan was adopted on June 23, 1980. The purpose of the Comprehensive Plan is to inventory the existing conditions and formulate policies for all city wide decision-making processes. This plan was prepared and adopted in accordance with Statewide Planning Goals as approved by the Land Conservation and Development Commission (LCDC).

Within the Comprehensive Plan, the transportation element defines several transportation goals:

- **Statewide Goal 11**—To plan and develop a timely, orderly, and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.
- **Statewide Goal 12**—To provide and encourage a safe, convenient and economic transportation system.
- **Statewide Goal 13**—To conserve energy.
- **Community Goal**—To minimize the vehicular impact upon the City of Molalla and to integrate Molalla with the various transportation planning and development systems within the state.

To achieve these statewide and community goals, the plan establishes several transportation policies. Several of these policies are listed below:

- To designate arterial, collector, and local streets for urban and rural areas within the Urban Growth Boundary.
- To require applicants for development in the Molalla urban area to construct streets within and serving the development to city standards including curbs, gutters, sidewalks and drainage facilities.
- To provide safe pedestrian access to schools, parks, and shopping to make walking a realistic alternative to driving within the city.
- To encourage bicycle paths within the city to the greatest extent possible, funds permitting.
- To explore all possibilities for developing an alternative truck route to divert the heavy truck traffic away from the core area.
- To provide for the needs of the transportation handicapped to the greatest extent possible.
- To urge all appropriate state and regional agencies to seriously consider the use of existing rail facilities for the development of a light rail mass transit system that would ultimately serve the City of Molalla.

Implementing Measures

Implementing measures contain the ordinances and regulations that implement policy-making documents such as the Comprehensive Plan.

The Molalla Zoning Ordinance (Ord. 1980-6 §1.1) implements the Comprehensive Plan and promotes the health, safety, and general welfare of the public. From a transportation perspective, the Zoning Ordinance strives to “lessen congestion on the streets” and “facilitate adequate provisions for community utilities such as transportation.” Specifically, the Zoning Ordinance regulates minimum parking space requirements per dwelling unit, sidewalk provisions by land use type, minimum off-street parking requirements in each zoning district, and driveway spacing in residential areas.

The Molalla Subdivision Ordinance contains design standards and regulations for the dedication of streets in subdivision developments. Table 1 lists the minimum right-of-way and roadway widths:

**Table 1
 Molalla Street Standards**

Type of Street	Right-of-way Width (feet)	Roadway Width (feet)
Arterial	75	44
Commercial & Industrial	60	36
Collector	60	36
Minor	50	36
Radius of turnaround at end of cul-de-sac	50	45
Non-continuous aligning street not exceeding 1,000 feet	50	20
Alley	20	20

Other standards set forth by the Subdivision Ordinance include the design of various street elements. These standards are listed as follows:

- Streets should be designed in alignment with existing travel corridors.
- Street intersections shall be as close to 90 degrees as possible, but not less than 60 degrees.
- Streets terminating with a cul-de-sac should be as short as possible with a maximum length of 400 feet.
- Street grades should not exceed seven percent on major or secondary arterials, ten percent on collector streets, or fifteen percent on any other streets.
- Centerline radii of curves shall not be less than three hundred feet on major arterials, two hundred feet on secondary arterials, or one hundred feet on other streets. On arterials there shall be a tangent of not less than one hundred feet between reversed curves.

Provisions governing pedestrian elements are as follows:

- Sidewalks shall be provided for all developments zoned C-1 and C-2 (commercial), with a minimum width of eight feet.
- Sidewalks shall be constructed on both sides of all subdivision streets.

Transportation Study for the City of Molalla and Surrounding Area (1989)

In 1989, the Clackamas County Department of Transportation and Development and the City of Molalla commissioned a Transportation Study for the Molalla Urban Area. That report analyzed the existing and future transportation conditions within the City and an area extending several miles beyond the Urban Growth Boundary. The following is summary of the findings and recommendations of that report:

Findings

- Molalla's functional street classification system consists of arterial, collector, and minor streets.
- Based on 1988 ADT volumes, there are short periods of delay and congestion at the intersection of Highway 211/Molalla Avenue.
- Based on 1989 p.m. peak hour volumes, all key intersections operate at acceptable levels of service.
- Public transportation is provided by a private transportation service from the City of Molalla to the Clackamas County Community College in Oregon City.
- The City of Molalla lacks bicycle and pedestrian facilities on the majority of its streets.
- Access to and from Molalla from outside the City is limited. All available access routes experience heavy truck traffic and poor horizontal and vertical alignment.
- Traffic circulation within the City is considered poor due to the limited availability of north-south and east-west crossing streets along Highway 211 and Molalla Avenue.
- There is a considerable amount of truck traffic on Highway 211 (26 percent) and Highway 213 (10 percent).
- Numerous intersections within the City are problematic with issues ranging from poor configurations to overgrown vegetation.
- Molalla Forest Road is crucial to the future transportation network.

Short-Term Recommendations (within 5 years)

- Intersection improvements are recommended at the following state highway intersections: Highway 211/Leroy, Highway 213/Toliver Road, Highway 213/Molalla Avenue, Highway 213/Liberal Way, Highway 213/Macksburg Road, Highway 211 corridor from Leroy Street to Mathias Road.
- Road maintenance and intersection modifications are recommended at the county road intersection of Freyrer Park Road/Dickie Prairie Road.
- The City of Molalla should consider lane striping on all collector and arterial streets.
- The City should fully assess the current conditions of Molalla Forest Road.
- A traffic signal should be installed at the intersection of Molalla Avenue/Highway 211.
- Parking should be limited in the CBD during the peak traffic hours.
- A southbound left turn lane should be installed on Molalla Avenue for traffic turning onto Toliver Road.

Long-Term Recommendations (5-20 years)

State Highways

1. Provide full gravel shoulders along Highway 211 from Highway 213 to Meadowbrook and along Highway 213 from Freeman Road to Highway 211.
2. Provide a traffic signal at the intersection of Highway 211/Molalla Avenue.
3. Provide left turn lanes on all four legs of the Highway 211/213 intersection.

County Roads

4. Realign the intersection of Molalla Avenue/Vaughn Road.
5. Provide improvements to enhance safety along Freyrer Park Road/Dickie Prairie Road.
6. Realign Mathias Road/Freyrer Park Road.
7. Redesign Molalla Avenue/Wilhoit Road.

City Streets

8. Extend Heintz Road across the Southern Pacific Railroad.
9. Upgrade Molalla Forest Road to arterial standards.
10. Provide off street parking if on street parking is eliminated in the CBD.
11. Upgrade Tolliver Road from Molalla Avenue to Highway 213.
12. Establish a connection between Eckard and Cole on the south side of Molalla.
13. Examine possible transportation links with major highways and surrounding urban centers.

Many of the issues identified in this study still exist today. A map showing the location of these issues are presented later in this section.

Recent Transportation Studies for Private Development (1999)

Molalla Center Traffic Impact Study

A transportation impact study was conducted in April 1999 for a proposed 108,800-square-foot shopping center on Highway 211 across from the Dixon Avenue/Highway 211 intersection. Construction of the shopping center was expected to begin in 1999 and be complete by mid-2000. As part of the traffic impact study, the Highway 211/Highway 213, Highway 211/Dixon Avenue/site driveway, and Highway 211/Molalla Avenue intersections were evaluated.

The findings and recommendations of this traffic impact study are as follows:

- The proposed development is expected to generate approximately 7,154 daily trips with 660 of those trips occurring during the p.m. peak hour.
- A review of the total traffic volumes revealed that the Highway 211/Highway 213 intersection will continue to operate acceptably and that a traffic signal is not recommended.
- The Highway 211/Molalla Avenue intersection was found to operate acceptably under existing conditions. However, with the addition of site-generated traffic, the analysis revealed that it would fail at an unspecified future date. It was recommended that the intersection be monitored in the future to determine if signalization is needed.
- The intersection of Highway 211/Dixon Avenue was found to operate at an acceptable level of service under existing conditions. However, after full build-out of the site, this intersection would also fail at an unspecified future date. To mitigate the effects of the increased traffic, it was recommended that a traffic signal be installed at the intersection. In addition to the traffic signal, westbound and eastbound left-turn lanes were recommended for the left turning movements on Highway 211.

Molalla Retail Center Traffic Impact Study

A second transportation impact study investigated the traffic-related impacts of a retail center proposed for the northeast corner of the Highway 211/Highway 213 intersection. To be constructed in two phases, five buildings with a total floor area of 87,180 square feet will be located on the southern half of the site, with four more buildings located on the northern half of the site with a total floor area of 43,300 square feet. The study found that the Highway 211/Highway 213 intersection operates acceptably under existing conditions and will continue to do so in the future with build-out of the site. The driveways will also operate acceptably. The project will widen Highways 211 and 213 in the site vicinity to provide center turn lanes, and will also provide a sidewalk and bicycle lane along the site frontage.

TRANSPORTATION MODES AND FACILITIES

The City of Molalla's transportation system includes facilities for a variety of travel modes. These travel modes are identified and discussed in the following sections.

Pedestrian

The *City of Molalla Comprehensive Plan*, adopted in June of 1980, recognized the need to "...provide safe pedestrian access to schools, parks, and shopping to make walking a realistic alternative to driving within the city." In order to evaluate the adequacy of the existing pedestrian system and sidewalk network, city data on existing connections to pedestrian generators on Molalla roadways were reviewed. Pedestrian generators were defined to be existing facilities that typically attract high levels of pedestrian activity on a regular basis. Typical generators include schools and colleges, churches, parks, open spaces, shopping centers, cemeteries, libraries, municipal swimming pools, community centers, government offices, museums, historical landmarks, and downtown core districts.

At least one sidewalk connection should be provided between pedestrian generators and the areas where pedestrians are expected to originate in order to enhance the safety and attractiveness of pedestrian travel throughout the city. Sidewalks should also be integrated with transit stops and promote pedestrian circulation within neighborhoods. Sidewalks are particularly important on roadways characterized by high volumes and/or high speeds, because sidewalks can separate pedestrians from automobile traffic and improve their visibility to motorists.

Figure 3 identifies and describes existing sidewalks within the city. This figure shows that essential sidewalk connections are missing in some areas, particularly in residential areas located near schools, recreational facilities, and business centers. Fortunately, Molalla streets are laid out in grids and a strong base level of connectivity already exists in the street system. In most cases, improving the pedestrian network means providing sidewalks on streets where sidewalks currently do not exist, rather than developing entirely new pathway alignments.

The residential neighborhood west of Mathias Road and east of Cole Avenue has no internal sidewalks and no direct sidewalk connections to the athletic fields and high school campus west of Cole Avenue. The neighborhood west of the athletic fields and east of Molalla Avenue has no sidewalk connections to the athletic fields. Similarly, the neighborhood west of Molalla Avenue also has no internal sidewalks, nor does it have connections to the central business district, where destinations such as government buildings and businesses are located. Finally, the sidewalk network south and west of the north high school campus has inadequate connections to adjacent residential neighborhoods.



N
NOT TO SCALE

FIGURE
3

MOLALLA TRANSPORTATION SYSTEM PLAN

Existing Pedestrian Facilities

- Sidewalks
 - Both sides
 - Partial
 - No sidewalk
 - No Data
- Crosswalks
- City Limits

SOURCES:
City of Molalla (1997)
Add'l. field data collection



The residences north of Toliver Road have no direct sidewalk connections to the primary school south of Toliver Road, nor is there a sidewalk along Toliver Road in the vicinity of the school. Partial sidewalks exist elsewhere on Toliver Road between Highway 213 and Molalla Avenue. Insufficient connections exist between the grade school on Leroy Avenue and the neighborhood east of Leroy Avenue. In particular, there is no sidewalk on Leroy Avenue along the grade school frontage.

Sidewalks exist directly adjacent to the rodeo grounds and park, but these sidewalks do not extend into adjacent neighborhoods along Shirley Street and Fenton Avenue to promote easy neighborhood access. Two mid-block pedestrian crossings of Shirley Street adjacent to the rodeo grounds have neither pedestrian crossing nor advance pedestrian signing.

Figure 3 also shows areas of good sidewalk coverage. The central business district is sufficiently covered by the network of sidewalks. Pedestrian connections between the supermarket at Molalla Avenue and Robbins Street, the post office at Robbins Street and Grange Avenue, and downtown Molalla are numerous. Sidewalks in the newer residential developments north of Toliver Road and east of Molalla Avenue provide adequate internal pedestrian circulation and at least one good connection to a major roadway. This high level of neighborhood pedestrian facilities reflects city policies requiring new developments to provide adequate sidewalks.

Bicycle

The *City of Molalla Comprehensive Plan* found no bike paths within the city when the plan was adopted in 1980 and specified that city policies will “. . . encourage bicycle paths within the city to the greatest extent possible, funds permitting.” In order to evaluate the adequacy of the city transportation system in accommodating bicycle traffic, city data on the existing bicycle and street system were reviewed. Bicycle generators were defined to be places that typically attract high levels of bicycle activity. Bicycle generators within Molalla include the schools, recreational facilities, government offices, and businesses described for the pedestrian system. Bicycle facilities are adequate when short- and long-distance bicycle travel to and from bicycle generators is accommodated on safe and direct routes.

Figure 4 shows that no bicycle facilities are currently provided on nearly all of the main streets within the City. The only designated bicycle lanes are on Toliver Road between Hezzie and Molalla Avenue, and these lanes are provided only partially throughout most of this roadway segment. A bicycle path exists along the north side of Main Street (Highway 211) between Leroy and Shaver Avenues.

Bicycle lanes should be provided on main streets where automobile traffic speeds are significantly higher than bicycle speeds. Bicycle lanes should also connect residential neighborhoods to schools, the central business district, and the rodeo grounds. However, allowing bicycle traffic to mix with automobile traffic is acceptable where average daily traffic (ADT) is less than 3,000 vehicles per day, according to the *Oregon Bicycle and Pedestrian Plan* (Oregon Department of Transportation, June 1995). Therefore, roadways that carry over 3,000 vehicles per day and provide the required connectivity to bicycle generators are candidates for bicycle lanes. Such roadways include:

- Molalla Avenue (ADT of over 3,100 vehicles north of 7th Street)
- Main Street/Highway 211 (ADT of over 5,700 vehicles)
- Highway 213 (ADT of over 3,900 vehicles)

Some of these roadways are wide enough to accommodate a bicycle lane. All provide direct routes to points throughout the city.



FIGURE
4

MOLALLA TRANSPORTATION SYSTEM PLAN

Existing Bicycle Facilities

Bicycle Facilities

- Bike lanes, both sides
- Bike path
- Bike lanes, partial
- No bike facilities
- No data
- - - City Limits

SOURCES:
City of Molalla (1997)
Add'l. field data collection



Providing bike lanes on other streets would be appropriate where the volume of bicyclists is high, speeds are higher than 25 miles per hour, or poor sight distance exists. Areas proximate to schools, for example, may have high volumes of bicyclists. A bicycle lane may therefore be appropriate on a roadway such as Leroy Avenue. Other bicycle lanes may take the form of a multi-use path—which is shared with pedestrians—in areas where no street connection currently exists.

Public Transportation

Several operators, including the South Clackamas Transportation District and the Molalla School District, provide public transportation services within the City of Molalla. These operators are described in detail in the sections below.

South Clackamas Transportation District

Fixed-route public transit service is provided by the South Clackamas Transportation District (SCTD), once also known as Molalla Transit. At one time Molalla was served by Tri-Met, the transit service provider for the Portland metropolitan area, but withdrew from Tri-Met effective January 1, 1989 in order to obtain better service than was being provided. SCTD currently operates one more trip per day between Molalla and Oregon City than Tri-Met did, while assessing a local payroll tax approximately half of what Tri-Met currently assesses.

The SCTD encompasses an area of about 100 square miles, of which Molalla is only a small portion, albeit the portion with the greatest population concentration. Because state law does not allow the separation of mass transportation districts into non-contiguous pieces, the entire area south of Oregon City had to withdraw from Tri-Met, resulting in a much larger district than Wilsonville, which also withdrew from Tri-Met.

The SCTD owns two buses, a primary bus and a backup bus. The primary bus has 22 seats, plus two wheelchair securement areas that provide two additional seats each when not being used by wheelchairs. The backup bus has 16 seats, plus two wheelchair securement areas. Both buses are equipped with bicycle racks. SCTD staff report that the racks are well-used (especially by youths in summer) and consider them one of the best investments they have made. SCTD has applied for a state grant to replace the backup bus. SCTD does not employ any drivers, but rather contracts the service out.

SCTD operates 14 round trips per day on weekdays, approximately once an hour, between Molalla and Clackamas Community College in Oregon City, where connections can be made to Tri-Met. There is no weekend service. The first bus leaves Molalla City Hall at 5:06 a.m. and the last bus returns from Clackamas Community College at 8:00 p.m. Figure 4 shows the route traveled within Molalla and stop and shelter locations. (A second shelter, not shown on Figure 4, is located in front of the Senior Center on Kennell Avenue for use by senior center vehicles). Travel time from Molalla to Clackamas Community College is about 24 minutes; total travel time to downtown Portland is about 75 minutes during peak hours (via Tri-Met Route 99X) and about 90 minutes during off-peak hours (via Tri-Met Route 33). Schedules are coordinated with Tri-Met Route 33 at Clackamas Community College to minimize transfer times for passengers. SCTD also provides a shuttle service during the Molalla Buckaroo that circulates between the Buckaroo Grounds and other locations within the city.

Local transit funding is obtained from taxes on payrolls and self-employment income within the district, and from fares. The payroll tax was originally 0.5% (\$5 for every \$1,000), was lowered to 0.4% in 1994, and lowered again to 0.3% in 1999. For comparison, Tri-Met's 1999 rate was 0.6176%. Oregon law sets the maximum initial tax rate at 0.6%, but allows districts to increase the rate when areas withdraw from the district, so that the total amount of revenue generated before and after the withdrawal remains constant. Tri-Met's rate reflects the withdrawals of Molalla and Wilsonville from its service area.



NOT TO SCALE

FIGURE

5

MOLALLA TRANSPORTATION SYSTEM PLAN

Fixed-Route Transit

Bus Stops

- ▲ Bus stop
- Bus stop with shelter

Transit Service

- Transit route
- Street
- - - City Limits

SOURCES:
SCTD
Add'l. field data collection



SCTD has a fare of \$1 or one ticket, with no discounted child or senior fares, although each adult can bring one child under age 6 for free. Local schools purchase tickets for students to ride the bus (for example, to classes at Clackamas Community College), as do local employment and welfare agencies. The general public can also purchase tickets at the offices of the Molalla Telephone Company.

Average ridership is approximately 100 passengers per day and 2,100 per month. At the time SCTD withdrew from Tri-Met, about 60% of the passengers were commuters and 40% were traveling to Clackamas Community College. SCTD staff thought that this split was probably also representative of current conditions, but they do not track this information.

In terms of service enhancements, SCTD is currently looking at the feasibility of circulator bus service within the City of Molalla; staff feels that this is likely the first improvement that will be made. There are some requests for Saturday service, but none for Sunday service. Service to Canby could be considered in the future, and while Silverton has requested connecting service, SCTD staff does not believe there is sufficient passenger demand to justify a route.

There have been no requests for additional shelters beyond the existing shelters at City Hall and the Senior Center, although SCTD staff has talked to the developer of the shopping center at the Highway 211/Highway 213 intersection about providing a shelter on site. Parking is available behind City Hall and staff feels that there is no need at this time for additional park-and-rides to serve regular transit service. However, staff feels that a park-and-ride lot outside the City could be useful during the Buckaroo to reduce traffic within Molalla, with a shuttle running between the lot and the Buckaroo Grounds.

Special Needs Transportation

SCTD does not provide special needs transportation, other than the service it is required to provide under the Americans with Disabilities Act (ADA). The ADA requires that passengers within $\frac{3}{4}$ mile of the fixed route, who are not able to travel to a bus stop due to a disability, be picked up and dropped off at their door. ADA service is infrequently used, according to staff.

Special needs transportation providers include the following. Medical transportation to and from doctor's appointments for eligible residents of Molalla is provided under contract by Sassy's Cab. The Molalla Senior Center operates vehicles that bring local seniors to events occurring at the Senior Center. Clackamas County provides the Transportation Reaching People (TRP) Program, which provides volunteer drivers for eligible passengers. To be eligible, a person must be a resident of Clackamas County who is unable to receive assistance from other transportation resources, and who is 60 years of age or older, physically or mentally disabled, or a resident of a rural area. Transportation is usually available weekdays between 8 a.m. and 5 p.m., with limited service sometimes available evenings and weekends.

School Buses

School buses are a form of public transportation, although a form that is sometimes overlooked. The Molalla School District operates buses throughout Molalla and nearby areas, taking children to and from the schools located around the City. The school bus yard is located off of Toliver Road, east of Highway 213. The school district declined to provide information about the routing of its buses, so this TSP is unable to identify specific issues associated with school bus travel within Molalla.

Performance

The 1992 Oregon Transportation Plan identifies the following minimum levels of service for intercity passenger services that are relevant to Molalla:

- Local public transit services and elderly and disadvantaged service providers should regularly connect with passenger services
- Services shall be provided in compliance with the Americans with Disabilities Act (ADA) requirements for all modes and transfer facilities
- For cities with a population over 2,500 located 20 miles or more from the nearest Oregon city with a larger population and economy, service should allow a round trip to be made within a day (the ODOT Public Transit Section expands this to mean service between 6 a.m. and 10 p.m. and a gap of at least 3 hours between arrival and departure to allow time for errands and appointments)
- Local transit and elderly and disadvantaged service should be coordinated with intercity bus services

A recent evaluation by the ODOT Public Transit Section found that Molalla currently meets all of these goals. For cities under 25,000 population, there is no statewide goal for providing transit service, although some cities in this category do provide service (for example, Woodburn and Silverton).

The *Transit Capacity and Quality of Service Manual*, recently published by the Transportation Research Board, provides a means of assessing the quality of service provided from a passenger's point of view. Service quality is measured by *levels of service* (LOS), which categorize values of key performance measures using an "A" (best) to "F" (worst) letter grade. Quality of service measures relevant to Molalla include the following:

- **Intercity service frequency:** This measure is based on trips per day. The existing service operates at LOS B (12-15 trips/day), which means that the service provides a great variety of travel time options for passengers and minimizes waiting time between successive trips.
- **Passenger loading:** Existing service provides a seat for every passenger, so all trips operate at LOS C or better, maximizing passenger comfort.
- **Transit/auto travel time:** This measure is based on the comparative door-to-door travel times by transit and by the automobile. Based on conversations with SCTD staff, the primary destinations of transit users are Clackamas Community College and downtown Portland. It was assumed that users walk an average of eight minutes to a transit stop (longer than typical because the bus route travels along the edges of Molalla) and wait an average of five minutes for the bus. It was also assumed that motorists spend three minutes parking and walking at the college and five minutes parking and walking downtown. To the college, the travel time difference is approximately 17 minutes (LOS C), indicating that transit is competitive with the automobile for this trip. To downtown Portland, the travel time differences are approximately 33 minutes during peak periods (LOS D) and 58 minutes during off-peak periods (LOS E). Transit may be used by some choice riders for commutes to downtown Portland, but will be unattractive to choice riders for travel to downtown Portland at other times.

Routing the bus through neighborhoods, rather than along the state highways, would reduce walking distances to transit from many residential areas, although bus travel time through Molalla would also increase somewhat, because lower-speed streets would be used. The present routing forces passengers not boarding at City Hall to cross Highways 211 or 213—the two busiest roadways in the City—at some point in their trip to access transit, which may be uncomfortable for potential users. The lack of sidewalks and curb cuts in many areas also makes it difficult for persons with disabilities to access transit. However, the generally poor pavement condition along Toliver Road currently acts as a constraint to potential route changes.

Rail

Rail service to Molalla is provided by the Oregon Pacific Railroad (formerly the Molalla Western Railroad), a short-line operator headquartered in Portland. Molalla lies at the end of a 10.2-mile branch line that leaves the Union Pacific mainline in Canby. The tracks currently end just north of Main Street, but used to extend south as far as 7th Street. According to railroad staff, these tracks were removed because they were not serving any customers and the railroad desired to eliminate the cost of maintaining the Main Street grade crossing. However, the railroad would be willing to replace the tracks and crossing if a customer were found in that area. Two grade crossings remain in Molalla, at Toliver Road and Vick Road. Figure 6 shows the location of the rail line serving Molalla.

The tracks are classified as “excepted track,” which is the lowest level of track classification. Passenger trains are not allowed on excepted track and freight trains are limited to 10 mph. This line also has a weight restriction of 240,000 pounds per four-axle car.

The railroad currently has no customers in Molalla and this portion of the line is used only for leased storage of empty boxcars. Since there is a shortage of tracks in the region on which to store rail cars, this activity produces some revenue for the railroad. In the past, the line has mainly carried lumber products, but has also carried farm chemicals, feed grain, and plastic pellets.

Land adjacent to the tracks in Molalla is zoned for industrial use, to take advantage of the presence of the railroad tracks. Another area of industrial-zoned land is located south of where the tracks used to end, along the north side of the Molalla Forest Road.

The nearest passenger rail service is located in Portland and Salem and is operated by AMTRAK. From Portland, service is provided four times daily north to Seattle (with service partially funded by Washington State), with next-day connections to and from Vancouver, B.C.; and east once a day to Chicago via Spokane, Fargo, and Minneapolis. Service is provided south once a day from Portland and Salem to Sacramento, Oakland/San Francisco, and Los Angeles. One additional rail trip per day and three bus trips per day have been provided between Portland and Eugene, with stops in Salem and Albany. However, these trips have been partially funded by Oregon and the funding authorization ended on June 30, 1999. AMTRAK has announced that it will continue all but one of these trips for the time being, but if the Oregon Legislature does not appropriate continuing funding this session, the service may be terminated.

Oregon has studied the possibility of implementing high-speed rail between Eugene and Portland, continuing future high-speed service from Vancouver, B.C. and Seattle. To date, the Oregon Legislature has been much less willing than Washington’s to appropriate funds to develop this service. The recent passage of Initiative 695 in Washington has resulted in substantial cuts in transportation funding, including the high-speed rail program. If high-speed service is eventually implemented, the trains would stop at the same stations as the current AMTRAK service and thus would be no more convenient to Molalla than existing service.

There have been two recent studies of possible commuter rail service in the northern Willamette Valley; however, neither has looked at the Salem-Portland Union Pacific corridor as a potential line. Canby, located 11 miles from Molalla, would likely be the closest station location to Molalla if such a line were ever to be developed.



FIGURE

6

MOLALLA TRANSPORTATION SYSTEM PLAN

Existing Railroad Facilities

Railroad

- - - Active
- - - Not in use
- - - City Limits

SOURCES:
 ODOT
 Oregon Pacific Railroad



Performance

The following goals from the 1992 Oregon Transportation Plan are relevant to Molalla:

- Branch rail lines within Oregon should be maintained to allow a minimum speed of operation of 25 miles per hour whenever upgrading can be achieved with a favorable benefit-cost ratio.
- Priority rights of way should be preserved for potential public use or ownership when abandonment proceedings are initiated (e.g., corridors where there are future alternative uses, especially near expanding urban areas).

As excepted track, the Oregon Pacific Railroad line serving Molalla does not meet the 25 mph goal. Indeed, the track classification indicates that the track is in very poor condition, which increases the likelihood of derailments. However, due to the lack of customers in Molalla, it would not appear to be economic to upgrade the track at this point in time. Freight moved by rail is often relatively time-insensitive; the 36-minute savings that could be achieved by upgrading the entire line to allow 25-mph freight operating speeds would probably not be a sufficient incentive for a shipper to change modes.

Air

There are no airports located within the City of Molalla; however, a public general aviation airport is located approximately 5 miles north in Mulino. The Mulino Airport is owned by the Port of Portland. It has one paved 3,600-foot runway and serves approximately 20,000 aircraft operations (takeoffs or landings) annually. A fixed-base operator is located at the airport to provide services for general aviation aircraft.

A second airport is located approximately two miles west of the Highway 211/Highway 213 intersection, outside the Molalla UGB. The Skydive Oregon (formerly Hutchinson) Airport is owned and operated by Skydive Oregon, a parachute jumping operation. The airport has one paved 2,400-foot runway and has 10-90 daily operations. Approximately 50% of the operations are skydive-related. Approximately 15 aircraft are based at the airport.

The closest airport with scheduled passenger service is Portland International Airport, located approximately 35 miles north of Molalla.

Performance

None of the level of service goals for air service contained in the 1992 Oregon Transportation Plan apply to Molalla. However, general aviation facilities are located nearby and a major international airport is located within one hour's drive, so it can be said that Molalla has good access to the air mode for a city of its size.

Marine

No navigable waterways are located in the vicinity of Molalla.

Pipeline and Transmission System

Power Transmission System

The Bonneville Power Administration (BPA) is the federal organization that regulates and distributes power throughout the Pacific Northwest. Columbia River hydroelectric sources provide 67 percent of BPA's power. The rest comes from coal mines, the Hanford nuclear plant in Washington, cogeneration,

and non-utility sources such as privately owned windmills. There are no BPA transmission lines or substations in Molalla. The nearest transmission line is located approximately eight miles to the west.

Portland General Electric (PGE) provides electric power to the Portland metropolitan area from eight hydroelectric plants (on the Willamette, Clackamas, Deschutes, and Bull Run Rivers) and six thermal plants (in Oregon, Washington, and Montana) with a total power generation capacity of 2,022 megawatts. Its service area covers 3,170 square miles and 45 percent of Oregon's population. As of December 1998, PGE system reliability is calculated to be 99.98 percent. In Molalla, a PGE transmission line runs south along Highway 213 into the existing Old Molalla substation—from which distribution lines radiate out into the city—and then to Mount Angel. This substation is to be demolished in the near-term future as the recently constructed New Molalla substation begins operation. Both substations are located southwest of the city.

Natural Gas

The utility that provides natural gas throughout the Pacific Northwest is Northwest Natural Gas (NNG). NNG obtains its natural gas from the Northwest Pipeline, owned by Williams Gas Pipeline, via NNG gate stations and high-pressure transmission lines. Surplus natural gas is purchased in the summer, when demand and prices are low, to supplement the winter supply.

No gate stations, high-pressure transmission lines, or storage facilities are currently located within Molalla, nor are new ones planned for the area. The nearest high-pressure transmission line runs between Oregon City and Salem. Natural gas is transmitted to Molalla from the high-pressure line via smaller mains. There are no natural gas supply restrictions in Molalla because the compressibility of natural gas means that pipeline capacities are highly variable. Molalla residents who live on a street where a natural gas distribution line already exists can be easily connected to that distribution line.

Water

Molalla operates its own water system and treatment plant. The water source for the city is the Molalla River. Two reservoirs are located at the treatment plant southeast of the city, and one main line carries treated water to the city along Adams Cemetery Road, Freyrer Park Road, and 5th Street to the athletic fields. The city recently expanded the capacity of its entire distribution system from two million gallons per day to four million gallons per day to accommodate increased demand.

Truck Freight Transportation

Main Street (Highway 211), Molalla Avenue, and Freyrer Park Road/Mathias Avenue are the main truck routes within Molalla, with Highway 213 on the western edge of the city also serving truck movements. The volume of trucks passing through downtown Molalla, as well as the difficulty some trucks experience making turns at the Molalla Avenue/Main Street intersection, have been raised as issues in the past.

The primary types of trucks passing through the City are log trucks and gravel trucks coming from areas south and east of the City. The City has purchased the Molalla Forest Road, a once-private road that served as a route for log trucks around the south and western edges of the city, with the intent of one day rehabilitating the road and opening it as a truck bypass around downtown Molalla. Constraints to implementing this plan include the cost of improving the road, restrictions on creating new roads outside a city's urban growth boundary, and residential developments along some of the roads leading to the proposed bypass.

Clackamas County limits trucks on certain roads and bridges in the Molalla area. Trucks over 60 feet long are prohibited on most east-west roads south of Molalla, including Dart, Thomas, Wildcat, Leabo, and

Maple Grove. A 38-ton weight limit exists on the Freyrer Park Road bridge over the Molalla River east of Molalla. The restrictions south of Molalla, in particular, mean that any truck trips originating in this area must pass through Molalla to access a state highway.

Roadways

Ownership and Functional Classification

Figure 7 shows the ownership of roads around Molalla—state, county, or city. The jurisdiction owning a particular road sets the policies that determine the roadway’s functional classification, described below, and is the jurisdiction responsible for maintaining the road. The Oregon Department of Transportation owns the two highest-volume roadways within the City, Highways 211 and 213. Clackamas County owns almost all of the remaining public roads outside the City, as well as several important roads inside the City, including Molalla Avenue, Toliver Road, Mathias Avenue, and Freyrer Park Road. The City owns the remaining public roads within the city limits, as well as portions of Molalla Forest Road lying outside the urban growth boundary. Typically, once an area is annexed into a city, the local county roads within the annexed area are transferred to the city, subject to the county bringing the roads up to city standards, if necessary.

A roadway’s *functional classification* determines its role in the transportation system, as well as its width, right-of-way dedications, driveway (access) spacing requirements, types of pedestrian and bicycle facilities provided, and so on. Within the Molalla area, *arterials* represent the highest class of roadway. Arterial roadways are intended to serve higher volumes of traffic, particularly through traffic, and tend to emphasize traffic movement over local land access. At the other end of the scale, *local streets* provide access to individual parcels and are not intended to carry high volumes of traffic, nor through traffic. *Collector* streets serve a collection and distribution role, gathering traffic from local streets and taking them to arterial streets. Collector streets carry moderate traffic volumes and also serve a local land access function. Molalla also designates some streets as *minor* streets; in other jurisdictions, these are often known as minor collectors. These kinds of streets serve a smaller number of local streets than major collectors (which are equivalent to Molalla’s collector streets) and serve to carry traffic to other collector streets or to arterials. Figure 8 shows the functional classifications of roadways in and near Molalla.

ODOT has created an additional roadway hierarchy among its state highways. In decreasing order of importance, roadways are classified as Interstate, Statewide, Regional, or District level of importance, depending on a highway’s role in moving traffic around the state. Both Highways 211 and 213 are District level highways, meaning that they primarily serve traffic movements within a relatively small portion of the state.

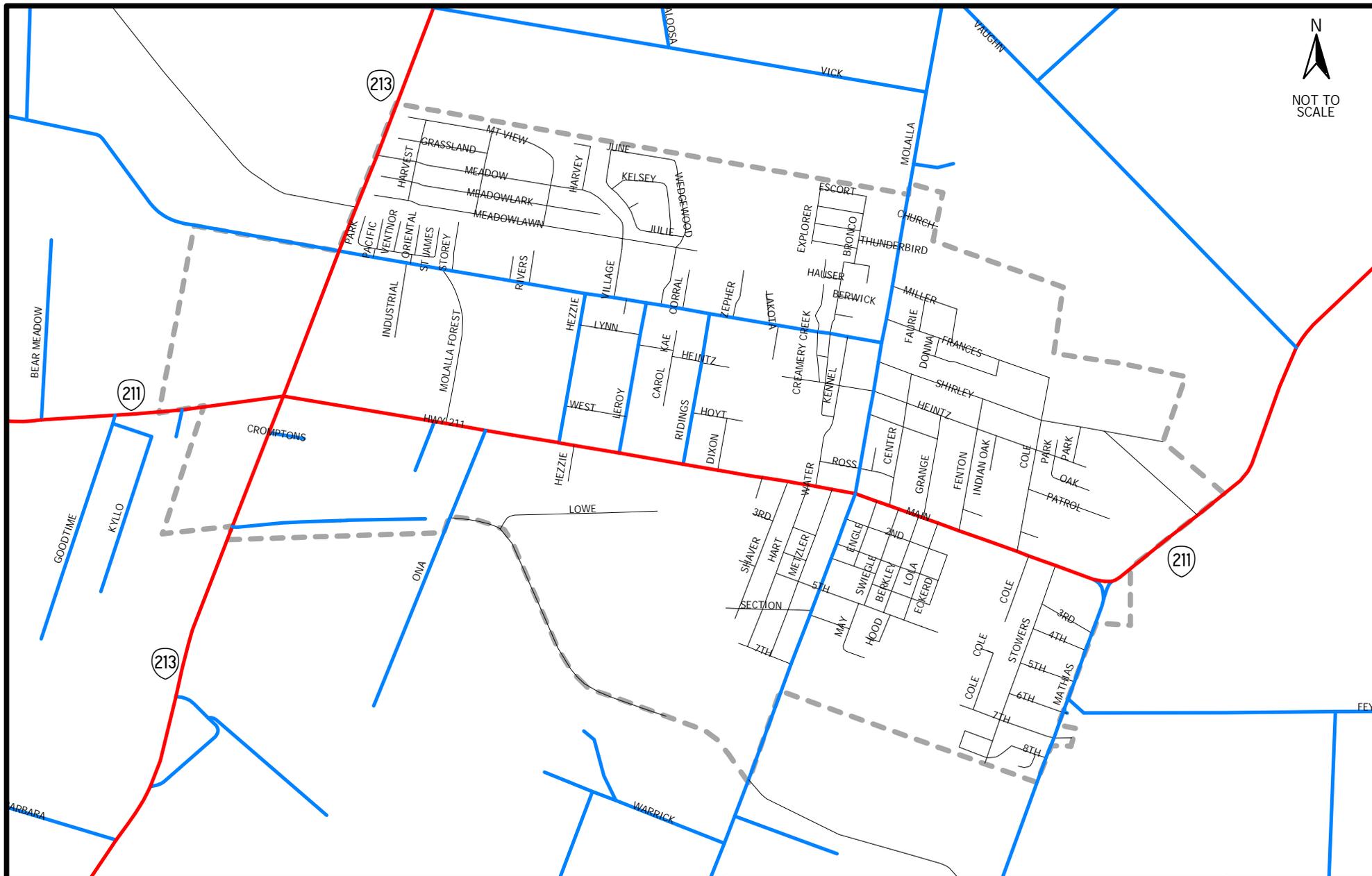
Pavement Conditions

The public’s investment in roadway infrastructure is considerable and it is important to continually maintain roadways in order to protect that investment. The City of Molalla conducted a pavement conditions inventory in 1997, which was supplemented by a follow-up survey by the TSP project team in 1999 on some of the more important roadways in the City. Pavement conditions on state highways were obtained from ODOT, with 1998 conditions being the most recent data available.

Pavement conditions were rated on a good-fair-poor basis. The goal of a jurisdiction should be to keep as much of its roadways in “fair or better” condition as possible, as ODOT reports that it costs five times as much to repair a roadway in poor condition than one in fair condition. This represents the difference between resurfacing the roadway and completely reconstructing the roadway, including its base. Roadways in *good* condition have few pavement defects and provide a smooth ride to motorists.

Roadways in *fair* condition have some defects, such as cracking, minor rutting, and patching, but are in generally satisfactory shape. These roadways provide a noticeably bumpier ride to motorists. Roadways in *poor* condition have numerous and/or severe defects, such as large sections of alligator cracking and deep ruts, and provide an uncomfortable ride for motorists.

Figure 9 presents pavement conditions within Molalla. Most of the local street system is in fair-or-better condition, as is most of Main Street and Highway 213. Toliver Road has the largest section of poor pavement, followed by Shirley Street. A few blocks of Molalla Avenue are in poor condition, with most of the rest of the roadway within the city limits in fair condition. Highway 211 west of Highway 213 was rated by ODOT as being in poor condition in 1998. The state has since resurfaced portions of the road as a temporary measure to improve ride quality, but it would be expected that the underlying pavement defects will reappear within a year or two.



FIGURE

7

MOLALLA TRANSPORTATION SYSTEM PLAN

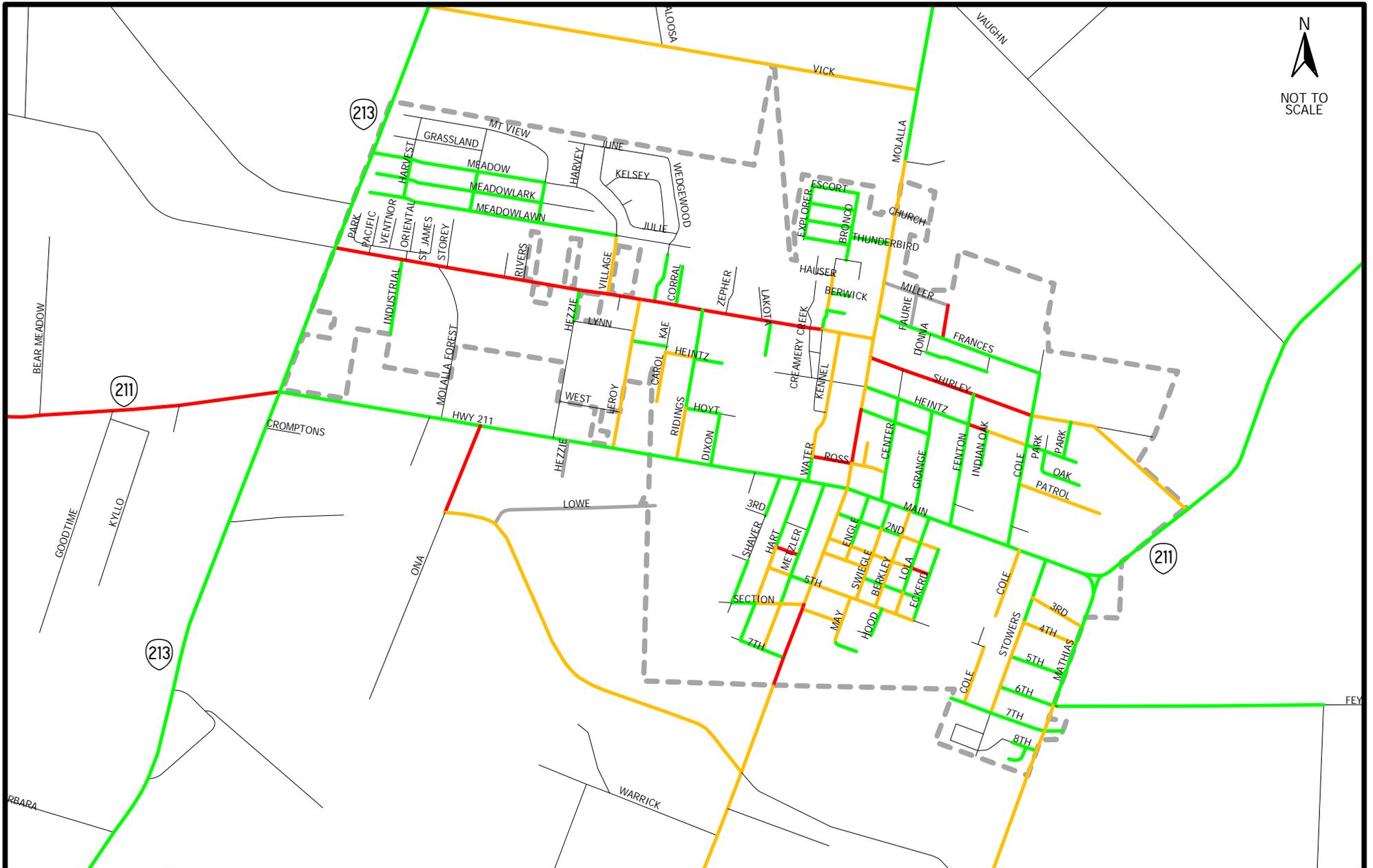
Road Ownership

Road Owner

- City
- County
- State
- - - Urban Growth Boundary

SOURCES:
ODOT
Clackamas County





FIGURE

9

MOLALLA TRANSPORTATION SYSTEM PLAN

Existing Pavement Conditions

Pavement Conditions

- Good
- Fair
- Poor
- Gravel
- No Data
- City Limits

SOURCES:
 City of Molalla (1997)
 ODOT (1998)
 Add'l. field data collection



Traffic Volumes

Intersection Operations

The Molalla TSP project team, working with City staff, identified several intersections to be analyzed for traffic operations, shown in Figure 10. The study intersections are:

- Highway 211/Highway 213;
- Highway 211/Mathias Road;
- Highway 211/Molalla Avenue;
- Molalla Avenue/Heintz Street;
- Molalla Avenue/Toliver Road;
- Leroy Avenue/Highway 211; and
- Toliver Road/Highway 213.

The weekday p.m. peak period (4-6 p.m.) is when traffic volumes are highest on the roadways in Molalla and therefore was chosen as the study time period. Weekday p.m. peak hour counts were conducted at the study intersections by the City of Molalla staff in June, prior to the end of the school year (i.e., before most people would tend to leave for summer vacations).

Traffic engineers describe how well an intersection operates using “levels of service” (LOS), representing ranges in the amount of delay that motorists experience when passing through the intersection. Levels of service range from “A” (best) to “F” (worst). For unsignalized intersections, LOS “E” or better is generally considered to be acceptable, representing 45 seconds or less of delay to motorists. (For all-way stop intersections, “delay” represents the average delay experienced by all motorists using the intersection, while for two-way stop intersections, it represents the average delay of the worst movement, typically a left turn from the stop-controlled street.) ODOT uses a different criterion for intersections under its jurisdiction, based on the percent of the intersection’s capacity that has been used up. For state highway intersections within Molalla, ODOT considers operations to be acceptable when the intersection (or its critical movement) operates at 85% of its capacity or less.

Level-of-service (LOS) analyses were conducted at the study intersections to determine how well each intersection is operating, using the procedures stated in the *1994 Highway Capacity Manual*. All of the study intersections are unsignalized. The Highway 211/Highway 213 and Highway 211/Molalla Avenue intersections are all-way stop-controlled and the remaining study intersections are two-way stop-controlled. Levels of service at the study intersections are shown in Table 2.



FIGURE

10

MOLALLA TRANSPORTATION SYSTEM PLAN

Existing Intersection Levels of Service

Level of Service

- A-C
- D-E
- F
- Streets
- - - City Limits



Table 2
Existing Levels of Service, Weekday P.M. Peak Hour

Intersection	Two-Way Stop				All-Way Stop		
	Critical Approach	Critical V/C	Movement Delay (sec)	Movement LOS	V/C	Avg. Delay (sec)	LOS
Highway 211/Highway 213					0.75	12.1	C
Highway 211/Mathias Road	NB-LT	0.26	9.6	B			
Highway 211/Molalla Avenue					0.77	13.3	C
Molalla Avenue/Heintz Street	WB	0.24	9.8	B			
Molalla Avenue/Tolliver Road	EB	0.16	5.0	A			
Leroy Avenue/Highway 211	SB	0.13	10.6	C			
Tolliver Road/Highway 213	SB	0.09	7.8	B			

v/c = volume-to-capacity ratio, LOS = level of service, NB = northbound, SB = southbound, EB = eastbound, WB = westbound, LT = left turn

As shown in Table 2, all of the study intersections currently operate acceptably, with reasonable delay for motorists and adequate capacity.

Daily Roadway Volumes

Average daily traffic volumes for many of the more important roadways in Molalla have been gathered and are shown in Figure 11. The data are from 24-hour roadway tube counts, manual turning movement counts at intersections, and the Oregon Department of Transportation's 1997 *Traffic Volume Tables*. The traffic volume data show that the major roadways serving Molalla are Highway 213, Highway 211, and Molalla Avenue.

Traffic Safety

Crash History

To determine if any safety deficiencies or potential conflict points exist on the roadways or major intersections, crash data for the City of Molalla were examined. The data for the study intersections were obtained from ODOT for the period January 1, 1994 through December 31, 1998. A summary of the intersection crash data is shown in Table 3.

Table 3
Intersection Crash Analysis

Intersections	Crash Type			Total Crashes	Crash Rate
	PDO	People Injured	Fatalities		
Highway 211/Highway 213	1	3	0	4	0.17
Highway 211/Mathias Road	0	0	0	0	0.00
Highway 211/Molalla Avenue	2	2	0	4	0.28
Molalla Avenue/Heintz Street	6	13	0	11	0.48
Molalla Avenue/Tolliver Road	2	0	0	2	0.14
Leroy Avenue/Highway 211	1	0	0	1	0.07
Tolliver Road/Highway 213	2	2	0	4	0.23
Highway 211/Highway 213	1	5	0	5	0.40

PDO = property damage only
 Crash Rate is crashes per million entering vehicles (MEV)



FIGURE
11

MOLALLA TRANSPORTATION SYSTEM PLAN

Average Daily Traffic Volumes



SOURCES:
ODOT (1997)
Clackamas County (1995)
Intersection counts (1999)



Crash rates for intersections are expressed in crashes per million entering vehicles (MEV). As a rule of thumb, crash rates higher than 1.0 crashes/MEV indicate locations where safety deficiencies may exist and warrant further investigation. As shown in Table 3, all study intersections have relatively low crash rates. A further review of the data did not reveal any particular crash patterns at the study intersections.

Another way to assess intersection crash history is using the Safety Priority Indexing System (SPIS), which weights the number of crashes and their severity to prioritize safety improvements. 1996 Metro data indicate that the Highway 211/Highway 213 intersection and Highway 211 near the former railroad crossing were in the top 20% of SPIS locations in rural Clackamas County.

Data from the Rural Clackamas County TSP were utilized to obtain road segment crash rates along the study area roadways. Metro collected 1996 roadway crash rates (reported as crashes per million vehicle miles traveled) and grouped them into five ranges of rates. These ranges are summarized in Table 4. Reported percentiles compare the roadway segment's crash rate to that of rural Clackamas County (including rural cities) as a whole.

**Table 4
 Roadway Segment Crash Rates**

Roadway Segment	Urban/Rural	Crashes Per Million Vehicle Miles Traveled
Highway 213 from Molalla Avenue southward	Rural	0.69-1.18 (Lowest 40%)
Highway 213 from Molalla Avenue to Toliver Road	Urban	1.67-2.57 (Highest 40%)
Highway 213 from Toliver Road to Barnards Road	Rural	1.19-1.66 (Highest 60%)
Highway 211 from Highway 213 to Molalla Avenue	Urban	1.19-1.66 (Highest 60%)
Highway 211 from Molalla Avenue to Mathias Road	Urban	1.67-2.57 (Highest 40%)
Highway 211 from Mathias Road to Macksburg Road	Rural	1.19-1.66 (Highest 60%)
Molalla Avenue from Highway 211 to Highway 213	Both	1.19-1.66 (Highest 60%)
Mathias Road from Highway 211 to Eves Road	Both	0.00-0.68 (Lowest 20%)
Eves Road from Mathias Road to Sawtell Road	Rural	0.00-0.68 (Lowest 20%)

For comparison, ODOT reported a 1996 statewide average crash rate on rural secondary highways (such as Highways 211 and 213) of 1.26 accidents per million vehicle miles. Urban secondary highways (such as downtown Molalla) had an average crash rate of 3.10 accidents per million vehicle miles. All of the urban highway segments are below the state average crash rate. Highway 213 north of Molalla to Liberal, Molalla Avenue, and Highway 211 east of Molalla are above the state average crash rate, but have average crash rates when compared to other roadways in rural Clackamas County.

Geometric and Safety Deficiencies

In addition to the accident analysis, Metro data and field observations conducted by the project team were used to identify locations with safety or geometric problems. These problems include inadequate shoulder width, inadequate roadway width, poor sight distance, and unusual intersection design. Figure 12 identifies these locations and the type of problem at each location.

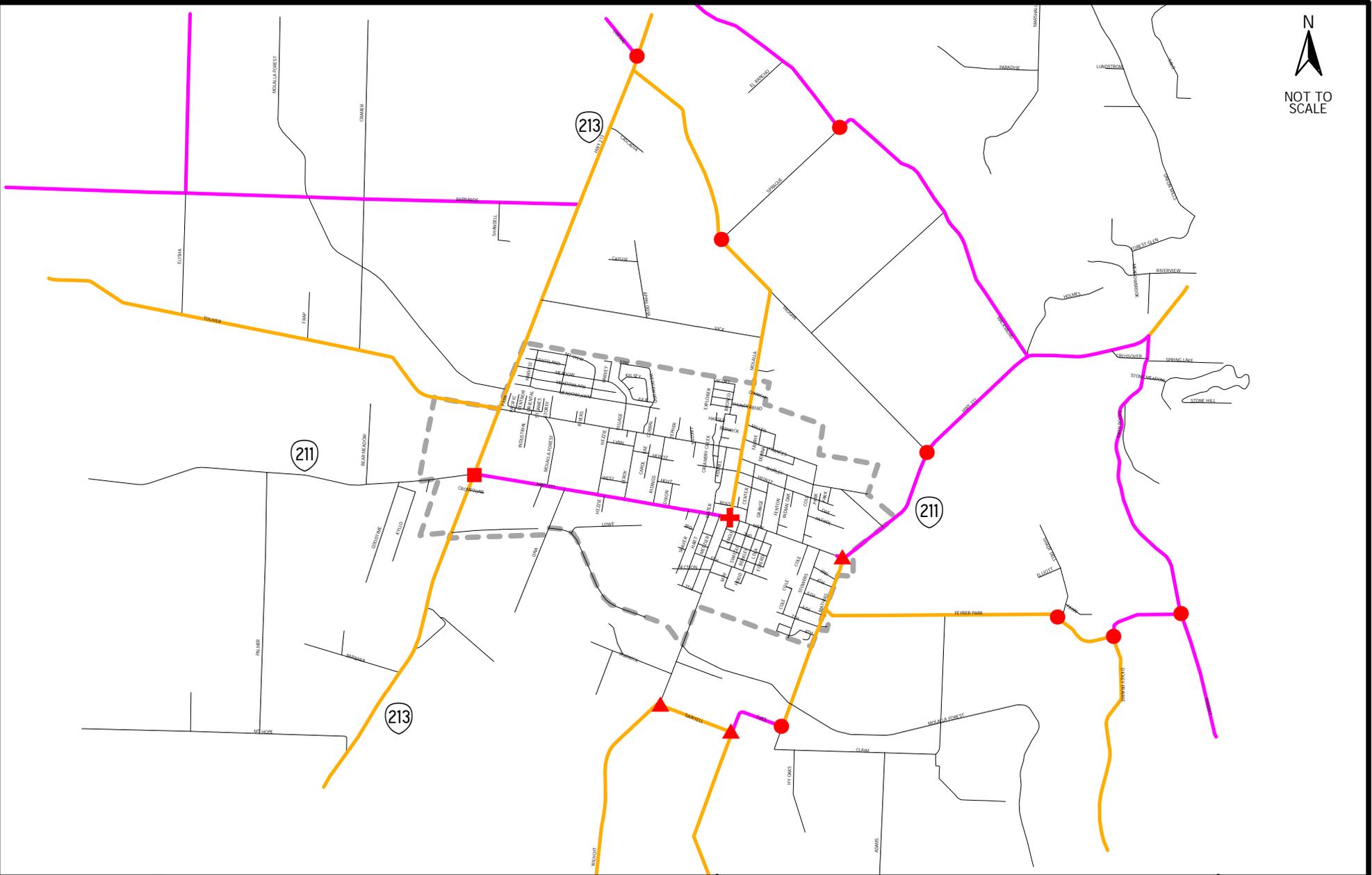


FIGURE
12

MOLALLA TRANSPORTATION SYSTEM PLAN

Safety & Geometry Issue Locations

- Intersection Issue**
- Sight distance
 - ▲ Unusual geometry
 - Vertical alignment
 - ⊕ Truck turning

- Width Deficiencies**
- Lane and shoulder
 - Shoulder only
 - No reported deficiency
 - - - Urban Growth Boundary

SOURCES: Metro, add'l. field data collection



SUMMARY OF EXISTING CONDITIONS

The following is a summary of the current condition of the transportation modes serving Molalla:

- **Pedestrian:** The downtown area and new developments have good pedestrian facilities and connectivity, while other areas of the City lack a number of essential connections between centers of pedestrian activity.
- **Bicycle:** Few roadways have bicycle facilities; however, traffic volumes on most streets are low enough that bicycles can safely mix with automotive traffic. Molalla Avenue north of downtown and portions of Main Street are the primary areas to address.
- **Transit:** SCTD provides excellent levels of weekday intercity service to Clackamas Community College, where connections can be made to Tri-Met. Weekend service and general public transit service within Molalla are not currently available. Pedestrian connections to bus stops are often lacking and the bus routing should be evaluated to see if service can be brought closer to residential areas, to minimize walking distance and avoid the need to cross busy highways. Services for special needs passengers are provided in Molalla.
- **Rail:** No customers currently exist for the Oregon Pacific line serving Molalla and track conditions limit operations to freight only, traveling at speeds of 10 mph or less. Industrial-zoned land abuts the rail line, providing opportunities for potential customers to locate next to rail service. The closest passenger rail stations are located in Portland and Salem.
- **Air:** Molalla is served by a public general-aviation airport five miles north in Mulino and a private airport four miles west. The closest airport with scheduled passenger service is Portland International Airport.
- **Marine:** No navigable waterways are located in the vicinity of Molalla.
- **Pipelines and Transmission Systems:** Electric transmission lines, natural gas distribution lines, and water lines serve the City.
- **Truck Freight Movement:** Log and gravel trucks pass through the downtown area. Truck turning difficulties at the Main Street/Molalla Avenue intersection have been identified.

Roadways: All major intersections within the City operate at acceptable levels of service. Safety and geometric issues have been identified at a number of locations within and near the City. Pavement conditions are poor on Toliver Road and sections of Shirley Street and Molalla Avenue. Crash rates at intersections and on road segments are generally near or below state and county averages.

Section 3

Future Conditions Analysis

Future Conditions Analysis

INTRODUCTION

This section presents the forecast population growth in Molalla through the year 2020 and the transportation needs that will result if nothing is done to improve the City's transportation system in the meantime.

The population growth experienced by Molalla in the recent past is expected to continue into the future, based on the City's projections and the continued growth of the Portland area in general. By the year 2019, a total of 13,370 people are expected to call Molalla home, compared to the City's current population of about 5,400. This growth will require approximately 310 additional acres of land to be converted to residential uses, over and above the undeveloped residential land currently identified in the City's land use plan. Because this forecast growth over the next 20 years is expected to exceed what can be accommodated by the remaining undeveloped residential land provided within the City, this section also evaluates two alternative land use scenarios that explore the potential transportation impacts of hypothetical urban growth boundary (UGB) expansions.

Under the first land use scenario, the new residential land is assumed to come from a combination of an urban growth boundary (UGB) expansion north to Vick Road and the conversion of undeveloped industrial-zoned land within the current UGB to residential uses. Under the second land use scenario, the new residential land is assumed to come entirely from UGB expansions, particularly in the southeast, northeast, and north central portions of the City.

POPULATION FORECASTS

In order to estimate future transportation system demand, a relatively accurate forecast of future population is required. Both the Oregon Department of Labor and the Center for Population Research and Census at Portland State University (PSU) provide projections at a county-wide level, but not at a city-wide level. Since Molalla has a small population relative to the total 1998 Clackamas County population of approximately 323,600 and since much of the County's population lies within the Portland metropolitan area, county-wide data are not particularly applicable to Molalla.

Metro, the regional planning agency for the Portland metropolitan area, prepared a regional population forecast in 1998 for use in its regional transportation-planning model. Metro's data gave a 1994 population for Molalla of 3,915 and projected a 2017 population of 4,251, an increase of only 8% over 20 years. Given that Molalla's 1998 population was estimated by PSU to be 5,395 and given the City's growing role as a bedroom community for Portland, Metro's projections for Molalla appear to be unrealistically low.

Based on discussions with City staff, the population forecast that was recently used to develop systems development charges (SDCs) for the City will also be used for developing population forecasts for the transportation system plan. The SDC report forecast Molalla's population in the year 2019 to be approximately 13,370. This figure was based on a projection of 2,784 new dwelling units and an average dwelling rate of 2.74 persons per household. This growth forecast represents a population increase of 168% over the next twenty years.

VACANT LANDS INVENTORY

A vacant lands inventory was used to estimate the amount of undeveloped or underdeveloped residential land remaining within the Molalla Urban Growth Boundary. The City of Molalla’s Comprehensive Plan currently has three residential land use designations: R1, R2, and R3. The R1 zone (single family residential) is designed to accommodate low-density single family dwelling units on moderately sized lots. Standards allow between 4.3 and 5.8 dwelling units per acre with minimum lot areas of 6,300 square feet. R2 (two-family residential) is a medium density land use designation that allows a mix of single family dwellings and duplexes. Standards allow between 4.9 and 9.8 dwelling units per acre with minimum lot sizes of 6,300 square feet for single family dwellings and 7,500 square feet for duplexes. R3 (multi-family residential) is a high-density land use designation consisting of multi-family apartment complexes. Standards allow between 15 to 18 dwelling units per acre, with minimum lot sizes of 5,400 square feet plus 1,500 square feet for each dwelling unit in excess of one. Figures 13 and 14 identify the locations of areas designated for residential uses in the City’s zoning code and land use plan.

Using the City’s land use plan and the standards outlined above, the future year build-out capacity was estimated for each land use designation. This build-out capacity was determined for each of the three land use designations through an analysis of aerial photographs. Net developable acreage was calculated by reducing gross acreage by 33% to account for both undevelopable land and for land used for streets and other uses. Table 5 outlines these findings.

**Table 5
 Vacant Residential Land Inventory**

Land Use Designation	Available Net Acreage
R1	126.0
R2	13.4
R3	18.1

Based on the minimum lot size standards for each land use designation and the developable residential acreage in Molalla, the build-out capacity was calculated. It was found that Molalla can accommodate approximately 867 additional single family residential units, 100 two-family residential units, and 271 multi-family residential units within the current UGB and land use plan.

To get a population for Molalla at build-out of the residential area within the Molalla UGB, an average persons per household figure of 2.96 was utilized (source: Metro). Applying this figure to the build-out capacity numbers, Molalla can expect a total build-out population increase of 3,447 people. Table 6 shows 1998 and build-out population figures.

**Table 6
 Build-Out Population**

	Population		Total Percent Growth
	1998	Build-out	
Molalla	5,395	8,842	61%

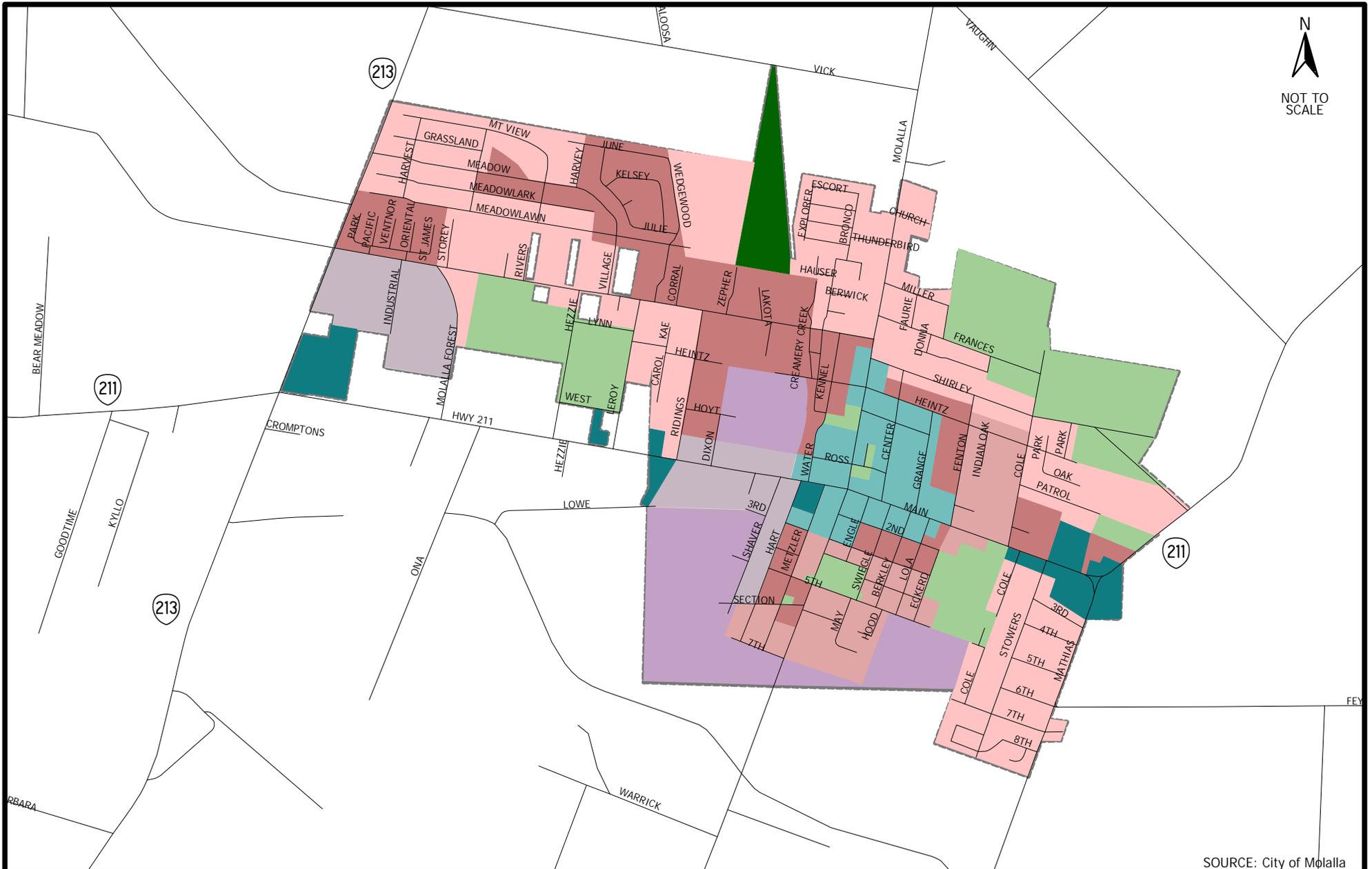


FIGURE
13

MOLALLA TRANSPORTATION SYSTEM PLAN

Current Zoning Map

Zoning Designations

- C1-Central Commercial
- C2-General Commercial
- M1-Light Industrial
- M2-Heavy Industrial
- PSP-Public or Semi-Public
- R1-Single Family Residential
- R2-Two Family Residential
- R3-Multi Family Residential
- EFU- Exclusive Farm Use
- City Limits

SOURCE: City of Molalla





SOURCE: City of Molalla

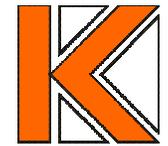
FIGURE
14

MOLALLA TRANSPORTATION SYSTEM PLAN

Current Molalla Land Use Plan

Land Use Designation

- | | |
|---|---|
|  CC-Central Commercial |  SFR-Single Family Residential |
|  GC-General Commercial |  TFR-Two Family Residential |
|  LI-Light Industrial |  MFR-Multi Family Residential |
|  HI-Heavy Industrial |  City Limits |
|  PSP-Public or Semi-Public |  Urban Growth Boundary |



As the build-out population is lower than the 20-year forecast population, approximately 310 additional acres of residential land will need to be added to the City to accommodate the forecast growth. However, the comprehensive plan currently provides no guidance as to where this growth may occur. Consequently, for the purposes of this TSP, two land use scenarios were developed. These scenarios are intended to illustrate the transportation impacts of growth in various parts of the City, and to identify future needs that are more-or-less independent of where growth occurs, as well as those needs that may be avoided depending on where growth occurs. It is emphasized that the land use scenarios are only for the purposes of identifying the future traffic impacts associated with the City's estimate of future population growth. These scenarios do not represent a commitment by the City to expand the UGB or to change land use designations in particular areas. A more detailed study conforming to the procedures set by Oregon Statewide Planning Rule 14 (Urbanization) will need to be performed before adjustments to the UGB can be enacted.

The first land use scenario ("east growth") represents a land use pattern preferred by the City's Planning Commission. Under this scenario, growth would occur closer to the historic center of Molalla, focusing activity around the downtown area, rather than towards Highway 213 and Portland. Under this scenario, the UGB would be expanded along the southeast, northeast, and north central edges of the City.

The second land use scenario ("west growth") represents a continuation of the current trend of Molalla evolving into a bedroom community for Portland. Under this scenario, the area between the north UGB and Vick Road is assumed to come into the UGB and develop within the next 20 years. As this area is still too small to accommodate all of the projected population growth, additional areas in the western portion of Molalla were identified for a hypothetical change in land use designation from industrial to residential.

Implications of the Land Use Assumptions

The assumptions used to develop the population projections directly impact the results of the analyses based upon these projections, as well as the costs that would be required to construct and/or operate the transportation improvements. Forecasting population 20 years into the future is an imprecise science and there are a number of ways that the assumptions used could vary from how growth actually occurs:

1. Growth could occur more slowly than anticipated (for example, because of a downturn in the economy), resulting in a smaller population than forecast. The population forecasts used for this study are fairly aggressive in terms of the amount assumed growth, and a larger growth rate is not likely.
2. Growth could occur at a lower density than assumed. This would not necessarily change the population forecast, but the amount of land consumed would be greater, possibly resulting in development occurring in other areas of the City than assumed.
3. Household sizes could be larger or smaller than assumed, resulting in a smaller or greater number of residences needed to house the assumed population.
4. In-fill development could occur. The vacant lands inventory accounted for large under-developed lots, but not individual lots that could accommodate one additional residence. Again, this would not necessarily change the population forecast, but the amount of new land required for housing would be smaller.
5. Clackamas County could approve new residential development outside the city limits, but inside the urban growth boundary. Although the City's land use plan shows that much of the undeveloped land in this area is intended to come into the City as light or heavy industrial land, the County's zoning allows residential uses, with an average lot size of 5 acres. If such rural residential development were to occur, the locations of new urban

residential development could be different than assumed, and the total amount of land used for housing would be greater.

If growth occurs more slowly than assumed, the amount of revenue available from transportation system development charges will be smaller than forecast. This will be offset to some degree by the fact that fewer transportation improvements will be needed, as the growth would not have occurred to warrant some of the improvements. However, the most expensive project identified in previous studies—upgrading the Molalla Forest Road for use as a bypass—is not particularly growth-dependent.

If limited amounts of growth were to occur in parts of the City than those assumed in the two scenarios, the overall conclusions of the intersection operations analysis described later in this section likely would not change. In particular, deficiencies that are identified as occurring in both scenarios can generally be assumed to occur regardless of where growth occurs.

TRANSPORTATION MODES AND FACILITIES

Pedestrian

Forecasts

As Molalla grows in population, it will become increasingly important to provide for alternative modes of transportation, such as walking. Over the 20-year planning horizon, Molalla can expect a population of more than 13,000 people. Most of this population increase will come in the form of single-family residential neighborhoods, where sidewalks and other forms of pedestrian pathways are important from a safety and community livability perspective.

Needs

The future 20-year pedestrian needs of Molalla are reflected in the deficiencies of the existing pedestrian network and the future land use development patterns called for in Molalla's land use plan. An analysis of these deficiencies and future needs reveal the need to improve and expand upon the pedestrian network over the next 20 years.

Adding Pedestrian Elements to Existing Roadways and Neighborhoods

The existing conditions section revealed a number of roadways and neighborhoods within the UGB that lack sidewalks and other forms of pedestrian connections. These future needs include the following:

- To improve connectivity and pedestrian safety, sidewalks are needed to provide access to educational facilities from all adjacent residential neighborhoods.
- More direct and efficient pedestrian connections are needed in and around the Molalla Buckaroo Grounds to provide access from the surrounding residential areas.
- Completing sidewalks or pathways on the City's collector and arterial street system, particularly Highway 211 and Toliver Road.

Pedestrian Elements Associated with New Development

The City of Molalla's comprehensive plan recognizes the need to "...provide safe pedestrian access to schools, parks, and shopping to make walking a realistic alternative to driving within the city." The City policy is extremely important to the provision of pedestrian facilities in Molalla over the next 20 years. Although the City's code provides for the construction of sidewalks associated with new development, the need exists to create an integrated pedestrian system that provides pedestrian circulation between different parts of the City, not just within the newer neighborhoods.

Future roadway design standards should continue to ensure that pedestrian facilities are provided in conjunction with all newly constructed roadway facilities and reconstructed arterials, collectors, and local streets. The alternatives analysis presented in the next section identifies specific locations to develop a comprehensive pedestrian network within the City.

Bicycle

Molalla's future bicycle needs are evident by the current lack of an integrated city-wide network of bicycle lanes and paths. Due to Molalla's relatively small size and level terrain, bicycling could provide a safe and convenient alternative to the automobile for short trips, particularly for travel between residential neighborhoods and schools and parks. Given the benefits of bicycle travel and Molalla's potential for increased bicycle access, a bicycle circulation plan is needed. Specific bicycle corridor alternatives are discussed in the alternatives analysis section.

Public Transportation

Forecasts

A significant portion of the South Clackamas Transportation District's (SCTD) revenue comes from payroll taxes on employers located within the district boundaries. As Molalla grows in the future, ridership demand should also increase; however, tax revenue may not increase at the same rate, because most of the new riders will be working outside the SCTD's boundary and will have their payroll taxes go to either Tri-Met or the City of Wilsonville's transit system, SMART.

Fortunately, the system currently has excess capacity on its primary 22-seat bus. If ridership demand exceeds this capacity in the future, the growth could be met by purchasing a larger bus (a capital cost), rather than by increasing service using SCTD's backup bus (incurring ongoing operations and maintenance costs). The amount of service provided on weekdays between Molalla and Oregon City (both in terms of frequency and span of service) is very good for a city of Molalla's size, and more frequent weekday service is likely not warranted.

Needs

Although SCTD's primary markets are currently Clackamas Community College students and commuters to Portland, Saturday service should be considered in the future as funding permits, in order to provide additional mobility options for Molalla residents on weekends.

SCTD is currently studying the need and resources available to implement a circulator bus that would operate within the City of Molalla. To avoid duplicating effort, this TSP defers to the SCTD study in determining public transit needs within the City. The results of the study, when completed, should be adopted by the City as the local public transit element of this TSP.

If Tri-Met significantly enhances service to Oregon City in the future, either through a Bus Rapid Transit (BRT) project or a light rail extension, SCTD should consider extending its Oregon City route to a station along the BRT or light rail line, so that passengers traveling all the way to Portland would not need to transfer twice. Extending the route past Clackamas Community College would mean that a second bus would need to be placed in service on the Molalla-Oregon City route, as the round-trip travel time would exceed the approximate one-hour headways currently used by SCTD, and it would not be desirable to lengthen the headways beyond one hour.

Rail

Rail service is not expected to resume to Molalla unless a new customer can be found, although the tracks may continue to be used for the leased storage of empty boxcars. The two main industries that currently ship products by truck through Molalla are the rock quarries south of Molalla and the Avison Lumber Mill. Rock is typically taken directly by truck from a quarry to the location where it will be used and therefore is usually not a good candidate for shipment by rail.

Depending on the kind of wood product and the distance involved, rail may or may not be a candidate for shipping wood products.

Although the Oregon Pacific Railroad tracks to Canby are in very poor condition, they could be used to carry freight from Molalla, within the 240,000-pound weight restriction per four-axle car. Upgrading the tracks to meet the state goal of 25 mph service is likely not economical at this point. If the tracks were to be abandoned in the future, they could be converted into a useful recreational bicycle trail. Even a short bicycle trail from Molalla to Liberal would provide access to the Molalla River and to the county road system, with little or minimal travel required along higher-volume roads such as Highways 211 and 213 and Molalla Avenue. The City may wish to encourage new industrial uses to locate adjacent to the rail line, if the use generates products that are capable of being shipped by rail.

Air

The *Molino Airport Layout Plan Update Report* was developed in 1993 by Aron Faegre & Associates and forecasts future operations through the year 2010. There are currently 40 aircraft based at the airport; this number is expected to grow by about 2% per year, resulting in about 55 aircraft by the year 2020, which can be accommodated by the facility in its current state. Drainage improvements would be needed to expand the airport and there are no plans to make this improvement.

The Skydive Oregon (formerly Hutchinson) Airport is owned and operated by Skydive Oregon, a parachute jumping operation. Daily operations range from 10-90 takeoffs and landings, with at least 50% of the airport operations being sky-dive related. Approximately 15 aircraft are based at the airport. Representatives of Skydive Oregon did not identify any future needs associated with the airport.

The Federal Aviation Administration requires runway protection zones that restrict development adjacent to the ends of runways, and recommends limiting land uses in the immediate area of an airport to noise-insensitive uses. The edge of the Molalla UGB (both the present and the potential future edge) is located far enough away from both airports that special zoning considerations to protect airport functions are not required.

Marine

No navigable waterways are located in the vicinity of Molalla.

Pipeline and Transmission Systems

The existing conditions inventory identified that the City's water distribution system recently doubled its capacity and that no natural gas restrictions exist or are anticipated in Molalla. PGE will bring a new electrical substation online in the near future.

No future deficiencies in the City's pipeline and transmission systems have been identified. As the City continues to grow, the City should monitor the capacity of its water system relative to the number of

customers it needs to serve and should plan to expand capacity as needed. Systems development charges can be assessed so that new growth pays its share of the costs of developing this expanded capacity.

Truck Freight Transportation

The majority of truck traffic in Molalla is generated by Avison Lumber Mill and by quarries located outside of Molalla. At present, during peak hours, up to six percent of vehicles passing through the Highway 211/Molalla Avenue intersection in the center of Molalla are trucks. Truck traffic is expected to continue in the future with the potential for increases in truck traffic associated with new quarries being developed south and east of Molalla. The Molalla Forest Road has been proposed in the past as a bypass route around downtown Molalla, to remove the majority of trucks from downtown Molalla, as well as through automobile traffic. Because local businesses will still need deliveries, some truck traffic will remain in downtown Molalla whether or not a bypass is constructed. The City may also wish to discuss with local industrial users the feasibility of shipping products by rail, rather than by truck, as another means of reducing area truck traffic.

Roadways

Forecasts

In order to determine the future traffic demand on the City of Molalla's roadways, growth estimates were based on the expected population in the year 2020, with the growth occurring in the locations previously identified for the two land use scenarios. Using aerial photographs, the vacant lands inventory, and the assumptions regarding future growth areas, residential neighborhoods were loosely defined for each scenario.

To account for regional traffic growth on the roadway networks, a net annual growth rate was chosen to develop base year 2019 traffic volumes. This rate was determined from a review of historical traffic volume trends along Highway 211 and Highway 213, anticipated population and employment growth in the surrounding communities, and knowledge of future planned developments in the region. Based on these factors, an annual growth factor of 2.0 percent was applied to the existing traffic counts to accommodate for background traffic on the roadway network over the 20-year period, consisting of traffic not associated with growth occurring within Molalla.

To determine the traffic-related impacts that local growth would have on the roadway network, future year weekday p.m. peak hour trips were derived from empirical observations at other similar residential developments. These observations are summarized in the standard reference manual, *Trip Generation*, 6th edition, published by the Institute of Transportation Engineers, 1997. With an estimated addition of approximately 2,273 single-family units, 238 two-family units, and 72 multifamily units in Molalla over the next 20 years, an additional 2,290 trips would be generated during the weekday p.m. peak hour. These residential-based trips were then distributed over Molalla's roadway network based on existing turning movement counts (particularly from the Big Meadow subdivision), employment generators outside of the City, and existing and future commercial and institutional generators located within the City. These local trips were added to the 2019 base volumes to develop the total volumes used in the future year analysis.

Intersection Operations

Intersection operations were analyzed using the procedures given in the 1994 *Highway Capacity Manual*. As stated in the previous section, traffic engineers describe how well an intersection operates using "levels of service" (LOS), representing ranges in the amount of delay that motorists experience when passing through the intersection. Levels of service range from "A" (best) to "F" (worst). For unsignalized

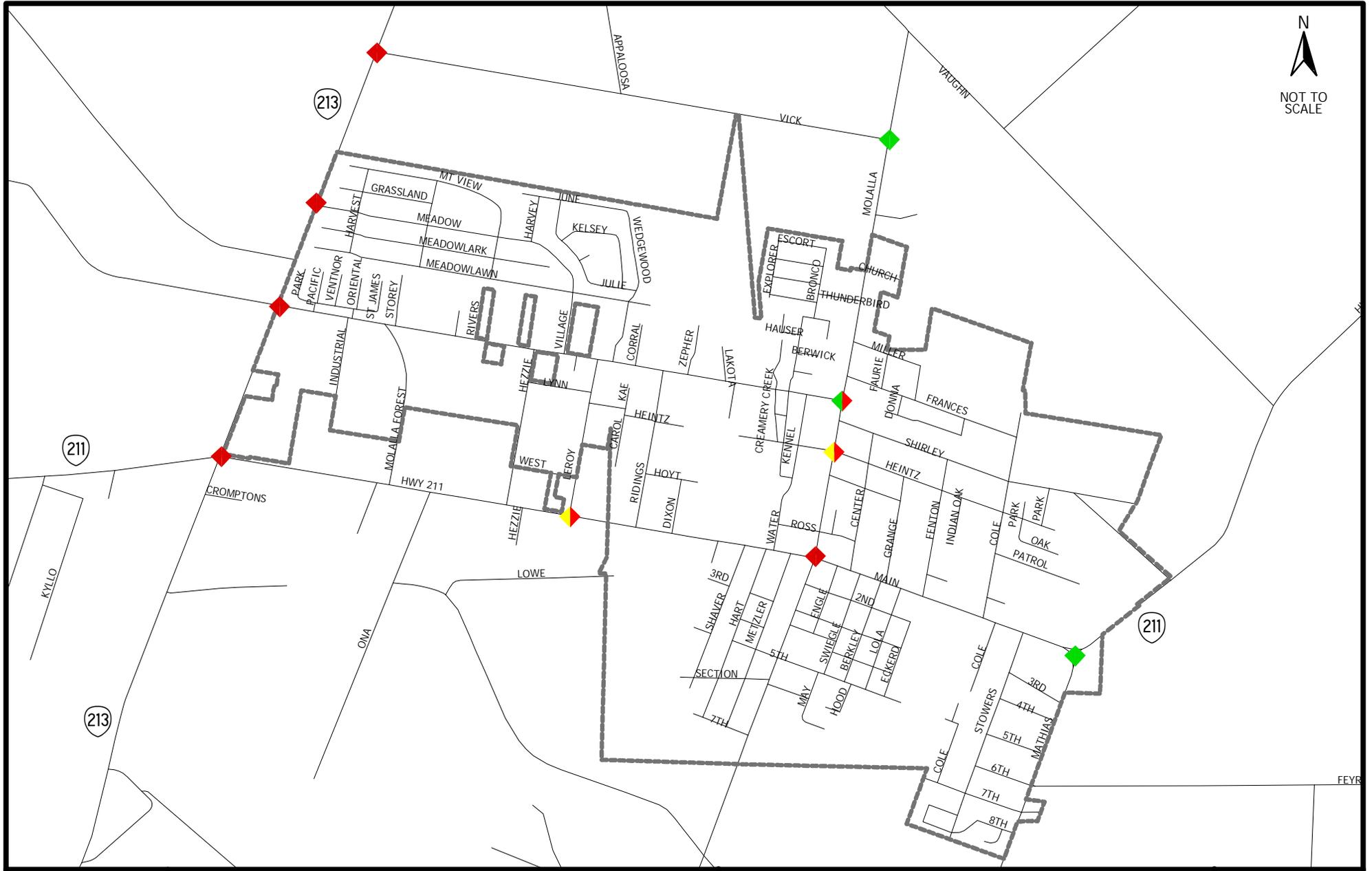
intersections, LOS “E” or better is generally considered to be acceptable, representing 45 seconds or less of delay to motorists. (For all-way stop intersections, “delay” represents the average delay experienced by all motorists using the intersection, while for two-way stop intersections, it represents the average delay of the worst movement, typically a left turn from the stop-controlled street.) ODOT uses a different criterion for intersections under its jurisdiction, based on the percent of the intersection’s capacity that has been used up. For state highway intersections within Molalla, ODOT considers operations to be acceptable when the intersection (or its critical movement) operates at 85% of its capacity or less.

For the purposes of this analysis, no roadway improvements were assumed. Thus, this analysis identifies year 2019 traffic conditions if the assumed growth were to occur, but no transportation system improvements were made to accommodate this growth. Table 7 identifies the estimated weekday p.m. peak hour levels of service at key intersections within the assumed 2019 city limits of Molalla for land use scenario #1; Table 8 presents similar information for land use scenario #2. Both tables also identify the critical approach, and the volume-to-capacity ratio and delay associated with the critical movement. Figure 15 summarizes these results in the form of a map.

Table 7
2019 Future Forecast Intersection Operations
Weekday PM Peak Hour
Land Use Scenario #1 (south & east growth)

Intersection	Two-Way Stop				All-Way Stop		
	Critical Approach	Critical V/C	Movement Delay (sec)	Movement LOS	V/C	Avg. Delay (sec)	LOS
Highway 211/Highway 213					>1.0	>45	F
Highway 211/Mathias Road	NBLT	0.51	19.7	C			
Highway 211/Molalla Avenue					>1.0	>45	F
Molalla Avenue/Heintz Street	WB	>1.0	>45	F			
Molalla Avenue/Tolliver Road	EB	>1.0	>45	F			
Leroy Avenue/Highway 211	SB	0.79	>45	F			
Highway 213/Meadow Road	WB	>1.0	>45	F			
Tolliver Road/Highway 213	WB	>1.0	>45	F			
Highway 213/Vick Road	WB	0.74	>45	F			
Vick Road/Molalla Avenue	EB	0.38	9.3	B			

v/c = volume-to-capacity ratio, LOS = level of service, NB = northbound, SB = southbound, EB = eastbound, WB = westbound, LT = left turn



N
NOT TO SCALE

FIGURE
15

MOLALLA TRANSPORTATION SYSTEM PLAN

2019 No-Build Intersection LOS

Intersection Level of Service
(North & West Growth) Scenario



Intersection Level of Service
(South & East Growth) Scenario



Level of Service

- ◆ A-C
- ◆ D-E
- ◆ F

- Street
- - - City Limits



Table 8
2019 Future Forecast Intersection Operations
Weekday PM Peak Hour
Land Use Scenario #2 (north & west growth)

Intersection	Two-Way Stop				All-Way Stop		
	Critical Approach	Critical V/C	Movement Delay (sec)	Movement LOS	V/C	Avg. Delay (sec)	LOS
Highway 211/Highway 213					>1.0	>45	F
Highway 211/Mathias Road	NBLT	0.47	18.5	C			
Highway 211/Molalla Avenue					>1.0	>45	F
Molalla Avenue/Heintz Street	WB	0.69	37.5	E			
Molalla Avenue/Tolliver Road	EB	0.42	8.0	B			
Leroy Avenue/Highway 211	SB	0.61	38.3	E			
Highway 213/Meadow Road	WB	>1.0	>45	F			
Tolliver Road/Highway 213	WB	>1.0	>45	F			
Highway 213/Vick Road	WB	>1.0	>45	F			
Vick Road/Molalla Avenue	WB	0.13	5.3	B			

v/c = volume-to-capacity ratio, LOS = level of service, NB = northbound, SB = southbound, EB = eastbound, WB = westbound, LT = left turn

As shown in the above figure and tables, the following intersections will operate at an unacceptable LOS F by the year 2019, if no improvements are made to the City’s transportation system, no matter where growth occurs:

- Highway 211/Molalla Avenue;
- Highway 211/Highway 213;
- Highway 213/Toliver Road
- Highway 213/Meadow Road; and
- Highway 213/Vick Road.

All five intersections are located on the state highway system, reflecting the importance of the state highways in serving Molalla, the number of commute trips to the Portland metropolitan area, and the future commercial development that will be focused on these high-volume highways.

As shown in Table 7, growth occurring in the southern and eastern portions of the city will result in a greater number of intersection capacity problems, as people will travel through more intersections within the City to get to their desired destinations. In addition to the intersections listed above, the following intersections will operate at LOS F under land use scenario #1:

- Leroy Avenue/Highway 211;
- Molalla Avenue/Tolliver Road; and
- Molalla Avenue/Heintz Street.

Previous studies have identified the future need for improvements at some of these locations. The traffic impact study performed for the proposed Gramor development at the Highway 211/Highway 213 intersection identified the future need for a traffic signal. The Clackamas County Comprehensive Plans

identified the need for a traffic signal and turn lanes at the Highway 211/Molalla Avenue intersection, as well as road widening on Highway 213 north of Highway 211 to provide left-turn lanes at major intersections.

However, not all improvements need take the form of intersection improvements. The operational problems at the Highway 213 intersections are created in large part by traffic from new residential development that desires to go to the commercial uses located around the Highway 211/Highway 213 intersection. This traffic has no choice but to make a left turn onto Highway 213, as no other parallel north-south routes exist. If parallel routes did exist, these left turns could be converted into right turns at other locations, with much smaller impacts to the state highways.

Other potential actions involve land use incentives. Rather than have all new development occur adjacent to the state highways, incentives, such as reduced parking requirements or lowered system development charges, could be used to encourage new commercial development to locate in the City's downtown area. The downtown area is well-served by multiple streets, which serve to distribute traffic over a number of routes, with no one route becoming overloaded and requiring improvements. Development adjacent to the state highways, in contrast, concentrates local trips onto the state highway system, impairing their role to carry through trips, and speeding up the time when roadway improvements will be required.

Connectivity

The intersection operations analysis revealed that the majority of traffic growth will occur along the Highway 213 corridor over the next 20 years. To alleviate the projected increases in volumes, it is apparent that the City needs to develop additional north-south roadway corridors. These corridors should provide more direct links to local shopping destinations, and between adjacent developments, allowing more of the local trips to stay off the Highway 213 corridor or, at least, avoid making left turns on and off the highway. Desirably, these corridors would extend all the way between Highway 211 and Vick Road. Unfortunately, development that has already occurred in the Big Meadows subdivision may prevent the possibility of developing these connections in full in the western part of the City.

An east-west collector street located between Highway 211 and Toliver Road would also be desirable to help relieve local traffic pressures on Highway 211. Again, existing land use patterns may preclude the development of such a street. The alternatives analysis section presents potential street connections to improve connectivity. The City should also review its subdivision ordinance with the intent to strengthen requirements for providing for future street connections.

Needs

In addition to the intersection operations and connectivity needs identified above that are related to the future growth of the City, the safety and intersection geometric needs identified in the existing conditions section will still exist. These, too, are addressed in the alternatives analysis section of this TSP.

POLICY CHANGES

For many smaller Oregon cities, such as Molalla, the main street through the city is also a state highway, which can lead to conflicts between the city's needs for local access and the state's needs for moving through traffic. Under the previous *1991 Oregon Highway Plan*, the same access spacing requirements and minimum traffic operations standards apply to the entire length of the state highway through the city, without regard to how land uses adjacent to the highway might be different from, for example, the downtown area compared to the edges of the city.

The 1999 Oregon Highway Plan addresses this issue by allowing cities to designate in their Transportation System Plans “special transportation areas” (STAs), “urban business areas” (UBAs) and “commercial centers.” Within these areas, a city and ODOT have jointly agreed on the relationship between the adjacent land uses and the function of the state highway (e.g., that in an STA, land access has a higher priority than through traffic movement). In these areas, ODOT agrees to allow closer access spacing than it would normally allow and/or a lower level of traffic operations. In return, the city agrees to maintain certain design and land use characteristics, such as good street connectivity that provides alternatives to the state highway, compact development, and safe and convenient pedestrian and bicycle circulation. The following paragraphs describe the characteristics of each type of area in more detail.

Special Transportation Areas

STAs are located within an existing or planned downtown, business district, or community center, or are the redevelopment of an area within a UGB to eliminate a pattern of strip development along a highway. STAs must be designated in the city’s TSP and also require an intergovernmental agreement or memorandum of understanding between the city and ODOT. They have the following characteristics:

- a compact area with interconnected local street networks;
- convenience of movement focused on pedestrians, bicycles, and transit (where available), rather than automobiles;
- traffic speeds are generally 25 mph or less;
- mixed land uses;
- buildings spaced close together and adjacent to the street with little or no setback;
- sidewalks with ample width located adjacent to the highway and buildings;
- public road connections preferred over private driveways;
- on-street parking and shared or general-purpose parking lots located behind or to the side of buildings; and
- streets designed for ease of pedestrian crossing.

The section of Main Street between Hart Avenue and Grange Street has most of these characteristics, although pedestrian and bicycle issues would need to be addressed.

Urban Business Areas

UBAs are areas of existing or future commercial activity where vehicular accessibility is important to continued economic viability. They are designated in a city’s TSP and have the following characteristics:

- traffic speeds are generally 35 mph or less;
- vehicular accessibility is as important as pedestrian, bicycle, and transit accessibility, but facilities for alternative modes (e.g., sidewalks, bike lanes, etc.) are still provided, and measures for addressing pedestrian crossing safety are addressed, particularly at transit stops and high-use pedestrian generators;
- safe and regular street connections are encouraged; and
- new buildings with a UBA should be clustered in centers or nodes, so that people who arrive by car or transit can walk from place to place within the area.

There are three nodes of commercial activity in Molalla along state highways that are outside the central business district: (1) an area centered on the Highway 211/Mathias Street intersection, (2) an area on Highway 211 between Dixon and Hezzie Avenue, and (3) an area centered on the Highway 211/Highway 213 intersection. Because these are relatively small areas, the “commercial center” category described next may not be appropriate for these areas. Because of its proximity to established residential neighborhoods (with greater opportunities for pedestrian and bicycle access), a UBA designation should be considered in particular for the area around the Highway 211/Mathias Road intersection.

Commercial Centers

Commercial Centers are existing or future centers of commercial activity of 400,000 square feet or more of gross leasable area or public buildings. Uses can include commercial and office activities, and multi-family residential uses may be located within or adjacent to the center. Commercial Centers are designated in a city’s TSP and have the following characteristics:

- through traffic movement has higher priority than local land access;
- centers cluster development and have limited state highway access in order to reduce conflicts with through traffic and minimize the number of vehicle trips on the state highway;
- the majority of daily trips to the center originate within the community;
- centers provide both a high level of regional accessibility and connections to the local road network;
- buildings have consolidated access to the state highway, rather than being developed along the highway with multiple accesses; and
- convenient internal circulation is provided, with provisions for pedestrian, bicycle, and transit (where available) movement.

The area around the Highway 211/Highway 213 may have enough development potential for a commercial center designation; however, a UBA designation should also be considered. A significant challenge to creating either designation in this area is the ability to provide local street access.

Summary of Benefits

Table 9 compares the traffic operations and access spacing standards for each of these designations, compared to the usual standard for a District Highway with a posted speed of 35 mph or lower in a city the size of Molalla. It should be noted that the access spacing standards shown are those currently proposed by ODOT; they have not yet been adopted by the Oregon Transportation Commission.

**Table 9
 Access Spacing and Operations Standards for State Highways**

Type of Standard	Typical	STA	UBA	Commercial Center
Min. Access Spacing (feet), ≤35 mph	400	*	350	400
Max. Volume-to-Capacity Ratio	0.85	0.95	0.85	0.95

*Average city block spacing (approximately 300 feet in downtown Molalla)

ODOT staff have suggested there will likely be few STA and UBA designations within ODOT Region 1 (northwest Oregon) outside the Portland metropolitan area. This is because most smaller communities have lost their storefront-oriented “main streets” in favor of strip developments and wide, pedestrian-

unfriendly roadways that serve as barriers to pedestrian and bicycle travel. Because of this, it is possible that Molalla could use an STA or UBA designation to seek priority preference for state funding for bicycle, pedestrian, and transit improvements to support alternative mode access within its STA/UBA areas. Since these designations only apply to state highways, developing a Forest Road bypass as a state highway would preclude these designations, unless Main Street were to remain part of the state highway system (for example, as a business route).

SUMMARY OF FUTURE CONDITIONS

Without any new investments in the City's transportation system, other than the streets needed within the new subdivisions, the impacts of future growth will be felt especially on the state highway system, namely Highways 211 and 213. Five intersections will not meet operational standards by the year 2019, no matter where growth occurs: Highway 213/Vick Road, Highway 213/Meadow Road, Highway 213/Toliver Road, Highway 213/Highway 211, and Molalla Avenue/Highway 211 intersection. If the City expands to the east and south, the Molalla Avenue/Heintz Street, Molalla Avenue/Toliver Road, and Leroy Avenue/Highway 211 intersections will also not meet operational standards by 2019.

Although the land use scenario preferred by the project advisory committee will result in a greater number of intersection improvements over the 20-year period, it is felt that having future growth occur closer to downtown rather than in the area closest to Portland will create a greater sense of community and preserve the vitality of downtown. Also, trips occurring during off-peak times will tend to be shorter, because services will be provided closer to where people live.

Most other transportation modes—intercity transit, rail, air, and pipeline—have sufficient capacity to meet the city's 20-year needs. Local transit service will be addressed by a separate study sponsored by the South Clackamas Transportation District. The pedestrian and bicycle system needs identified in the existing conditions memorandum will still exist if new investments are not made, but these needs will be more urgent because of the increased population.

Section 4

Alternatives Analysis

Alternatives Analysis

INTRODUCTION

The previous section on future conditions identified transportation system deficiencies that will develop in Molalla over the next 20 years if no improvements are made to the system as Molalla grows. Attention now turns to ways of addressing these deficiencies. There is often more than one way to solve these deficiencies and not all potential solutions involve road construction—for example, focusing growth in a different direction may keep a problem from occurring.

This section presents the transportation improvement alternatives that could be implemented to mitigate the existing and future transportation deficiencies. As each potential project was developed, consideration was given to how a multi-modal approach could be taken. Thus, while the primary impetus for a given mitigation alternative may center on increasing vehicular capacity, provision of appropriate bicycle and pedestrian facilities was given equal consideration.

This section is organized into three main parts. First, the various combinations of growth scenarios and Molalla Forest Road uses are reviewed. Second, specific improvement projects and costs are identified to mitigate identified operational problems under each scenario, as well as projects and costs associated with needed pedestrian, bicycle, and safety improvements identified in the future conditions section. Finally, third, the consultant recommended alternative and the preferred alternative selected by the project advisory committee are presented.

LAND USE SCENARIOS

The future conditions section identified that there was insufficient land zoned for residential uses within the City of Molalla's Urban Growth Boundary (UGB) to accommodate the City's forecast population of 13,370. As a result, a UGB expansion needed to be assumed in order to develop realistic 20-year traffic volume forecasts for the Transportation System Plan (TSP). Normally, consideration of a UGB expansion would be undertaken as part of an update of the City's comprehensive plan and would include a detailed study conforming to Oregon Statewide Planning Rule 14 (Urbanization), looking at factors such as soil quality, wetlands, and so on. Such a study is beyond the scope of this TSP and the comprehensive plan is not scheduled to be updated until a couple of years after this TSP is adopted. Therefore, to provide some guidance on potential transportation impacts related to *where* growth may occur, this alternatives analysis continues the two land use scenarios developed in the future conditions analysis.

Land use scenario #1 ("east growth") is the growth scenario preferred by the City Planning Commission and the project advisory committee. The intent of this scenario is to promote housing locations that keep Molalla as a more compact, self-contained community with a healthy downtown core. Residential growth outside the UGB is assumed to occur in three locations:

- Along the southern edge of Molalla, within an area bounded by Molalla Forest Road, Molalla Avenue, Sawtell Road, Eves Road, and Mathias Road. It is assumed that the proposed park north of Molalla Forest Road and west of Mathias Road would be brought into the City first.
- Along the northern edge of Molalla, north of the high school and east of Molalla Avenue.
- In the area south of Vick Road between the railroad tracks and Molalla Avenue.

Land use scenario #2 ("west growth") attempts to represent current development trends. Growth locations outside the UGB for this scenario consist of the following:

- New development in the area south of Vick Road and north of the current UGB.
- Rezoning of an area in the southwest corner of the City within the current UGB from industrial to residential.

This second scenario was not preferred by the Planning Commission and advisory committee because they felt that the character of Molalla would change as a result of that growth pattern. In addition, the area assumed to be rezoned from industrial to residential was felt to be incompatible with current plans and would be next to potential truck routes serving new industrial development in the southern portion of the City. Nevertheless, in the absence of a definite plan for growth, this scenario forms a useful basis for comparing the effects of where growth occurs.

MOLALLA FOREST ROAD SCENARIOS

The Molalla Forest Road is a former logging road that passes through the western and southern portions of Molalla, mainly through industrial-zoned land. This road was proposed in the City's 1989 Transportation Study as a bypass of downtown Molalla, helping to remove through traffic—particularly trucks—from downtown. The road is currently owned by the City of Molalla, but is closed to automobile use in most locations, except for a section southeast of Ona Road. Three scenarios have been developed for its future use.

Under both a city-wide no-build scenario (presented in the future conditions analysis), and Forest Road scenario #1 (No Bypass), the road would remain generally closed to automotive use, except for the dead-end portion southeast of Ona Road that is currently open. East-west through traffic would continue to use Main Street through downtown. Under the city-wide no-build scenario, Main Street would be the only continuous east-west roadway through Molalla, and would bear the brunt of traffic growth occurring internal and external to Molalla. In other growth scenarios that do not include the Forest Road, local automobile traffic would have additional east-west options available to them, providing some traffic relief to Main Street. Under the no-build scenarios, the Forest Road could be converted into a multi-use pathway connecting the proposed park in the City's southeast corner with residential land in the northwest corner.

Under scenario #2 (Industrial Access), the portion of the Forest Road between Ona Road and Mathias Road would be rehabilitated and widened to collector street standards to provide trucks with a more convenient route to most of the City's industrial areas. The road would also provide access to any residential development that occurred following a UGB expansion in the southeast portion of Molalla. Access to the state highway system on the west would be via a widened Ona Road and a new east-west collector street from Highway 213 following an existing private driveway just north of the current UGB. (Figure 17, found later in this section, depicts the potential street alignments.) The section of the Forest Road between Ona Road and Highway 211 would not be improved because of the proximity of the roadways' intersection to a culvert over Bear Creek that would need to be replaced. Under scenario #2, the Forest Road would handle traffic from future residential and industrial growth in southern Molalla, but would not be intended to divert existing traffic from Main Street.

Under scenario #3 (Downtown Bypass), Highway 211 would be realigned onto the Molalla Forest Road to the west of its former intersection with the Molalla Forest Road. The Forest Road would be upgraded to state highway standards between Main Street and Mathias Road, and Mathias Road would be upgraded between Main Street and the Forest Road. To protect the long-term function of the Forest Road as a bypass, strict access limitations would be placed on the road, limiting access to primarily public street connections. Approaching Molalla from the west, traffic bound for downtown would make a left turn off the highway to get onto Main Street (see Figure 17). Approaching from the east, several options exist to encourage the use of the bypass, which will be discussed later in this memorandum. Main Street itself

would be improved with pedestrian and bicycle treatments intended to discourage through traffic and encourage lower speeds. Under scenario #3, the Forest Road would handle the majority of the east-west traffic passing through Molalla, and would also serve as an industrial access route and as access to any residential growth in southeastern Molalla.

ROADWAY IMPROVEMENT ALTERNATIVES

The following sections describe roadway improvement alternatives that address roadway capacity, operations, maintenance, and safety needs previously identified in this study. Sources for these needs include the following:

- the existing and future conditions memos;
- the 1989 Molalla Transportation Study;
- the 1999 Molalla Systems Development Charge study; and
- staff, public, and advisory committee input.

Figure 16 depicts the locations of these projects. The following sections describe each potential project in greater detail.

Intersection Improvements

Table 10 summarizes intersection improvements required under each land use and Forest Road scenario. A description of each project follows.

The potential projects were identified based on one or more of the following factors:

- operational deficiencies (i.e., poor level of service) either now or in the future;
- safety deficiencies previously identified;
- geometric (intersection alignment) deficiencies previously identified;
- geometric changes required to direct traffic to particular roadways.

A planning level estimated cost is provided for each project, along with a likely source of funding. Projects that are directly triggered by nearby development are assumed to be constructed as a condition of that development, while projects triggered by general growth or that are an existing need are assumed to be funded through system development charges (SDCs).

Vick Road/Highway 213

With growth in eastern Molalla, the Vick Road/Highway 213 intersection is forecast to operate at level of service (LOS) “F” for the Vick Road approach by the year 2019; however, a traffic signal will not be warranted. To improve operations to an acceptable LOS “E”, left turn lanes could be constructed southbound on Highway 213 and westbound on Vick Road to store vehicles waiting to turn left. The estimated cost of this improvement is \$90,000, which would most likely come from City SDC funds if the intersection were brought into the UGB. Otherwise, funding would likely have to come from ODOT, which would likely give the project a low funding priority unless it developed into an accident problem.

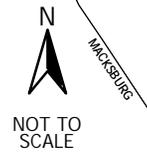
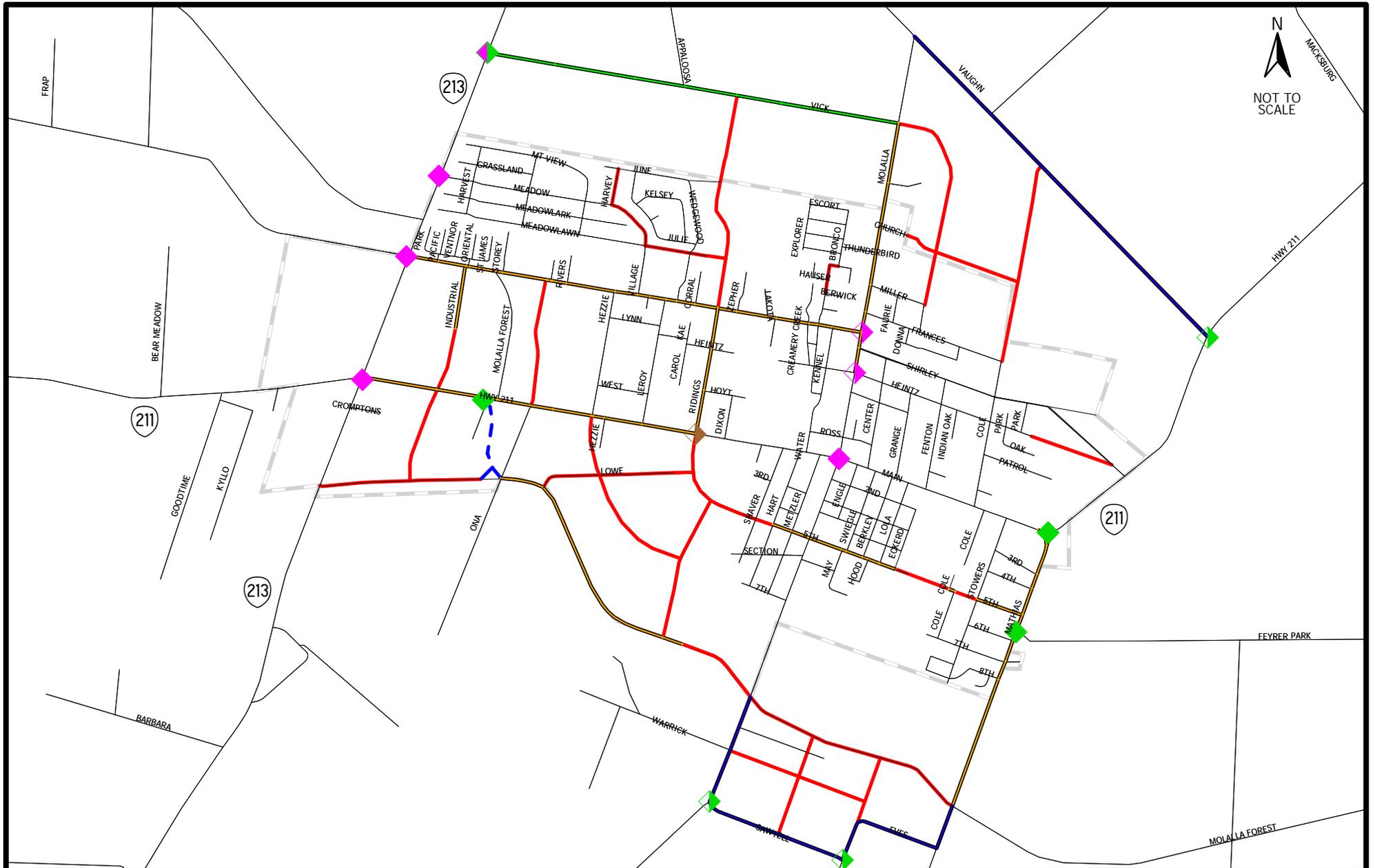


FIGURE
16

MOLALLA TRANSPORTATION SYSTEM PLAN

Project Alternatives Analyzed

- | | |
|------------------------------|--|
| New public roadways | Intersection projects (east growth) |
| — All build scenarios | ◆ Signal |
| - - Bypass scenario only | ◆ Signal (no-build only) |
| Road widening | ◆ Geometry |
| — All build scenarios | Intersection projects (west growth) |
| — West growth only | ◆ Signal |
| — East growth only | ◆ Geometry |
| — 1999 Urban Growth Boundary | |



Table 10
Intersection Project Summary

Intersection/Project	East Growth			West Growth		
	No Bypass	Industrial Access	Down-town Bypass	No Bypass	Industrial Access	Down-town Bypass
Vick Road/Highway 213						
Signalize, add left-turn lanes on all approaches				✓	✓	✓
Add left-turn lanes on all approaches	✓	✓	✓			
Meadow Drive/Highway 213						
Signalize	✓	✓	✓	✓	✓	✓
Toliver Road/Highway 213						
Signalize, add left-turn lanes on all approaches	✓	✓	✓	✓	✓	✓
Highway 211/Highway 213						
Signalize, add left-turn lanes on all approaches, add WB right-turn lane					✓	✓
Signalize, add left-turn lanes on all approaches, add NB &WB right-turn lanes	✓	✓	✓			
Ridings Avenue/Main Street						
No mitigation required		✓	✓	✓	✓	✓
Signalize, add left-turn lanes on Main Street	✓					
Molalla Avenue/Main Street						
Signalize, add left-turn lanes on all approaches		✓			✓	
Signalize, add left-turn lanes on Molalla Avenue			✓			✓
Signalize, add left-turn lanes on all approaches & right-turn lanes on Main St.	✓					
Molalla Avenue/Heintz Street						
No mitigation required					✓	✓
Signalize	✓	✓	✓			

**Table 10 (cont'd.)
Intersection Project Summary**

Intersection/Project	East Growth			West Growth		
	No Bypass	Industrial Access	Down-town Bypass	No Bypass	Industrial Access	Down-town Bypass
Molalla Avenue/Toliver Road						
No mitigation required				✓	✓	✓
Signalize	✓	✓	✓			
Molalla Avenue/Mick Road						
No mitigation required	✓	✓	✓	✓	✓	✓
Mathias Road/Main Street						
Construct "T" intersection or roundabout	✓	✓	✓	✓	✓	✓
Vaughn Road/Highway 211						
No mitigation required				✓	✓	✓
Add EB left-turn lane, improve sight distance	✓	✓	✓			
Freyrer Park Road/Mathias Road						
Realign Freyrer Park Road, construct "T" intersection	✓	✓	✓	✓	✓	✓
Molalla Forest Road/Main Street						
No mitigation required	✓	✓		✓	✓	
Realign Main Street, construct "T" intersection or roundabout						✓
Eves Road/Sawtell Road						
No mitigation required				✓	✓	✓
Construct "T" intersection	✓	✓	✓			
Molalla Avenue/Sawtell Road						
No mitigation required				✓	✓	✓
Construct "T" intersection	✓	✓	✓			

With growth in western Molalla, the intersection is forecast to operate at LOS “F” and over capacity for the Vick Road approach. Under this land use scenario, a significantly greater number of vehicles would be expected to make turns at the intersection. As a result, a traffic signal would be warranted, along with westbound and southbound left-turn lanes, and a northbound right-turn lane. With these improvements, the intersection would operate at LOS “B” and at 83% of capacity. The estimated cost of this improvement is \$240,000, which could be paid for by nearby development triggering the improvements.

Meadow Drive/Highway 213

The Meadow subdivision is expected to be fully built out by the year 2019, housing a sizable proportion of Molalla’s new residents. As a result, significant traffic increases will occur at the Meadow Drive/Highway 213 intersection. By the year 2019, this intersection will operate at LOS “F” and over capacity for the Meadow Drive approach under all scenarios. To restore good operations, a traffic signal will be required, at an estimated cost of \$150,000. With the signal, the intersection will operate at LOS “B.” Future development that uses Meadow Drive as an access should be the funding source. The amount of reserve capacity remaining following signalization will be greater with growth in eastern Molalla than with growth in western Molalla.

Toliver Road/Highway 213

The Toliver Road/Highway 213 intersection is forecast to operate at LOS “F” and over capacity for the Toliver Road approaches by 2019 under all scenarios. In addition, left-turn lanes on Highway 213 are an existing need to improve safety and to avoid delays to through traffic on the state highway. A traffic signal will be warranted, along with left-turn lanes on all approaches. With these improvements, the intersection will operate at LOS “B”. The amount of reserve capacity will be greater with growth in eastern Molalla than with growth in western Molalla, because eastern Molalla trips are through movements, while western Molalla trips are both through and turning movements. This improvement is estimated to cost \$330,000, with costs paid for by SDCs and/or nearby development triggering the need for the improvements.

As an alternative to signalization, the intersection was examined to evaluate the potential for constructing a modern roundabout. A single-lane roundabout would provide satisfactory operations. However, because a roundabout would require a circular area approximately 120 feet in diameter in order to accommodate truck traffic, intersection widening and signalization is likely more feasible from a right-of-way acquisition and terrain perspective.

Highway 211/Highway 213

Highways 211 and 213 currently handle the majority of traffic traveling into and out of Molalla and will continue to do so in the future. When the Gramor site on the northeast corner of the Highway 211/Highway 213 intersection develops, sewer service will be extended into this area, making it even more attractive for commercial development. As a result, local traffic traveling through this intersection will increase, along with traffic generated external to Molalla traveling to the commercial establishments.

Under all scenarios, this intersection is forecast to operate over capacity and at LOS “F” by the year 2019, but most likely at the time additional significant commercial development occurs in the intersection vicinity. To mitigate this condition, signalization will be required under all scenarios, along with left-turn lanes on all approaches and a westbound right-turn lane. With growth in eastern Molalla, a northbound right-turn lane will also be required to keep the intersection operating within ODOT standards. With these improvements, the intersection will operate at LOS “D” and at 85% of capacity or less. The estimated cost of the improvements ranges from \$350,000 to \$450,000, which could be paid for by nearby development triggering the improvements.

Ridings Avenue/Main Street

Leroy Avenue is currently a major north-south route between Toliver Road and Main Street. Under any scenario except the no-build scenario, Ridings Avenue is proposed to become a major collector street and it is anticipated that much of the non-school-related traffic using Leroy will switch to Ridings Avenue.

With growth in eastern Molalla and without the Forest Road, the Ridings Avenue/Main Street intersection is forecast to operate at LOS “F” by the year 2019 and will meet signal warrants. With signalization and the addition of left-turn lanes on Main Street, conditions will improve to LOS “B.” The cost of this improvement is approximately \$200,000, with SDC funds as the likely source.

Molalla Avenue/Main Street

As Molalla strives to keep its downtown core area vibrant, the intersection of Molalla Avenue and Main Street will become more congested as time goes on. As described in the future conditions section, the Molalla Avenue/Main Street intersection is expected to operate above capacity within the next twenty years. Currently, this intersection is four-way stop-controlled and will require some level of mitigation under all combinations of land use and Forest Road scenarios.

With growth in eastern Molalla, the Molalla Avenue/Main Street intersection is forecast to operate at LOS “F” and above capacity by the year 2019. With more residential development clustered closer to the downtown area, a traffic signal will be warranted in order to restore acceptable traffic operations to the intersection. In addition, several other mitigation measures will be required depending on how the Forest Road is developed.

First, with the development of the Forest Road as an industrial access, left-turn lanes will be required on all approaches. With these improvements, the intersection will operate at a LOS “D” and at less than 85% of its capacity, but will require the removal of on street parking on both streets in order to accommodate the left-turn lanes. The estimated cost of this improvement, including signalization, is \$170,000. The elimination of on-street parking along Molalla Avenue and Main Street would require the need for new parking areas, most likely in the form of an off-street parking lot. Land for the parking lot would need to be found within a close proximity to the downtown area. The estimated cost associated with the construction of a 200-300 stall parking lot is \$500,000.

With the development of the Forest Road as a downtown bypass, left-turn lanes will be required only on the Molalla Avenue approaches to the intersection. With these improvements, the intersection will operate at LOS “B” and a capacity of 82%, and will only require the removal of on street parking along Molalla Avenue. The estimated cost of the total improvement is \$160,000. The elimination of on street parking along Molalla Avenue would require the need for new parking areas, most likely in the form of an off-street parking lot. A more aggressive alternative would involve the restriction of the northbound and southbound left-turn movements on Molalla Avenue. In this case, the northbound left-turns at the Main Street/Molalla Avenue intersection would be diverted onto 5th Street/Ridings Avenue and the southbound left-turns would be diverted onto Heintz Street. This would avoid the need for removing the on-street parking within the downtown area, however it would require the need for Ridings Avenue to be extended south to 5th Street and for Heintz Street, 5th Street, and Ridings Avenue to be upgraded to major collector street status.

Finally, under the no-build scenario, signalization, left-turn lanes on all approaches, and a right-turn lane on Main Street will be required to restore acceptable traffic operations to the intersection. This strategy is undesirable, as it will require the removal of all on-street parking, the acquisition of right-of-way from the surrounding land uses, and removal of one or more adjacent buildings.

With growth in western Molalla, the no-build and industrial access Forest Road scenarios will warrant intersection signalization and the development of left-turn lanes on all approaches. These improvements will restore traffic operations at the intersection to LOS “B” and to less than 85% of its capacity. This strategy will require the removal of on street parking on all four legs of the intersection in order to accommodate the left-turn lanes. The estimated cost of this improvement is \$170,000. With the development of the Forest Road downtown bypass, signalization and the development of left-turn lanes on the Main Street approaches will be warranted. With these improvements, the intersection will operate at a LOS “B” and at 78% of its capacity. The estimated cost of this improvement is \$160,000.

SDC funds are the likely source for improvement costs. Since this is an important intersection of a state highway and a county highway, some participation by ODOT and Clackamas County is also possible.

Molalla Avenue/Heintz Street

Because Heintz Street is located near the downtown core commercial area, future year 2019 traffic conditions are expected to be significantly worse under the east growth land use scenario than the west growth land use scenario. In particular, this intersection is forecast to operate at a LOS “F” as a result of increased southbound through traffic on Molalla Avenue. To mitigate this condition, intersection signalization will be required at a cost of \$150,000, with SDCs as the funding source. With this improvement, the intersection will operate at an acceptable LOS “B”. Under the west growth scenario, no mitigation will be required.

Molalla Avenue/Toliver Road

Like the Molalla Avenue/Heintz Street intersection, the Molalla Avenue/Toliver Road intersection is expected to experience higher traffic volumes as a result of the east growth land use scenario. The addition of southbound traffic at the intersection is expected to cause increased delays to eastbound vehicles turning left onto Molalla Avenue. This will result in a LOS “F” condition at the intersection. To improve operations to an acceptable LOS “B”, a traffic signal will be warranted. The estimated cost of this improvement is \$150,000, with future residential development a potential funding source. Under the west growth scenario, no mitigation will be required.

Molalla Avenue/Vick Road

Under both east and west growth scenarios, this intersection is expected to continue to operate at acceptable LOS standards under forecast year 2019 traffic conditions.

Mathias Road/Main Street

This intersection is currently a “Y” intersection, which increases the number of potential conflict points between automobiles, and promotes higher-speed turning maneuvers. Under any build scenario, converting this intersection into another form is recommended.

Under the Industrial Access scenario for the Forest Road, the intersection could be turned into a conventional “T” intersection, with Main Street being the priority movement and Mathias Road stop-controlled. Under the Downtown Bypass scenario, the intersection could also be a “T,” but with the realigned Highway 211 as the priority movement and Main Street stop-controlled. The estimated cost of either of these improvement alternatives is \$400,000.

Under either scenario, the “Y” could also be replaced with a modern roundabout. The roundabout is not needed for capacity reasons, but would provide a traffic-calming effect and would also provide an opportunity for creating an aesthetic landscaping treatment that would serve as a gateway to the City. A roundabout would likely be more appropriate under the Industrial Access scenario, where it would be

desirable to slow traffic down before it enters Main Street, than under the Downtown Bypass scenario, where providing clear direction onto the bypass route would be desired. The estimated cost of a roundabout is \$350,000.

This intersection improvement would most likely be constructed concurrent with any Forest Road construction. The costs would be funded by SDCs.

Mathias Road/Freyrer Park Road

This intersection also has unusual geometry, with Freyrer Park Road curving 90 degrees through the intersection, and with roads intersecting at three different locations. To create a better intersection, three alternatives are possible:

1. A four-leg intersection with 6th Street. This would place the intersection closest to the Forest Road and maximize the distance between 5th Street and Freyrer Park Road. The estimated cost of this improvement is \$100,000.
2. A three-leg intersection between 5th and 6th Street. This was recommended in the 1989 Transportation Plan, in part to avoid having through traffic face a local street and possibly head down it by mistake. This configuration places the 5th and Freyrer Park intersections closer together, making it more difficult to develop left-turn lanes at the two intersections. The estimated cost of this improvement is \$150,000.
3. A four-leg intersection with 5th Street. This could encourage the use of 5th Street as a bypass, which is not desired, particularly for trucks. Also, the realignment would occur outside the UGB and would cross farmland, which makes it much more difficult to justify. The estimated cost of this improvement is \$180,000.

SDCs would be the funding source for any of the alternatives. Since the main roadways involved are owned by Clackamas County, some County participation might be possible.

Molalla Forest Road/Main Street

Under the Downtown Bypass scenario, this intersection would need to be realigned so that the Forest Road would become the through route. Because the existing intersection site is located adjacent to a culvert over Bear Creek that constrains any potential widening, and in order to provide a higher-speed curve on the state highway, the intersection location would need to be shifted southwest. Intersection alternatives consist of a conventional "T" intersection, with the realigned state highway the priority road and Main Street stop-controlled, or a modern roundabout similar to the one described above for the Mathias Road/Main Street intersection.

A more detailed analysis of the roadway geometry will be required to determine potential costs, since right-of-way will need to be acquired and a building potentially removed. This improvement would be constructed concurrent to work on the Forest Road and would be funded by SDCs.

Vaughn Road/Highway 211

This intersection has existing sight distance issues for northbound traffic on Highway 211 wanting to turn left onto Vaughn Road. With growth in southeastern Molalla, Vaughn Road will become an attractive alternative to traveling through downtown Molalla, with the result that intersection improvements will need to become a much higher priority. Recommended improvements consist of a northbound left-turn lane and cutting back the bank on the east side of Highway 211 in order to provide better sight distance. This improvement is estimated to cost \$100,000, with funding from the City, County, and ODOT.

Sawtell Road/Molalla Avenue/Wilhoit Road

This is another “Y” intersection that is recommended to become a “T” intersection, particularly if development occurs south of the Forest Road. Although Molalla-Sawtell is the County arterial route, the intersection geometry is better with the Molalla-Wilhoit as the priority route and Sawtell as the stop-controlled leg. This improvement is estimated to cost \$100,000, with funding from the County and/or adjacent development.

Sawtell Road/Eves Road

Sawtell/Eves is another “Y” intersection similar to Sawtell/Molalla/Wilhoit. The west leg is recommended to be the stop-controlled leg. This improvement is estimated to cost \$100,000, with funding provided by the County and/or adjacent development.

Roadway Safety Improvements

Field observations and data provided by Metro identified several safety and geometric problems associated with Molalla’s roadways. These problems were briefly outlined in the existing conditions technical memorandum and include inadequate shoulder width, inadequate roadway width, poor sight distance, and unusual intersection design.

Highway 211 (Main Street)

Highway 211 from Highway 213 to Molalla Avenue was identified as having an inadequate shoulder width. Since Highway 211 is classified as an arterial and is expected to continue to be a major east-west travel corridor, these deficiencies create some safety concerns. Typically, an arterial such as Highway 211 will have a shoulder width requirement of six feet and will include two 12-foot-wide travel lanes. In order to accommodate the extra roadway width, it is recommended that the existing drainage ditches be filled in and replaced with a culvert drainage system. These improvements would create a safer roadway by providing more room for vehicles to maneuver and would also provide space for emergency parking. The estimated cost of this improvement is around \$500,000 per mile. ODOT is the appropriate funding source for this improvement, but the project would likely have a low priority. Some City participation would likely be necessary.

Highway 213

Similar to the deficiencies on Highway 211, Highway 213 from Vick Road to Highway 211 was identified as having an inadequate shoulder width. As regional traffic to and from Molalla increases, it will be necessary to upgrade this stretch of roadway for safety reasons, provide emergency pull off space, and increase driver comfort. To ensure the proper amount of shoulder width, the open ditches should be filled and replaced with a culvert drainage system. This will increase the shoulder width to six feet. The estimated cost of this project is \$500,000 per mile. As with Highway 211, ODOT is the appropriate funding source, but some City participation would likely be needed.

FUNCTIONAL CLASSIFICATION SYSTEM

A roadway’s functional classification determines its role in the transportation system, as well as its width, right-of-way dedications, driveway (access) spacing requirements, types of pedestrian and bicycle facilities provided, and so on. Within the Molalla area, *arterials* represent the highest class of roadway. Arterial roadways are intended to serve higher volumes of traffic, particularly through traffic, and tend to emphasize traffic movement over local land access. At the other end of the scale, *local streets* provide

access to individual parcels and are not intended to carry high volumes of traffic, nor through traffic. *Collector* streets serve a collection and distribution role, gathering traffic from local streets and taking them to arterial streets. Collector streets carry moderate traffic volumes and also serve a local land access function. Molalla also designates some streets as *minor* streets; in other jurisdictions, these are often known as minor collectors. These kinds of streets serve a smaller number of local streets than do major collectors (equivalent to Molalla's collector streets), and carry traffic to other collector streets or to arterials.

The alternative functional classification systems shown in this memorandum proposes a change in terminology to be more consistent with other jurisdictions in northwest Oregon. Collector streets would become *major collectors*, while *minor* streets would become *neighborhood collectors*. Arterial and local street classes would remain the same.

Industrial Access Scenario

Figure 17 shows the proposed functional classification system under the east land use scenario, and using the Forest Road as an industrial access route. The no-bypass scenario is identical, except that the section of the Forest Road between Molalla Avenue and Mathias Road would not be constructed and neighborhood collectors south of the Forest Road would not extend all the way to the Forest Road.

Under this scenario, existing arterial streets would remain as they are now, with Main Street continuing to serve most of the east-west traffic demand. Mathias Road would be upgraded to arterial status between Freyrer Park Road and Main Street to provide a continuous arterial route.

Toliver Road, Mathias Road south of Freyrer Park Road, and Heintz Street east of Molalla Avenue would remain major collectors. Cole Avenue north of Main Street would also remain a major collector and would be extended north to Vaughn to serve new development. South of Main Street, Cole would be downgraded to local street status, as would Heintz Street west of Molalla Avenue. Center Street would become a neighborhood collector. Ridings Avenue would be extended north and south to provide a continuous north-south alternative to Molalla Avenue, and would connect to 5th Street, which would provide a continuous east-west alternative to Main Street. The Molalla Forest Road would be designated as a major collector between Ona Road and Mathias Road, and would connect to the state highway system via Ona Road and a new east-west road in the City's southwest corner.

The minor street system is replaced with a network of neighborhood collectors that provide connections between neighborhoods, but do not provide continuous routes through town to avoid neighborhood cut-through traffic impacts.

Heintz Street east of Molalla Avenue would be completed through to Shirley Street and Shirley would be vacated through the Buckaroo Grounds area. This change directs traffic onto a previously designated collector street (Heintz), rather than a local street (Shirley). It also avoids automobile-pedestrian conflicts during events at the Buckaroo Grounds, as the parking area for the site is located south of Shirley, while the events are held north of Shirley.



NOT TO SCALE

- Functional Classification
-  Arterial
 -  Future Arterial
 -  Collector
 -  Future Collector
 -  Neighborhood Street
 -  Future Neighborhood Street
 -  Local
 -  Future Local
 -  Vacated
 -  Future Local
 -  Urban Growth Boundary

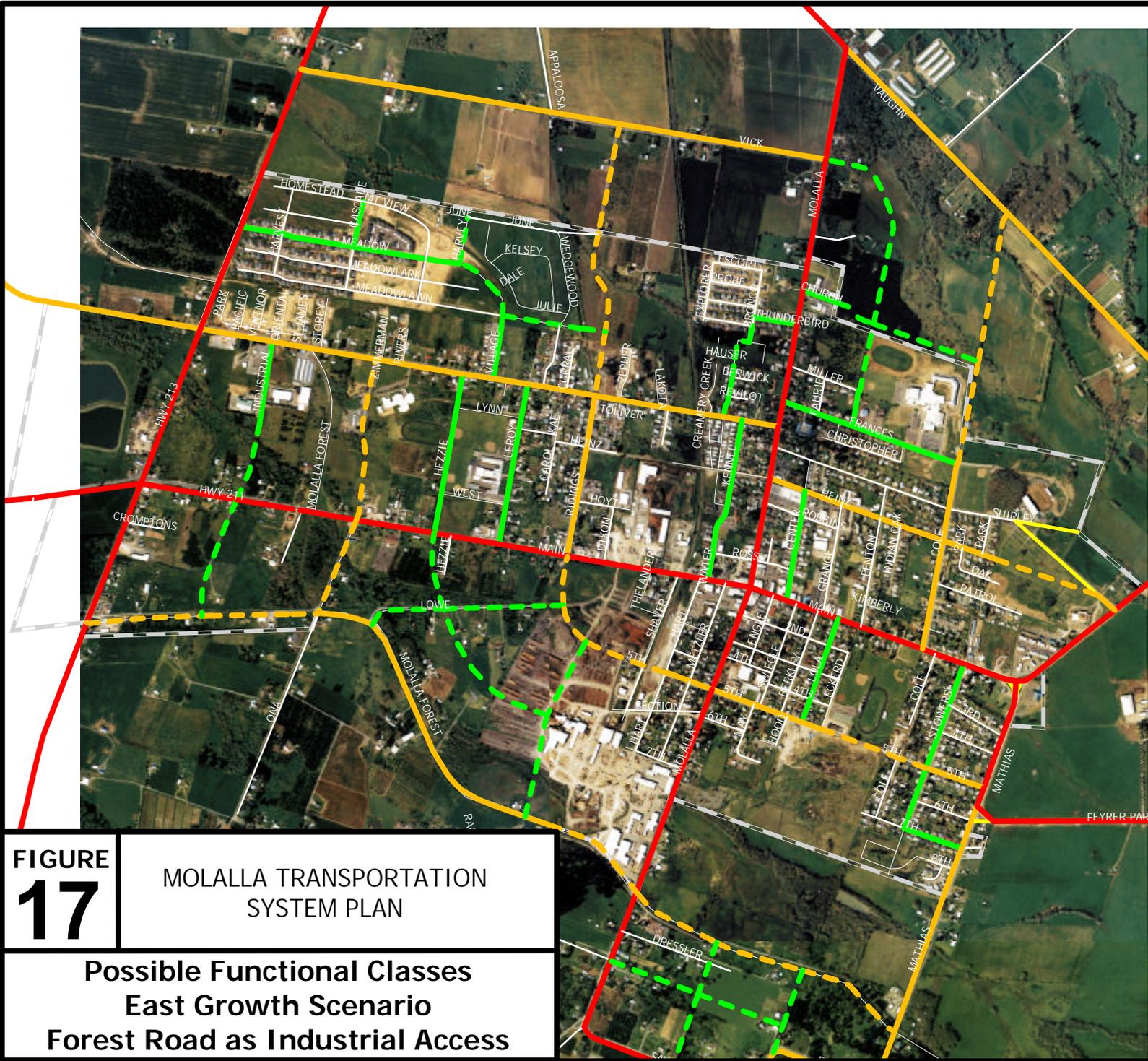


FIGURE
17

**MOLALLA TRANSPORTATION
SYSTEM PLAN**

**Possible Functional Classes
East Growth Scenario
Forest Road as Industrial Access**





NOT TO SCALE

- Functional Classification
-  Arterial
 -  Future Arterial
 -  Collector
 -  Future Collector
 -  Neighborhood Street
 -  Future Neighborhood Street
 -  Local
 -  Future Local
 -  Vacated
 -  Future Local
 -  Urban Growth Boundary

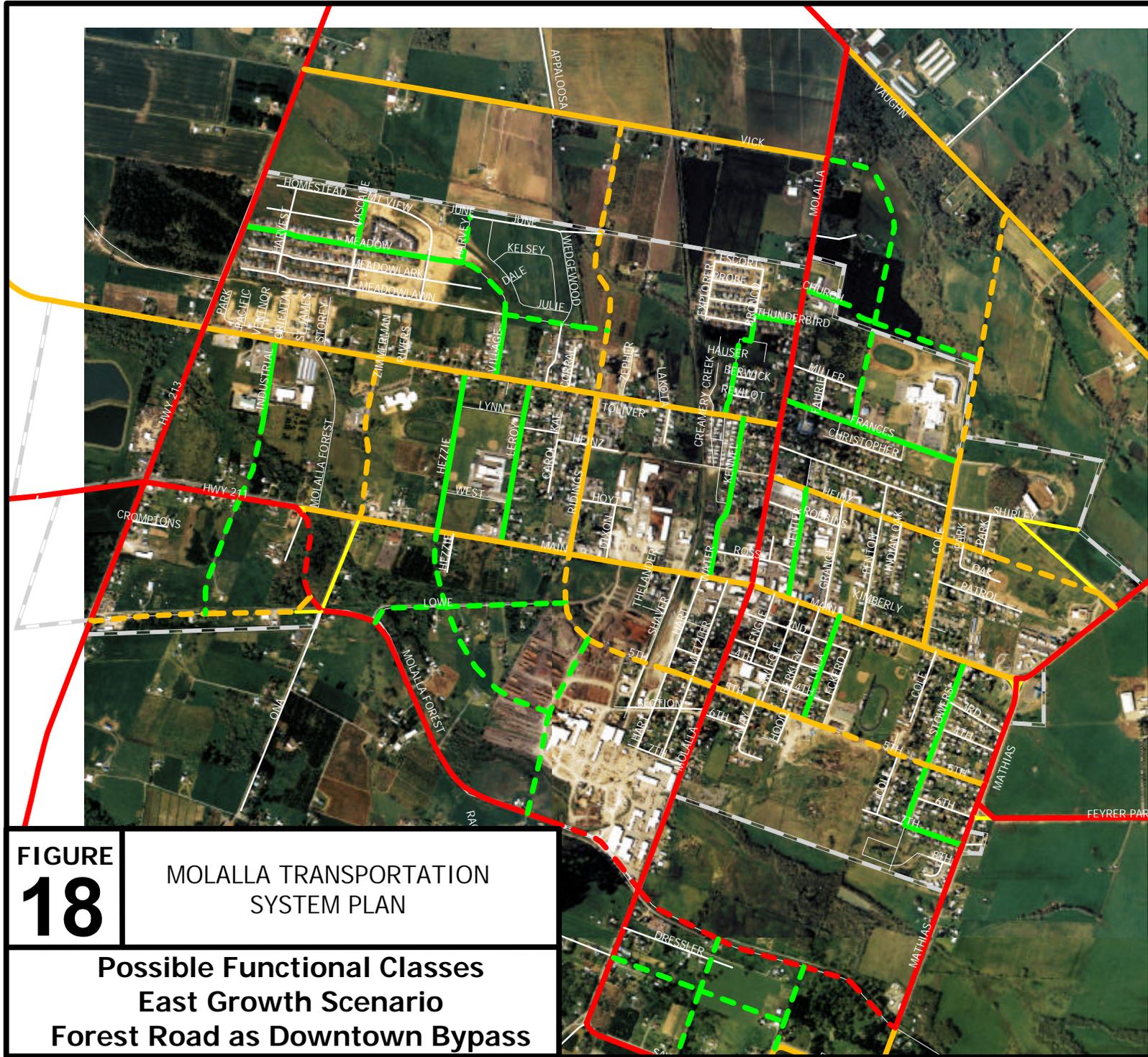


FIGURE
18

**MOLALLA TRANSPORTATION
SYSTEM PLAN**

**Possible Functional Classes
East Growth Scenario
Forest Road as Downtown Bypass**



Downtown Bypass Scenario

This functional classification system proposed for the downtown bypass scenario, and shown in Figure 18, is quite similar to that of the industrial access scenario, with one important exception. Under this scenario, Highway 211 traffic would be routed onto the Molalla Forest Road and Mathias Road, which would become the east-west arterial route around Molalla. Traffic bound for Main Street would be forced to turn off the highway, either at a conventional “T” intersection or at a modern roundabout. Main Street would then be downgraded to major collector status. Under this scenario, Ona Road could be vacated between Main Street and the Forest Road.

Road Widths

Detailed roadway cross-sections are presented in the next section. Table 11 presents design elements that have been incorporated into each of the functional classifications.

**Table 11
 Roadway Design Elements by Functional Classification**

Functional Class	# of Lanes	Lane Striping	On Street Parking	Bike Lanes	Sidewalks
Local	2	No	Yes	No	Yes
Neighborhood Collector	2	Yes	Yes	No	Yes
Major Collector <i>Downtown</i> <i>Rest of City</i>	2 3	Yes Yes	Yes No	No Yes	Yes Yes
Arterial <i>Downtown</i> <i>Rest of City</i>	2 3	Yes Yes	Yes No	No Yes	Yes Yes

As shown in Figure 18, some roadways are expected to require widening to accommodate standard-width (12-foot) travel lanes, bike lanes and sidewalks, and possibly a two-way center turn lane. Priority should be given to widening the arterials and major collectors first, with other improvements to bring facilities up to the new standards having a lower priority. Sidewalks on local streets would be included with new development, but older streets would not be upgraded unless they provide school access or the neighborhood formed a local improvement district. New streets are assumed to be mostly funded by development as it occurs, while widening existing streets would be funded by SDC charges.

Under the Downtown Bypass scenario, access to the Molalla Forest Road should be limited to public street accesses only, except for existing private accesses to existing uses, in order to preserve the function of the road as a bypass. If adjacent land uses change, their access to the Forest Road should be closed and alternative access provided.

Road Widening Costs

Major roadways that would require widening to meet the new standards include the following:

- **Toliver Road:** Toliver Road would be classified as a major collector street consisting of a three lane cross section with bike lanes and sidewalks. The estimated cost of this improvement is approximately \$2,000,000.
- **Molalla Avenue:** Molalla Avenue is a major north-south corridor in Molalla. As an arterial roadway, it should have a three lane cross section, with the exception of the stretch of roadway

that runs through the downtown area where it would remain as a two lane cross section. The estimated cost of these improvements is approximately \$2,500,000.

- **Heintz Avenue extension:** The extension of Heintz Avenue to Shirley Street/Highway 211 is estimated to cost approximately \$800,000. This would bring it up to a three lane cross section consisting of both bike lanes and sidewalks.
- **Molalla Forest Road:** Since the majority of the Molalla Forest Road has been vacated over the recent years and neglected from a maintenance standpoint, there is a need to fully assess the conditions and needs of the roadway in order to determine the costs of bringing it up to current state highway arterial standards. This includes checking the pavement surface, base, foundation, and width conditions as well as the horizontal and vertical roadway alignments. Since this is a major project and out of the scope of work for the TSP, this study will assume that the roadway will require total reconstruction. As a major collector under the Industrial Access scenario, the reconstruction of the Molalla Forest Road to a major collector road is estimated to cost approximately \$3,500,000. As a state highway under the Downtown Bypass scenario, the reconstruction of the Molalla Forest Road to an arterial road is estimated to cost approximately \$4,300,000.
- **Mathias Road:** To bring Mathias Road up to arterial roadway standards, an additional travel lane as well as bike lanes and sidewalks would have to be constructed. The estimated cost of these improvements is approximately \$1,300,000.

PEDESTRIAN AND BICYCLE ALTERNATIVES

The functional classification system shown above creates a pedestrian and bicycle system that is currently lacking in Molalla and would continue to be in the future under a no-build scenario. Sidewalks would be developed on all streets with a neighborhood collector classification or higher, providing a continuous network of pedestrian connections throughout the City. Bicycles would share the travel lane with automobiles on lower-volume and lower-speed streets (local, neighborhood collector, and downtown streets), but would be given separate bicycle lanes on higher-volume and higher-speed sections (major collectors and arterials outside the downtown area).

Under either the No Bypass or the Industrial Access scenarios for the Forest Road, a significant amount of traffic would remain on both Main Street and Molalla Avenue that would need to be accommodated. At the same time, the high volumes of traffic would make it more difficult for pedestrians to cross the streets to get from one part of the City to another. Consequently, a balance would need to be struck between automobile and pedestrian needs. Under these scenarios, the travel lanes would remain at their present width to accommodate through trucks and the higher traffic volumes, but curb extensions (where the sidewalk bulbs out into the parking lane) would be provided at intersections to shorten pedestrian crossing distances. Textured or colored paving materials could be used to indicate pedestrian crossings.

As an alternative to curb extensions, refuge islands could be placed in the center of the street, allowing pedestrians to cross only one direction of traffic at a time. This would require the removal of a significant amount of on street parking adjacent to the intersection. Because of the offset street alignments downtown, particularly along Main Street, this alternative is not recommended downtown, but could be practical in other parts of the City, particularly along the Molalla Forest Road.

Under the Downtown Bypass scenario for the Forest Road, through trucks and a significant percentage of through automotive traffic would be diverted to the bypass, resulting in lower traffic volumes on Main Street. Under this scenario, the travel lanes could be narrowed to promote slower travel speeds and further discourage through traffic. The space gained could be used to provide wider sidewalks, with room in some

areas to add street trees, street furniture, outside restaurant seating, etc., that would make downtown Molalla a more inviting place for pedestrians to visit and wander around. The curb extensions and distinctive pedestrian crossings described for the other scenarios could also be applied for the Downtown Bypass scenario.

FREIGHT MOVEMENT ALTERNATIVES

Under the no-build and No Bypass scenario, trucks would continue to use their existing routes through Molalla. Under these scenarios, removing on street parking along the north side of Main Street west of Molalla Avenue is recommended to provide enough room for trucks to make a left-turn maneuver from Molalla Avenue northbound onto Main Street westbound.

Under the Industrial Access scenario, future truck trips generated in the southern portion of Molalla would be served by the Forest Road, resulting in a smaller increase in the number of truck trips on Main Street. In addition, trucks approaching the City from the south could use the Forest Road to avoid downtown.

Under the Downtown Bypass scenario, all truck trips except local deliveries would use the Forest Road to avoid downtown. This would separate truck traffic from local automobile and pedestrian activity, providing safer and less congested conditions for all. Although the bypass route would increase the distance traveled, the total time required to travel the route might not be much greater, due to higher speeds, no parking activity, minimal pedestrian activity, and fewer access points onto the roadway.

OTHER MODAL ALTERNATIVES

Transit alternatives will be addressed in a separate study commissioned by the South Clackamas Transit District. Most other modes (air, water, pipeline) can accommodate future needs under a no-build scenario and will not require additional improvements. Railroad track improvements would allow higher operating speeds, but no customers currently exist in Molalla that would require these improvements. If the railroad line is ever abandoned, the City should pursue its conversion to a bicycle trail.

PROJECT TEAM RECOMMENDATIONS

The following are the recommendations for the preferred alternative presented by the project team to City staff, the advisory committee and planning commission. This is followed by the preferred alternative selected by this group, which contains several changes from the recommendations presented below.

Land Use Recommendations

The location and amount of future development within the City of Molalla will have a substantial impact on the local transportation system. The two alternative “east” and “west” land use scenarios have shown the need for a variety of intersection and roadway improvements that would be required by the year 2019 in order to maintain acceptable safety and operating conditions. In summary, with the west land use scenario, significant growth will occur along the Highway 213 and Highway 211 corridors, triggering the need for several major intersection and roadway improvements. Under the east land use scenario, the traffic growth would be more evenly distributed throughout Molalla, with increased traffic on Highway 213, Molalla Avenue, Highway 211, and Mathias Road. While this growth scenario will result in a more even distribution of trips, it will also require the need for several additional intersection and roadway improvements because the trips will impact a greater number of intersections as they pass through town. However, this traffic growth would occur closer to the downtown core area, resulting in a more compact and self-contained community.

From a transportation perspective, the east land use scenario is a recommended option because it emphasizes a more compact community where vehicle trips within the city are shorter and alternative modes of transportation such as bicycling and walking are more attractive. Longer-distance commute trips can be accommodated by several alternative routes, although improvements will be required to each route over time. Since the east growth scenario is the planning commission's preferred growth scenario, all further intersection and functional classification recommendations in this memorandum will conform to this scenario.

Molalla Forest Road Recommendations

In order to place more of an emphasis on the Molalla downtown core area as a shopping destination and to promote a friendlier pedestrian environment, it is recommended that the Molalla Forest Road be used as a downtown bypass. This would allow through traffic including through trucks to completely avoid several important intersections, particularly the Molalla Avenue/Main Street intersection. Access to the Molalla Forest Road should be limited to public street accesses only, except for existing private accesses to existing uses, in order to preserve the function of the road as a bypass. If adjacent land uses change, their access to the Forest Road should be closed and alternative access provided.

While bypassing the majority of through traffic around the downtown core area is beneficial from a safety, roadway maintenance, and quality of life perspective, it should also be noted that this recommendation is a large project that would require extensive roadway reconstruction efforts and would dwarf all of the other roadway projects in terms of costs. Other issues include an increase in traffic adjacent to the residential areas along Mathias Road and the fact that a bypass will not eliminate the need for a traffic signal at the Main Street/Molalla Avenue intersection. Despite these drawbacks, the need for the Forest Road as a bypass will ultimately promote better east-west circulation, allow the downtown core area to maintain and enhance its vitality, and help reduce roadway maintenance and noise caused by heavy trucks.

Intersection Recommendations

With the east growth scenario and Molalla Forest Road used as a downtown bypass, the resulting traffic growth will require the need for the following recommended intersection improvements.

Vick Road/Highway 213

To restore an acceptable LOS "E" to this intersection, southbound and westbound left-turn lanes are recommended. These lanes will allow vehicles to stack without impeding the other movements, particularly the southbound through movement on Highway 213.

Meadow Drive/Highway 213

As a result of traffic growth generated by the Big Meadow subdivision, a traffic signal is recommended at this intersection to restore an acceptable LOS "B." Signalization of this intersection is dependent upon when the Big Meadow subdivision reaches full build-out. Until that time, traffic volumes should be monitored closely to ensure traffic operations and safety are not compromised during the peak periods. (*Note: The addition or modification of a traffic control device on any ODOT facility requires the approval of the State Traffic Engineer.*)

Toliver Road/Highway 213

As growth in eastern Molalla increases, the amount of southbound through trips at this intersection will require the need for signalization of this intersection. It is recommended that a signal be installed and left-

turn lanes be constructed on all approaches to the intersection. This improvement is recommended for implementation in the near-term future. *(Note: The addition or modification of a traffic control device on any ODOT facility requires the approval of the State Traffic Engineer.)*

Highway 211/Highway 213

Since Highway 211 and Highway 213 are forecast to handle the majority of traffic traveling into and out of Molalla over the next twenty years, several intersection improvements have been recommended. These improvements include signaling the intersection, constructing left-turn lanes on all approaches, and adding a northbound and westbound right-turn lane. While growth in eastern Molalla will contribute to the number of trips through this intersection, it is expected that growth from nearby commercial developments will generate a significant amount of new trips. It is recommended that these intersection improvements be coordinated on an as-needed basis with the development of adjacent commercial parcels. *(Note: The addition or modification of a traffic control device on any ODOT facility requires the approval of the State Traffic Engineer.)*

Molalla Avenue/Main Street

With the Molalla Forest Road used as a downtown bypass, all of the through vehicles and through truck traffic will avoid this intersection. However, enough shopping related trips will still exist at this intersection to warrant improvements. It is recommended that a signal be installed at the intersection and northbound and southbound left-turns be restricted. By restricting these left-turns, the provision of on street parking can continue within the downtown area, travel lanes can be narrowed to promote wider sidewalks and allow for pedestrian amenities, and the downtown area can achieve a more inviting streetscape. It should be noted that the implementation of the restricted left-turn recommendation is contingent upon the development of Ridings Avenue and Heintz Street as viable left-turn alternative routes.

Molalla Avenue/Heintz Street

Growth in eastern Molalla will result in an increase in southbound traffic through this intersection. To restore acceptable traffic operations, it is recommended that a traffic signal be installed at this intersection. With the restriction of southbound left-turns at the intersection of Molalla Avenue/Main Street, a southbound left-turn lane is also recommended.

Molalla Avenue/Toliver Road

Similar to the intersection at Molalla Avenue/Heintz Road, growth in eastern Molalla will increase the number of southbound trips through this intersection. To ensure the smooth and efficient operation of traffic at this intersection, it is recommended that a traffic signal be installed. Since it is not exactly clear when a traffic signal will be needed, it is also recommended that this intersection be monitored to ensure traffic operations and safety are not compromised during the p.m. peak period.

Mathias Road/Main Street

Due to the projected increase in traffic at this intersection, it is recommended that the current “Y” intersection be redesigned to a more conventional “T” intersection. With the development of the Forrest Road as a bypass, the Main Street approach should be stopped controlled, giving priority movements to northbound and southbound traffic on Mathias Road.

Mathias Road/Freyrer Park Road

The unusual geometry of this intersection creates multiple vehicle conflict points and will become an increasing hazard as vehicle trips increase along Mathias Road. To improve intersection safety and design, a more conventional intersection is recommended. By realigning the westbound approach of Freyrer Park Road with the 6th Street/Mathias Road intersection, a four-leg intersection would be created. The east and westbound approaches on 6th Street and Freyrer Park Road should be stop controlled.

Molalla Forest Road/Main Street

To encourage the use of the Forest Road as a downtown bypass, it is recommended that this intersection be realigned so that the Forest Road would become the through route. This would involve the use of a conventional “T” intersection with the westbound approach on Main Street stop controlled. To determine the exact design and potential costs of such an improvement, it is also recommended that a more detailed analysis of the roadway improvements be implemented.

Vaughn Road/Highway 211

It is recommended that a northbound left-turn lane be installed at this intersection to improve future traffic operations. To improve vehicle sight distance along Highway 211, the bank on the east side of the roadway should also be cut back.

Sawtell Road/Molalla Avenue/Wilhoit Road

With the possibility of significant development oriented growth south of the Forrest Road, it is recommended that the current “Y” intersection be redesigned to become a “T” intersection. For geometric reasons, it is recommended that the Sawtell Road leg be stop controlled and the Molalla Avenue/Wilhoit Road legs be the priority route.

Sawtell Road/Eves Road

Similar to the improvements for the Sawtell Road/Molalla Avenue/Wilhoit Road intersection, the existing “Y” intersection is recommended to become a “T” intersection with the Sawtell Road leg stop controlled. This improvement will be contingent upon expected residential build-out in the southeastern portion of Molalla.

Safety Improvement Recommendations

Highway 211 (Main Street)

With the development of the Forrest Road as a downtown bypass, a significant amount of traffic will be rerouted from Highway 211 reducing its role as the predominate east-west travel corridor. However, for the sections of Highway 211 to the east of the Forrest Road, it is recommended that Highway 211 be reconstructed to include two twelve foot wide travel lanes, a center left-turn lane, bike lanes, and sidewalks. These improvements will reduce the hazards associated with the existing narrow travel lanes and lack of shoulder width. To accommodate the extra roadway width, it is recommended that the existing open drainage ditches be filled in and replaced with a culvert drainage system.

Highway 213

As regional traffic to and from Molalla increases, it is recommended that this stretch of roadway from Highway 211 to Vick Road be upgraded to include the addition of a center turn lane and extra shoulder

width. These improvements will enhance the safety concerns associated with narrow roadways, provide emergency pull off space, and increase driver comfort. To ensure the proper amount of shoulder width, the open ditches should be filled and replaced with a culvert drainage system.

Pedestrian and Bicycle Recommendations

Under the Downtown Bypass scenario for the Forest Road, through trucks and a significant percentage of through automotive traffic would be diverted to the bypass, resulting in lower traffic volumes on Main Street. With this reduction in traffic volumes, it is recommended that the travel lanes be narrowed on Main Street to promote slower travel speeds and further discourage through traffic. The space gained would be used to provide wider sidewalks, with room in some areas to add street trees, street furniture, outside restaurant seating, etc., that would make downtown Molalla a more inviting place for pedestrians to visit. The curb extensions and distinctive pedestrian crossings are also recommended for the intersection of Molalla Avenue and Main Street to increase pedestrian safety.

Outside of the downtown area, it is recommended that sidewalks be developed on all streets with a neighborhood collector street classification or higher. This will provide a continuous network of pedestrian connections throughout the city. To provide bicycle connections, it is also recommended that bicycle lanes be constructed on all high-volume, high-speed sections of major collector and arterial roadways.

Functional Classification Recommendations

Several major recommendations have been made to Molalla's functional classification hierarchy. These recommendations are listed below:

- With the Molalla Forest Road serving as an east-west arterial route around Molalla, its functional classification should be upgraded to arterial status.
- With Main Street east of the Forest Road no longer serving as the primary east-west arterial, it should be downgraded to a major collector street.
- Mathias Road should be upgraded to an arterial street between the Forest Road and Main Street. This will provide a continuous arterial route around Molalla.
- To serve new development and provide continuous north-south and east-west major collector corridors, it is recommended that Cole Street be extended to Vaughn Road and Heintz Street be extended to Highway 211.
- To provide a continuous north-south alternative to Molalla Avenue, Ridings Avenue should be extended south of Main Street to 5th Street and north of Toliver Road to Vick Road. This will allow it to be upgraded to major collector status.
- Heintz Street east of Molalla Avenue should be completed through to Shirley Street and Shirley should be vacated through the Buckaroo Grounds area. This change directs traffic onto a previously designated collector street (Heintz), rather than a local street (Shirley). It also avoids automobile-pedestrian conflicts during events at the Buckaroo Grounds, as the parking area for the site is located south of Shirley, while the events are held north of Shirley.

PREFERRED ALTERNATIVE

Based on City staff direction, two changes were made to the project team's recommended alternative, as described below. The project advisory committee requested that one additional intersection be addressed because of safety issues. Finally, "neighborhood collectors" were redesignated as "neighborhood streets", and some changes were made to the functional classifications of other streets in order to comply with federal funding guidelines that came into effect between the time the recommended alternative was developed and when the TSP hearings process commenced. (Only those facilities designated as Major Collector or above are eligible for federal emergency relief funds, and only a certain percentage of streets can be designated as collectors.)

First, the connection between 5th and Ridings has been moved to connect to Leroy, instead, because of the new BiMart development that occurred on the south side of Main Street, preventing Ridings from being extended south of Main Street. The possibility exists to connect a future local street to the back of the shopping center. As a result of this change, the future traffic signal originally proposed for the Ridings/Main Street intersection has been shifted to the Leroy/Main Street intersection, instead. This change still provides a continuous east-west alternative to Main Street, but prevents a continuous north-south alternative to Molalla Avenue from the residential areas on the north side of the city to the areas south of Main Street.

Second, the extension of Heintz street east to Shirley has been removed, because the City plans a park and swim center in that area. As a result of this change, Shirley has been designated as a major collector street, a future traffic signal is shown at the Molalla/Shirley intersection, and a street reconstruction project is shown for Shirley to address the existing poor pavement conditions.

Finally, the project advisory committee requested that safety issues associated with the closely spaced intersections of Main Street with Grange Street and Berkley Avenue be reviewed. Potential project alternatives for this intersection, which involve a pedestrian refuge and turn restrictions, are presented in the next section.

Section 5

Transportation System Plan

Transportation System Plan

INTRODUCTION

This section presents the individual elements of the City of Molalla Transportation System Plan. The TSP addresses those components necessary for the development of the future transportation network including:

- Preferred Land Use Plan
- Roadway Plan
- Pedestrian Plan
- Bicycle Plan
- Marine Transportation Plan
- Air/Water/Pipeline System Plan
- Access Management Plan
- Implementation Plan

The transportation components presented in this section were developed in accordance with the requirements of Oregon's Transportation Planning Rule. These recommendations have been developed in accordance with the findings presented in the existing and future forecast conditions analysis, the alternatives analysis, and the interests of the citizens, business owners, and governmental agencies within the City of Molalla, as expressed by the advisory committee, planning commission, and citizen input during project meetings.

PREFERRED LAND USE PLAN

The City should consider an expansion of the UGB along the City's southeast, northeast, and north central edges at the time it next updates its comprehensive plan, in order to accommodate the City's anticipated growth over the next 20 years. These directions are the ones preferred by the project advisory committee. Because not all of the potential environmental and other constraints associated with UGB expansions in these areas are known at present, the functional classification plan presented below does not show future streets outside the UGB. Instead, street stub locations are shown extended to the edge of the existing UGB in order to preserve potential future connections. If and when UGB expansions do occur, the sample functional plans shown in the alternatives analysis section of this TSP can be used for guidance in developing a connected street system in the expansion areas.

The City should also commit to preserving right-of-way for local street connections whenever applications for new development or redevelopment are presented to the City.

ROADWAY SYSTEM PLAN

The City of Molalla's roadway system plan provides guidance on how to best facilitate roadway travel over the next 20 years. This plan was based on the identified existing and anticipated future operational and circulation needs. The plan was completed in two steps. First, the current functional classification system was reviewed, and recommendations were made for new classifications and design standards associated with each facility type. Based on this initial step, roadway cross-sections and design standards are proposed for the future modernization of existing roadways, and the future construction of new

roadways. Second, the key issue of roadway connectivity was addressed, to provide for adequate future roadway capacity, circulation, and safety.

Functional Classification Plan

The purpose of classifying roadways is to create a mechanism through which a balanced transportation system can be developed that facilitates mobility for all modes of transportation. A roadway's functional classification determines its intended purpose, the amount and character of traffic it is expected to carry, the degree to which non-auto travel is emphasized, and the roadway's design standards. It is imperative that a roadway's classification considers the adjacent land uses and the transportation modes that should be accommodated. The public right-of-way must also provide sufficient space for utilities to serve adjacent land uses. The functional classification plan for the City of Molalla incorporates four functional categories: arterials, collectors (major and minor), neighborhood streets, and local streets.

Arterials

Arterials are roadways that are primarily intended to serve traffic entering and leaving the urban area. While arterials may provide access to adjacent land, that function is subordinate to the travel service provided to major traffic movements. Arterials are the longest-distance, highest-volume roadways within the urban growth boundary. Although the streets focus on serving longer distance trips, pedestrian and/or bicycle activities often are also associated with the arterial streetscape.

Collectors

Collector streets facilitate the movement of city traffic within the urban growth boundary of the city. Collectors provide some degree of access to adjacent properties, while maintaining circulation and mobility for all users. Major collectors are distinguished by their connectivity and higher traffic volumes, although they are designed to carry lower traffic volumes at slower speeds than arterials. Major collector streets are characterized by two or three-lane facilities. Minor collectors carry lower volumes than major collectors and have two-lane cross-sections.

Neighborhood Streets

The primary function of neighborhood streets is to connect neighborhoods with the collector and arterial street system, facilitate the movement of local traffic, and provide access to abutting land uses. Speeds on these facilities should remain low to ensure community livability and safety for pedestrians and bicyclists of all ages. On-street parking is more prevalent and pedestrian amenities are typically provided. Striped bike lanes are unnecessary for most neighborhood streets because the traffic volumes and speeds should allow cyclists to travel concurrently with motorists.

Local Streets

Local streets are primarily intended to provide access to abutting land uses. Local street facilities offer the lowest level of mobility and consequently tend to be short, low-speed facilities. As such, local streets should primarily serve passenger cars, pedestrians, and bicyclists; heavy truck traffic should be discouraged. On-street parking is common and sidewalks are typically present.

Figure 19 presents the functional classifications for all existing streets and proposed future collector and arterial streets within the existing UGB. The alignments for future streets should be considered conceptual: the end points of the streets are fixed, but the alignments between intersections may vary depending on design requirements at the time the street is constructed. Street stub connections to the UGB

boundary are indicated by arrows. Table 12 presents a summary of the streets assigned to each functional classification.

**Table 12
Functional Classification System Summary**

Arterials	Collectors	Neighborhood Streets		Local Streets
Highway 213	Major Collectors	Cascade Avenue*	Kennel Avenue	All remaining streets
Highway 211*	Main Street	Harvey Avenue	Water Avenue	
Molalla Forest Road	Toliver Road	Julie Street	Heintz Street	
Mathias Road	Shirley Street	Toliver Drive	Center Avenue*	
Molalla Avenue	Leroy Avenue	Bronco Avenue*	Lola Avenue	
Freyrer Park Road	5 th Street	Thunderbird Street	Stowers Avenue*	
	Minor Collectors	Church Street	7 th Street*	
	Ridings Avenue	Frances Street	Hezzie Avenue	
	Cole Avenue	south industrial area	Industrial Avenue	
	Frances Street	Lowe Street	Ona Road*	

*portion of the street—see Figure 19

Street Design Standards

Street design standards are based on the functional and operational characteristics of streets such as travel volume, capacity, operating speed, and safety. The standards also are established to provide appropriate separation between travel lanes and pedestrian and bicycle facilities. They are necessary to ensure that the system of streets, as it develops, will be capable of safely and efficiently serving the traveling public while also accommodating the orderly development of adjacent lands.

The proposed street design standards are shown in Figure 20. The typical roadway cross sections comprise the following elements: right-of-way, number of travel lanes, bicycle and pedestrian facilities, and optional amenities such as landscape strips. Detailed design elements, such as cross-slopes, are not shown in this figure, but should be added when the City updates its standard engineering drawings. Also, additional width for turn lanes may be needed at specific intersections based on an engineering investigation; these are not shown in the street design standards, which address the portions of streets between intersections. Figure 20 is intended to be used for for planning purposes for new road construction, as well as for those locations where it is physically and economically feasible to improve existing streets.

Two cross-sections are identified for arterials and major collectors, one for the downtown area and one for the rest of the City. The cross-section for the non-downtown areas (Option A) is designed to accommodate longer-distance, higher-speed traffic; turning movements into adjacent land uses that provide off-street parking; and separation of bicycles from vehicular traffic. The downtown cross-section (Option B) is designed to preserve on-street parking for the businesses in the area and provides wider sidewalks to encourage pedestrian travel in downtown.



NOT TO SCALE

- Functional Classification
- Arterial
 - - - Future Arterial
 - Major Collector
 - - - Future Major Collector
 - Minor Collector
 - - - Future Minor Collector
 - Neighborhood Street
 - - - Future Neighborhood Street
 - Local Street
 - - - Local Street/
Vacated in future
 - Future Local Street
 - - - Urban Growth Boundary

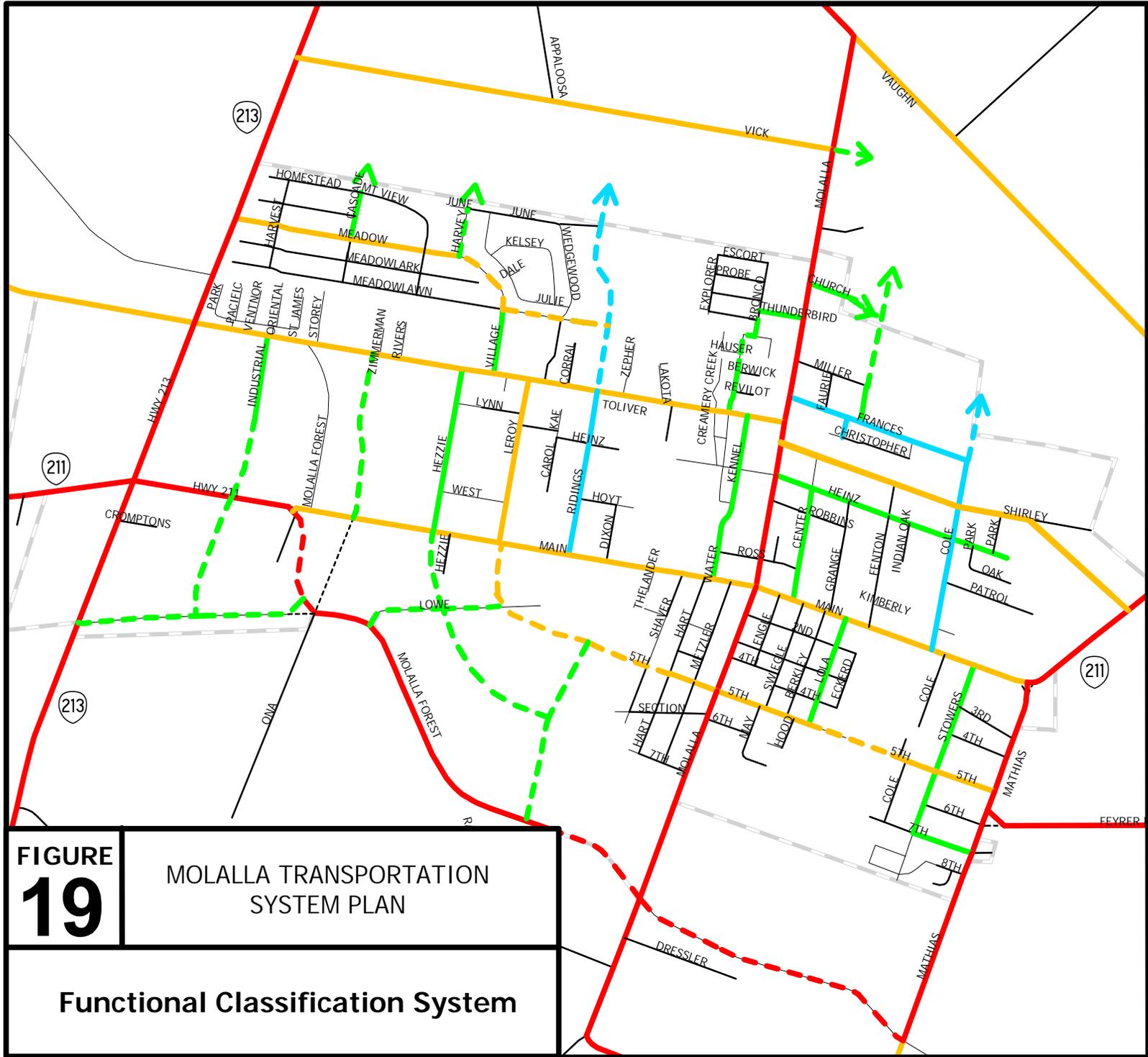
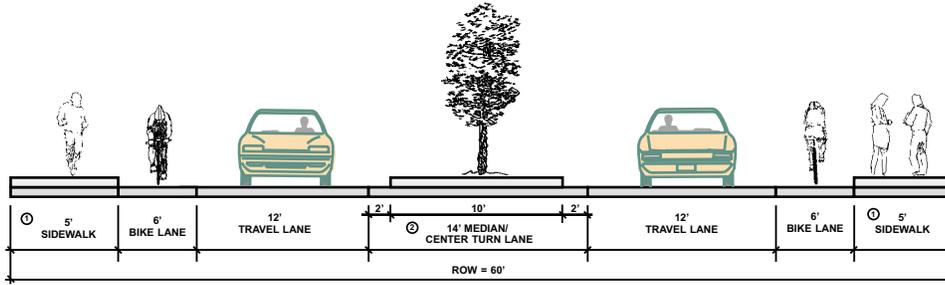


FIGURE
19

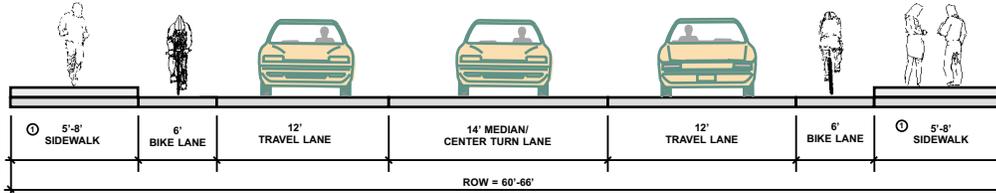
MOLALLA TRANSPORTATION
SYSTEM PLAN

Functional Classification System

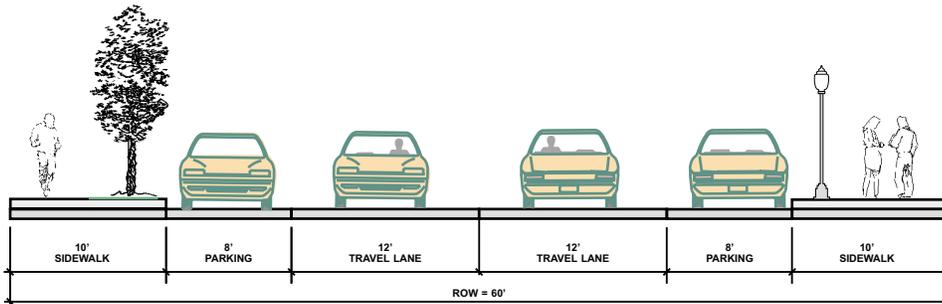




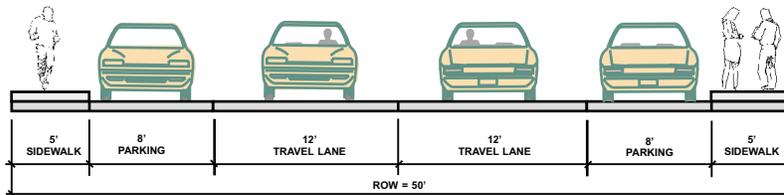
MOLALLA FOREST ROAD



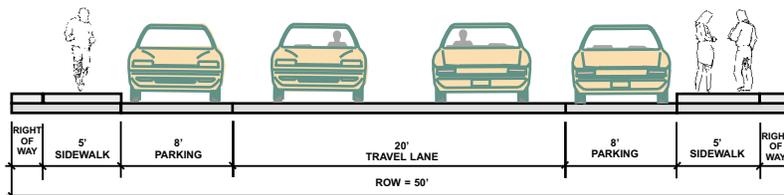
**ARTERIAL/MAJOR COLLECTOR
(OPTION A)**



**ARTERIAL/MAJOR COLLECTOR
DOWNTOWN (OPTION B)**



MINOR COLLECTOR/NEIGHBORHOOD STREET



LOCAL STREET

NOTE: ROW = RIGHT OF WAY

1. 8' wide sidewalks should be used in all C1 and C2 zoned areas outside of the downtown area. 5' wide sidewalks may be used everywhere else.

2. Replace with a 14' wide turn lane at intersections.

* These drawings show roadway cross-sections as they pertain to typical roadway characteristics and lane spacing standards. Refer to city engineering diagrams for detailed geometric design plans.

STREET CROSS-SECTIONS

TRANSPORTATION SYSTEM PLAN
CITY OF MOLALLA, OREGON

FIGURE
20



Other elements unique to particular functional classifications include the following. A raised median is shown for the Molalla Forest Road, replaced by left-turn lanes at intersections with public roadways. The City’s subdivision ordinance calls for eight-foot sidewalks in C-1 and C-2 commercially zoned areas; this additional sidewalk width has been incorporated into the cross-sections shown in Figure 20. A two-foot strip of right-of-way on local streets can be used as a landscaping strip next to the adjacent property line, as well as space for utility poles and other public utilities. The adjacent resident would typically maintain the landscaping as part of their property (i.e., lawns, etc.).

Table 13 presents the standards in tabular form.

**Table 13
Street Design Standards Summary**

Classification	Cross Section	Minimum Right-of-Way	Center Turn Lanes?	Travel Lanes	Bike Lanes?	Sidewalks?	On-Street Parking	Land-scape Strip
Local	2 Lanes	50 feet	No	Not striped	No	5 foot	Yes	Yes
Neighborhood Street Minor Collector	2 Lanes	50 feet	No	12 foot	No	5 foot	Yes	No
Major Collector - Downtown - Rest of City	2 Lanes 3 Lanes	60 feet 60 feet	No Yes	12 foot 12 foot	No 6 foot	10 foot 5-8 foot*	Yes No	No No
Arterial - Downtown - Rest of City - Molalla Forest Road	2 Lanes 3 Lanes 2 lanes + median	60 feet 60 feet 60 feet	No Yes Raised median	12 foot 12 foot 12 foot	No 6 foot 6 foot	Yes Yes Yes	Yes No No	No No No

*8 feet in C-1 and C-2 zones; 5 feet elsewhere

Other Considerations

The availability of streetscape treatments such as landscape strips, pedestrian refuges and bike lanes will prove valuable to the city as instruments by which the character of roadways can be influenced. Streetscape treatments such as street trees can be used to reduce the perceived impact a roadway has on the community. Narrower streets or streets that have a “skinny” feel due to the presence of closely spaced trees or buildings that are designed with minimal setbacks may also be desirable in some neighborhood areas for use as a deterrent to through or speeding traffic on local streets.

Special considerations for school zones is necessary and require reduced speed limits during the hours when children are going to and from school and during special events. School speed zoning—as well as all other types of speed zoning throughout the state—is set by the ODOT Traffic Management Section and the Speed Zone Review Panel.

Guidelines for Arterial/Collector Intersection Improvements

In addition to roadway cross-section standards, the city should adopt standards for intersection improvements. As intersection improvements are made at arterial/collector intersections in the city, the following general guidelines should be considered:

- maintain adequate signing of side-streets (stop signs and visible street signs);
- restrict parking and potential sight obstructions in the intersection vicinity;
- provide intersection illumination to increase visibility;

- provide proper channelization (striping, raised medians, etc.) of movements;
- provide a paved apron on unpaved side-street approaches to create a smooth transition to and from the main street; and
- install right-turn transition tapers at high-speed unsignalized intersections and tapers with storage lanes at signalized intersections on highway approaches (the standard designs identified in the ODOT Design Manual should be used when addressing intersections along state highways).

ROADWAY IMPROVEMENT PROGRAM

The required roadway improvements needed in Molalla over the next 20 years to accommodate future growth and address existing safety problems were identified in the alternatives analysis section. The summary portion found later in this section describes each of the roadway improvement projects.

ACCESS MANAGEMENT STRATEGIES

As the City of Molalla continues to grow, its street system will become more heavily traveled. Consequently, it will become increasingly important to manage access on the arterial and major collector street system as new development occurs, in order to preserve those streets' function for carrying through traffic.

The Oregon Transportation Planning Rule (TPR) defines access management as a set of measures regulating access to streets, roads, and highways, from public roads and private driveways. The TPR requires that new connections to arterials and state highways be consistent with designated access management categories. This TSP has developed an access management policy that maintains and enhances the integrity (capacity, safety, and level of service) of the city's streets. The Oregon Department of Transportation has legal authority to regulate access points along Highway 213 and Highway 211 within the city's urban growth boundary. The City of Molalla manages access on other collector and local streets within its jurisdiction to ensure the efficient movement of traffic and enhance safety.

Access management standards vary depending on the functional classification and purpose of a given roadway. Roadways on the higher end of the functional classification system (i.e., arterials and major collectors) tend to have higher spacing standards, while facilities such as neighborhood and local streets allow more closely spaced access standards. These standards apply to new development or redevelopment; existing accesses are allowed to remain as long as the land use does not change. As a result, access management is a long-term process in which the desired access spacing to a street slowly evolves over time as redevelopment occurs. It should also be kept in mind that parcels cannot be land-locked, but must have some way of accessing the public street system. This may mean allowing shorter access spacings than would otherwise be allowed, but the possibility of providing shared access with a neighboring parcel should also be explored.

The following discussion presents the hierarchical access management system for roadways in the Molalla urban growth boundary.

ODOT Access Management Standards

All local transportation system plans adopted after January 1, 2000 are subject to the Access Management Policies outlined in the *1999 Oregon Highway Plan*. This plan specifies an access management classification system for state facilities based on a highway classification system. The *1999 Oregon Highway Plan* classifies Highways 211 and 213 as District Highways. Future developments along Highway 213 and Highway 211 (new development, redevelopment, zone changes, and/or comprehensive

plan amendments) will be required to meet the 1999 Oregon Highway Plan Access Management policies and standards. Table 14 summarizes ODOT's access management standards for district highways under the *1999 Oregon Highway Plan*.

Table 14
Highway 213 and Highway 211 ODOT Access Management Standards

Posted Speed	Spacing Standards (feet)*	Spacing Standards for Areas Designated as UBAs	Spacing Standards for Areas Designated as STAs
≥55	700	-	-
50	550	-	-
40 & 45	500	-	-
30 & 35	400	350	300**
≤25	400	350	300**

*Measurement of the approach road spacing is from the center on the same side of the roadway

**Minimum spacing standards for public road approaches is the existing city block spacing (approximately 300 feet in Molalla); private driveway spacing is a minimum of 175 feet.

Variance Process

Access variances may be provided to parcels whose highway frontage, topography, or location would otherwise preclude issuance of a conforming permit and would either have no reasonable access or cannot obtain reasonable alternate access to the public road system. In such a situation, a conditional access permit may be issued by ODOT or the City of Molalla, as appropriate, for a single connection to a property that cannot be accessed in a manner that is consistent with the spacing standards.

The permit should carry a condition that the access may be closed at such time that reasonable access becomes available to a local public street. The approval condition might also require a given land owner to work in cooperation with adjacent land owners to provide either joint access points, front and rear cross-over easements, or a rear access upon future redevelopment. In addition, approval of a conditional permit might require ODOT-approved turning movement design standards to ensure safety and managed access.

Special Transportation Area

Within the *Oregon Highway Plan*, provisions have been made to accommodate central business districts and other activity centers oriented to non-auto travel in which growth management considerations outweigh access spacing policy. Specifically, the *Oregon Highway Plan* allows for the designation of Special Transportation Areas (STAs) for compact areas on a state highway in which growth management considerations outweigh the need to limit access. Inclusion in an STA allows for redevelopment to occur with access less than the standard spacing. STA designations do not apply to whole cities or strip development areas along individual highway corridors.

Within downtown Molalla, the section of Highway 211 between Hart Avenue and Grange Street is a potential STA, as shown in Figure 21. If the City so chooses, it can work with ODOT to develop a management plan for the STA, as described in the *Oregon Highway Plan*. Although in the long term, once the bypass is built, Main Street may no longer be a state highway, the City can use the STA designation in the short term to potentially qualify for funding for pedestrian and bicycle improvements in the STA.

It is recommended that the City of Molalla and ODOT work together with the downtown business community and citizens of Molalla to develop an STA management plan for Highway 211 (Main Street) in the Molalla downtown area. This section of Main Street should provide for low traffic speeds and a high-quality, inviting pedestrian and bicycle environment, while preserving on-street parking and access to local businesses.

Urban Business Area

The sections of Highway 211 within and close to the existing city limits that are designated for commercial uses in the current land use plan are potential future Urban Business Areas. Specifically, these sections are located between Hezzie Avenue and Dixon Avenue, and between Cole Street and a point northeast of Mathias Street, as shown in Figure 21. At present, a lack of local street connections works against their designation as UBAs, but this situation can change over time if the City works with new development to create more local street connections.

City Access Standards

Table 15 identifies the minimum public street intersection and private access spacing standards for the City of Molalla roadway network as they relate to new development and redevelopment. Table 16 identifies standards for private access driveway widths. In cases where physical constraints or unique site characteristics limit the ability for the access spacing standards listed in Tables 15 and 16 to be met, the City of Molalla should retain the right to grant an access spacing variance. County facilities within the city's urban growth boundary should be planned and constructed in accordance with these street design standards.

Table 15
Minimum Intersection Spacing Standards

Functional Classification	Public Street (feet)	Private Access Drive (feet)
Local Street	150	50
Neighborhood Collector	300	100
Major Collector/Arterial*	600	150
Molalla Forest Road	800	**

*ODOT standards supercede these values on ODOT facilities

**not allowed unless no other access possible. Access may be limited to right-in, right-out.

Table 16
Private Access Driveway Width Standards

Functional Classification	Minimum (feet)	Maximum (feet)
Single Family Residential	12	24
Multi-Family Residential	24	30
Commercial	30	40
Industrial	30	40

Management Techniques

From an operational perspective, the City of Molalla should consider implementing access management measures to limit the number of redundant access points along roadways. This will enhance roadway capacity and benefit circulation. Improvements that should be considered include:

- planning for and developing intersection improvement programs in order to regularly monitor intersection operations and safety problems;
- purchasing right-of-way and closing driveways; and
- installing positive channelization and driveway access controls as necessary.

Enforcement of the access spacing standards should be complemented with the provision of alternative access points. Purchasing right-of-way and closing driveways without a parallel road system and/or other local access could seriously effect the viability of the impacted properties. Thus, if an access management approach is taken, alternative access should be developed prior to “land-locking” a given property.

As part of every land use action, the City of Molalla should evaluate the potential need for conditioning a given development proposal with the following items, in order to maintain and/or improve traffic operations and safety along the arterial and collector roadways.

- Crossover easements should be provided on all compatible parcels (considering topography, access, and land use) to facilitate future access between adjoining parcels.
- Conditional access permits should be issued to developments having proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing driveways.
- Right-of-way dedications should be provided to facilitate the future planned roadway system in the vicinity of proposed developments.
- Half-street improvements (sidewalks, curb and gutter, bike lanes/paths, and/or travel lanes) should be provided along site frontages that do not have full build-out improvements in place at the time of development.

PEDESTRIAN AND BICYCLE SYSTEM PLAN

Providing connections between major activity centers is a key objective of the pedestrian and bicycle system plans. Major activity centers are defined to be facilities that typically attract high levels of pedestrian activity on a regular basis. Within the City of Molalla, these activity centers include the downtown core area centered around the intersections of Molalla Avenue and Main Street, Molalla River Middle School, Molalla Elementary School, Molalla High School, and the Molalla Buckaroo Grounds. Future activity centers include the relocated library and a future swim center.

Pedestrian System Components

Under the pedestrian plan, sidewalks should be provided along all major roadways in order to develop a comprehensive sidewalk system throughout the city. It is essential that existing sidewalks be connected to new sidewalks as new developments are constructed or as road improvements are made. The street design standards shown in Figure 20 will ensure that pedestrian facilities are provided in conjunction with all new or substantially reconstructed arterials, major collectors, neighborhood collectors, and local streets.

The following elements are key components of the pedestrian system plan:

- The provision of a sidewalk network from the Molalla High School campus to the adjacent existing residential neighborhoods located to the south and future residential development located to the north and east.
- The continued development and enhancement of the downtown Molalla pedestrian environment.
- The provision of appropriate sidewalk and/or multi-use trails both to and from and within all new development in the city, and to the future park in the southern portion of the City.

In addition to providing the pedestrian system components, there are several other potential enhancements that are recommended along the major street network, especially within the downtown area. These amenities help to bring vitality to the sidewalk environment and include:

- street lighting to provide clear visibility of pedestrians at night;
- curb extensions that provide for the existing on-street parallel parking while reducing the exposed crossing distance pedestrians must walk;
- median treatments that provide pedestrians with a “safe-haven” at a mid-crossing.
- benches and other outdoor seating devices to allow people to sit, converse with others, or eat lunch;
- trees and landscaping to buffer pedestrians from the street edge and provide for an attractive streetscape; and
- miscellaneous street furniture including drinking fountains, public kiosks, and trash receptacles.

Bicycle System Components

The bicycle plan is intended to establish a network of bicycle lanes and routes that connect the City’s bicycle generators and provide a safe and effective bicycle travel system. As shown in Figure 22, bicycle lanes should be provided along all arterials and major collectors with the exception of those located within the downtown Molalla area. These designated on-street bicycle lanes provide essential connections between many of the residential neighborhoods, commercial areas, schools, and various recreational areas within the city.

Like the pedestrian system previously discussed, enhancements are recommended throughout the City of Molalla to improve the bicycle network, including:

- six-foot-wide striped bicycle lanes help to define the travel lanes for bicyclists and increase driver awareness,
- signing to help define bicycle routes within the city, and
- requiring bicycle generators, such as schools, parks, and large commercial developments, to provide bicycle parking as part of the development.

As the City of Molalla reviews potential bicycle system improvements, it should recognize that there is usually limited funding for such projects. To help alleviate the potential funding shortages, the city should require bicycle system improvements in conjunction with development-related street improvements.



FIGURE
22

MOLALLA TRANSPORTATION SYSTEM PLAN

Bicycle System Plan

- Bicycle Facilities**
- █ Existing Bike Lanes
 - █ Future Bike Lanes
 - Urban Growth Boundary



PUBLIC TRANSPORTATION PLAN

At the time this TSP was being adopted, the South Clackamas Transportation District (SCTD) had recently completed an update of its Comprehensive Transit Service Plan and was preparing to start up intracity bus service within Molalla. The TSP incorporates by reference SCTD's Comprehensive Transit Service Plan as its public transportation element.

MARINE SYSTEM PLAN

No navigable waterways are located in the City of Molalla.

AIR TRANSPORTATION SYSTEM PLAN

To meet existing and future air transportation needs, the City of Molalla should continue to support the continued use and expansion of local and regional air transportation facilities. These air transportation facilities include the Portland International Airport (PDX), the Mulino Airport, and the Skydive Oregon (formerly Hutchinson) Airport.

The Skydive Oregon Airport is located to the west of the Molalla UGB. Oregon statutes require that whenever a jurisdiction reviews its comprehensive plan, any land surrounding the airport must be zoned with an Airport Overlay District to protect the function of the airport as the city expands westward. Conversations with the airport operators indicated that there is no short or long term plans for expansion. This TSP has determined that the present and future Molalla UGB is located far enough away from the airport that special overlay zoning considerations are not required at this time. If and when an expansion of either the airport or the Molalla UGB may cause a conflict, the City should investigate the need for any zoning overlay considerations at that time.

PIPELINES AND TRANSMISSION SYSTEMS PLAN

Adequate 20-year capacity is provided by the current system. Existing pipeline facilities should be maintained and enhanced as necessary by their respective owners.

IMPLEMENTATION PLAN

This section has outlined specific transportation system improvement projects as well as a corresponding timeline for implementation of the identified improvements. The sequencing plan presented is not detailed to the point of a schedule identifying specific years when infrastructure should be constructed, but rather ranks projects to be developed within near-term (0-5 years) and longer-term (6-10 and 11-20 years) horizon periods. In this manner, the implementation of identified system improvements has been staged to spread investment in the City's transportation infrastructure over the 20-year life of the plan. The City will need to periodically update its TSP and will review the need and timing for longer-term improvements at those times.

The construction of roads, water, sewer, and electrical facilities in conjunction with local development activity should be coordinated if the City of Molalla is to develop in an orderly and efficient way. Consequently, the plans proposed in the TSP should be considered in light of developing infrastructure sequencing plans, and may need to be modified accordingly.

SUMMARY

The planned transportation improvements in the City of Molalla over the next 20 years, to meet both short and long-term needs, are listed in Table 17. As a starting point for this draft TSP, it has been assumed that the majority of City funding for these projects will come from the City's transportation Systems Development Charge (SDC) and that the \$8 million in revenue projected by the current SDC over 20 years will be available in equal amounts each year and that SDCs will be adjusted for inflation. The current SDC methodology assumed for some project types that only 50-75% of a project's cost was due to growth; the same assumptions have been used in developing this funding program. The non-SDC revenue for these projects (shown as "other City" in Table 17) would need to come from the City's general transportation budget or from other sources. Potential funding sources are discussed in the next section.

Table 17 lists projects in order of priority, while recognizing that only a certain amount of money will be available during each period to fund projects. As a result, a number of lower-cost improvements that are needed immediately are shown in the 0-5 year time frame, while more expensive projects, such as the Molalla Forest Road bypass, are shown farther in the future, both because they are not needed immediately and because it will take time to accumulate the funds to build those projects. Following these three lists is a set of safety projects that would be funded by either the County or ODOT. These projects are recommended to be completed within a 10-year time frame; sooner if an accident problem develops. Finally, there is insufficient funding for one project, widening Molalla Avenue, within the funds currently identified.

Following Table 17 is a brief description of each of the projects listed in the table.

**Table 17
Transportation Improvement Program Summary**

Improvement Location	Type of Improvement	Estimated Cost	Funding Sources
Near Term (1-5 Years)			
Highway 211/Highway 213	Intersection Improvements	\$450,000	SDC/Development/ODOT
Toliver Road/Highway 213	Intersection Improvements	\$330,000	SDC/Development/ODOT
Meadow Drive/Highway 213	Intersection Improvements	\$150,000	SDC/Development/ODOT
5 th Street	Roadway Extension	\$470,000	SDC
May Avenue	Street Reconstruction	\$75,000	SDC
Section Avenue	Street Reconstruction	\$100,000	SDC
Heintz Street	Street Reconstruction	\$210,000	SDC
South Cole	Street Reconstruction	\$140,000	SDC
Shirley	Street Reconstruction	\$370,000	SDC
Mathias Road/Freyrer Park Road	Intersection Improvements	\$100,000	SDC/Other city
Main Street/Grange Street	Intersection Safety	\$20,000	SDC/ODOT
Pedestrian and Bicycle Improvements	Sidewalks and Bike Facilities	\$125,000	SDC
Near Term (6-10 years)			
Molalla Avenue/Main Street	Intersection	\$160,000	SDC/ODOT/County
Molalla Avenue/Toliver Road	Intersection	\$150,000	SDC/Other city/County
Pedestrian and Bicycle Improvements	Sidewalks and Bike Facilities	\$125,000	SDC
Toliver Road	Roadway Widening	\$2,000,000	SDC/Other city/County
Long Term (11-20 years)			
Leroy Avenue/Main Street	Intersection Improvement	\$200,000	SDC/Other city
Molalla Avenue/Shirley Street	Intersection Improvement	\$150,000	SDC/Other city
Pedestrian and Bicycle Improvements	Sidewalks and Bike Facilities	\$250,000	SDC
Mathias Road/Main Street	Intersection Improvement	\$400,000	SDC/ODOT/County
Molalla Forest Road/Main Street	Intersection Improvement	\$150,000	SDC
Highway 211	Roadway Widening	\$185,000	SDC/ODOT
Molalla Forest Road	Roadway Upgrade	\$4,300,000	SDC
Mathias Road	Roadway Widening	\$1,300,000	SDC
County/ODOT Projects			
Vick Road/Highway 213	Intersection	\$90,000	County/ODOT
Vaughn Road/Highway 211	Intersection	\$100,000	County/ODOT
Highway 213	Roadway/Safety	\$500,000	ODOT
Sawtell Road/Molalla Avenue/Wilhoit	Intersection	\$100,000	County
Sawtell Road/Eves Road	Intersection	\$100,000	County
No Funding Identified			
Molalla Avenue	Roadway Widening	\$1,875,000	

Highway 211/Highway 213

As development occurs in the vicinity of this intersection, several improvements will be needed over time, including signalization, left-turn lanes on all approaches, and northbound and westbound right-turn lanes. These improvements will be constructed on an as-needed basis, concurrent with the development of nearby parcels. The City should coordinate with Clackamas County and ODOT to make sure that development applications in the vicinity of this intersection include an analysis of the transportation impacts of each proposed development on this intersection, and that developments are conditioned to appropriately mitigate the impacts of their traffic.

Toliver Road/Highway 213

Left-turn lanes are recommended on Highway 213 in the short term. As development occurs in the area, a traffic signal will be needed at this location.

Meadow Drive/Highway 213

A traffic signal will be required in the future at this intersection to accommodate traffic growth. The City should require future applicants for residential development in and adjacent to the Big Meadow subdivision to assess whether the proposed development will trigger the need for a traffic signal at this intersection.

5th Street Extension

An extension of 5th Street between Eckerd Avenue and Cole Avenue will provide a continuous east-west alternative to Main Street in the southeastern portion of Molalla.

Street Reconstruction

Five street reconstruction projects are currently slated to be funded by Molalla's transportation SDC:

- May Avenue, between 5th and 6th Streets;
- Section Street, between Molalla and Hart Avenues;
- Shirley Street, between Molalla and Cole Avenues;
- Heintz Street, between Cole Avenue and Grange Street; and
- Cole Avenue, the dead-end portion south of Main Street.

Mathias Road/Freyrer Park Road

This intersection should be realigned so that Freyrer Park Road intersects Mathias Road as a "T" intersection to the north of 6th Street, as shown in the City's 1989 Transportation Plan. The City should seek County assistance in funding this project involving two County roads.

Main Street/Grange Street/Berkley Avenue

To improve pedestrian safety at these closely-spaced intersections, and to eliminate conflicting turning movements, a raised median with pedestrian refuge is proposed in the center of Main Street to serve the existing crosswalk and to block left turns into and out of Grange Street. The raised median will provide an easier crossing for pedestrians wishing to travel to the grocery store on the north side of Main Street. Prohibiting left turns into and out of Berkley Street will reduce the number of conflict points between through and turning automobiles, and between automobiles and pedestrians. This improvement will

require the removal of on-street parking on Main Street between Swiegle and Lola Avenues. Appropriate signing for the pedestrian crossing should be provided.

Pedestrian and Bicycle Projects

A portion of the SDC revenue (averaging \$25,000 per year) is allocated for pedestrian and bicycle projects throughout Molalla. These projects can include installing sidewalks on major streets, constructing off-street pedestrian and bicycle pathways, striping bicycle lanes, constructing curb extensions at intersections, and so on. Specific projects should be determined as part of the City's annual capital improvement program planning process. In the near term, the City should review the signing provided at mid-block pedestrian crosswalks throughout the City for compliance with the *Manual on Uniform Traffic Control Devices*.

Molalla Avenue/Main Street

A traffic signal will be required at this location in the future. The City should seek ODOT and County participation in this project. Depending on the timing of the development of the Molalla Forest Road as a downtown bypass in relationship to where and when residential growth occurs in the City, left-turn lanes may be needed on some intersection approaches. Constructing left-turn lanes would require the removal of on-street parking in the intersection vicinity; if left-turn lanes are needed, the City should investigate the potential for providing additional off-street parking in the downtown area. Prohibiting left turns from Molalla Avenue will also be a possibility, once alternative routes are in place to get traffic onto Main Street.

Molalla Avenue/Toliver Road

A traffic signal will be needed at this location in the future. The City should seek County participation in this project.

Toliver Road Widening

To provide an attractive east-west alternative to Main Street, and to serve traffic from future residential development in northern Molalla, Toliver Road should be improved to major collector street standards, including a three-lane cross section, bicycle lanes, and sidewalks. The hump in the road where it intersects Molalla Forest Road should also be removed as part of this project. The City should seek County participation in this project.

Leroy Avenue/Main Street

This intersection may need to be signalized in the longer-term future, depending on when adjacent land redevelops, particularly the industrial area south of Main Street.

Molalla Avenue/Shirley Street

Without an extension of Heintz Street, Shirley Street will become the major east-west route in northeastern Molalla. Its intersection with Molalla Avenue will need to be signalized in the future.

Mathias Street/Main Street

This intersection is the eastern gateway to Molalla. The current "Y" intersection should be redesigned into a more conventional form to reduce the number of potential conflict points. Two possibilities exist: a conventional "T" intersection aligned to direct traffic onto the Mathias Street portion of the downtown bypass, or a roundabout that would slow traffic entering the City and could serve as a gateway feature. To

avoid misdirecting drivers wanting to stay on Highway 211, a “T” intersection should be constructed in conjunction with the opening of the downtown bypass. The roundabout could be constructed at any time.

Molalla Forest Road/Main Street

In conjunction with the opening of the downtown bypass, an intersection will be required where the downtown bypass intersects Main Street. Both a “T” intersection or a roundabout are possible options with this alternative, similar to the Main Street/Mathias Road intersection improvement. This intersection will need to be located west of where the Forest Road right-of-way intersects Main Street, to avoid the need to widen the Bear Creek culvert.

Downtown Bypass (existing Highway 211 section)

Highway 211 should be widened between its future intersection with Main Street and Highway 213 to provide a three-lane cross-section, bicycle lanes, and sidewalks. This project is placed in the 11-20 year future to match the remainder of the bypass, but could occur sooner if development occurs adjacent to the highway.

Downtown Bypass (Molalla Forest Road section)

Molalla Forest Road should be reconstructed as needed and widened between Main Street and Mathias Road to provide one travel lane in each direction, a landscaped median, bicycle lanes, and sidewalks. Access should be limited to public street connections and property with no other public street access, in order to preserve its function as a bypass into the future. Unless additional funding sources can be found, the cost of this project relative to the rate at which SDC funds will accrue will mean that it will likely not be constructed until later in the 11-20 year timeframe. However, an earlier completion date will reduce and/or postpone the need for other improvement projects along Main Street.

Downtown Bypass (Mathias Road section)

Mathias Road should be widened to three lanes, with bicycle lanes and sidewalks, between Main Street and Molalla Forest Road. Impacts on adjacent single-family homes will need to be carefully addressed. As with the other sections of the bypass, this project is in the 11-20 year timeframe.

County/State Safety Improvement Projects

The City should work with Clackamas County and ODOT to place the following safety-related projects onto the respective agencies’ transportation improvement programs:

- **Vick Road/Highway 213**—Southbound left-turn lane. This timing of this project will depend on whether a north-south connection is made by development to Vick Road, increasing the amount of traffic using Vick Road.
- **Vaughn Road/Highway 211**—Northbound left-turn lane and sight-distance improvements. This project is the highest priority of these five projects, due to the sight distance issues.
- **Highway 213 widening**—Providing bicycle lanes and removing ditches along Highway 213 within the Molalla urban growth boundary.
- **Sawtell Road/Molalla Avenue/Wilhoit Road**—Realigning this road into a “T” intersection, as shown in the 1989 Molalla TSP.
- **Sawtell Road/Eves Road**—Realigning this road into a “T” intersection.

Molalla Avenue Widening

Molalla Avenue should be widened in the future to a three-lane cross-section between Robbins Street and the north UGB, to accommodate the volume of traffic it will carry and to develop an important bicycle and pedestrian link to downtown. Because right-of-way will likely need to be acquired, this will be an expensive project and no funding is currently identified for it.

Section 6

Transportation Funding Plan

Transportation Funding Plan

INTRODUCTION

The Transportation Planning Rule (OAR 660-12-040) requires that the City of Molalla Transportation System Plan (TSP) include a transportation financing program. These programs are to include:

- a list of planned transportation facilities and major improvement;
- a general estimate of the timing for planned transportation facilities and major improvements;
- determination of rough cost estimates for the transportation facilities and major investments identified in the TSP (intended to provide an estimate of the fiscal requirements to support the land uses in the acknowledged comprehensive plan and allow jurisdictions to assess the adequacy of existing and possible alternative funding mechanisms; and,
- a discussion of existing and potential financing sources to fund the development of each transportation facility and major improvement (which can be described in terms of general guidelines or local policies).

Funding for transportation improvement projects typically comes from three sources: federal, state, and local governments. This section provides an overview of these three funding and financing sources and how they can be used by localities to fund transportation projects.

The timing and financing provisions in the transportation financing program are not considered a land use decision as defined by the TPR and ORS 197.712(2)(e) and, therefore, cannot be the basis of appeal under State law. In addition, the transportation financing program is intended to implement the comprehensive plan policies, which provide for phasing of major improvements to encourage infill and redevelopment of urban lands, prior to facilities that would cause premature development of urbanizable areas or conversion of rural lands to urban uses.

CITY OF MOLALLA FUNDING HISTORY

For the fiscal year 1999-2000, the Street Fund for the City of Molalla provided an annual budget of approximately \$699,736 that was dedicated entirely to the operation and maintenance of the City's transportation facilities. Maintenance and preservation are the major work activities performed on the local street system by the City's Public Works Department. Table 18 shows the various sources of revenue that make up the annual Street Fund budget.

Table 18
Sources of Street Fund – Fiscal Year 1999-2000

Source	1997-1998	1998-1999	1999-2000
Beginning Fund Balance	\$168,988	\$130,000	\$100,000
State Gas Tax	\$200,839	\$216,950	\$234,736
PGE Franchise	\$91,283	\$95,000	\$95,000
Transfer from State Revenue Share	\$17,000	\$17,000	\$17,000
Interest	\$1,067	\$1,000	\$2,500
Miscellaneous	\$783	\$100	\$500
CDBG Grant	-	-	\$250,000
Total	\$479,960	\$460,050	\$699,736

As shown in Table 18, the main historic funding sources come from the State Gas Tax and the PGE Franchise fees. These sources contribute approximately \$310,000 per year to the street fund. Additional funding sources are generated from State Revenue Sharing, interest earned, and other miscellaneous sources. In 1999, a CDBG grant contributed an additional \$250,000 to the street fund. An average of approximately \$130,000 in surplus has historically been rolled over to the following year, negating the need to transfer money from the City's general fund. Based on this analysis, Molalla has historically had enough revenue to complete maintenance and preservation projects throughout the city street network. However, as the TSP has shown, predicted growth trends will require the need for several significant roadway and intersection improvement projects throughout the city. The existing funding sources do not adequately address these needs.

There are several options for the city to consider. The primary goal of this funding plan is to reduce the reliance on special grants and the transfer from the City's General Fund.

OREGON TRANSPORTATION FUNDING HISTORY

Road-Related Funding

The most significant portion of Oregon's highway user taxes and fees come from federal fuel and vehicle taxes, state taxes, and general motor vehicle fees. These categories account for 32 percent, 34 percent, and 25 percent, respectively, of all highway user taxes and fees collected in the State. Through the fiscal year 1996, the matching ratio in Oregon for Interstate Funds was: Federal 92.22 percent and State 7.78 percent.

During the 1980s, Oregon's transportation budget was bolstered by a series of two-cent annual gas tax increases. At the same time, the Federal Government was increasing investment in highways and public transportation. The situation is different today. The last three Oregon Legislatures have failed to increase the gas tax and federal budget cuts are reducing transportation funding available to Oregon. The State Highway Fund is further losing buying power because the gas tax is not indexed to inflation, and increased fuel efficiency of vehicles reduces overall consumption. Nevertheless, fuel taxes are still the largest single source of highway revenues at approximately \$390 million annually. Weight-mile taxes levied on trucks are the second largest source of revenue to the Highway Fund, at approximately \$215 million annually.

Oregon Highway Trust Fund revenues are distributed among state (60.05 percent), county (24.38 percent) and city (15.57 percent) governments to fund their priority road needs. Under the 1997-1999 Department

of Transportation budget adopted by the state legislature, a total of \$2,284 million revenue dollars was identified. Of the total available revenue, approximately \$317 million dollars was allocated to counties and \$185 million to cities.

Oregon law allows local governments to levy local fuel taxes for street related improvements, in order to supplement the state funding. Multnomah and Washington Counties, and some small cities (Tillamook, The Dalles, Woodburn) have used this authorization. Several attempts have been made by other jurisdictions, but have not been supported by the local electorate. As few local governments have implemented this option, non-user road revenues tend to be relied upon to supplement the funds received from state and federal user revenues. Other local funding sources have included property tax levies, local improvement district assessments, bonds, traffic impact fees, road user taxes, general fund transfers, receipts from other local governments, and other miscellaneous sources.

Oregon's current fee for cars and other light vehicles weighing 8,000 pounds or less is \$30 biennially. Oregon law permits local governments (counties) and government entities to impose local option vehicle registration fees. To date, no county has implemented this tax.

Cities in Oregon have relied more on transfers from their general funds to support roadway improvements, than have counties. However, Ballot Measure 5, approved by the voters in 1990, reduced the range of funding and financing options available to both cities and counties. Measure 5 limited the property tax rate for purposes other than for payment of certain general obligation indebtedness to \$15 per \$1,000 of assessed value. The measure further divided the \$15 per \$1,000 property tax authority into two components: \$5 per \$1,000 dedicated to the public schools; the remaining \$10 dedicated to other local government units, including cities, counties, special service districts, and other non-school entities. The tax rate limitation for cities and counties went into effect in July 1991. The school portion of the measure was phased in over a five-year period beginning in July 1991.

In 1996, voters again approved a property tax limitation measure, Ballot Measure 47, which further impacted the ability of cities and counties to pay for needed infrastructure through historic or traditional means. Subsequently, Ballot Measure 50 was approved by Oregon voters in May of 1997 and, through implementing legislation, became law in July 1997. Ballot Measure 50 repealed Measure 47 and made efficiency changes to Measure 5. Measure 50 limits taxes on each property by rolling back the 1997-1998 assessed value of each property to 90 percent of its 1995-1996 value. Measure 50 also limits future growth on taxable value to three percent per year, with exceptions for new construction, remodeling, subdivisions, and rezoning. Permanent tax rates for Oregon's local taxing districts are also established in Measure 50 that replace the former tax base amounts of the district. Measure 50 allows voters to approve new short-term levies outside the permanent rate limit if approved by a double majority.

At the same time that increased growth and increased transportation demands are occurring, cities and counties have lost another traditional source of revenue for infrastructure construction and modernization, namely timber harvest receipts. Under a 1993 negotiated mitigation plan, federal forest receipts to support county roads are decreasing 3 percent per year. In 1996, counties received 74 percent of their 1986-90 average receipts, and by 2003 they will receive 55 percent of the late 1980s average receipts.

Given this funding environment, current funding levels and sources are not adequate to meet the transportation needs of the state, counties, or cities, for the next 20 years. In response to this gap between needs and funding, Governor Kitzhaber organized the Oregon Transportation Initiative to look at statewide transportation needs and to develop a program to address how these needs will be met. Through a public process led by business and civic leaders across the State, findings and recommendations on the state of transportation needs and methods to address those needs was submitted to the Governor in July 1996.

One result of these recommendations was the appointment of a committee to develop a legislative proposal to the 1997 Legislature regarding transportation funding. Part of that proposal included a process for identifying a “base” transportation system, with priority given to maintenance, preservation, and operation of a system of transportation facilities and services that ensures every Oregonian a basic level of mobility within and between communities. Other components included provisions for realizing efficiencies resulting from better intergovernmental cooperation (shared resources and equipment, better communication on project needs and definition), and elimination of legislative barriers to more efficient and cost-effective methods of providing transportation services. The State Legislature was unable to reach consensus on the means of collecting and distributing the funds, and the package failed.

A part of future transportation funding will include identification of relationships and responsibilities relative to delivery of projects and services. In Oregon, the primary state role has been to construct and maintain the state highway system and to assist local government with funding of other modes. The State also has a role in intercity passenger services and airports. Historically, this role has been minor, but could grow significantly, if serious efforts were put into intercity transportation improvements. Local governments provide local transit and airport support, in addition to providing maintenance, preservation, and construction for local roads, streets, and bridges. The Federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) began moving decision-making for federal programs to states and this program and other state policies incorporated in the Oregon Transportation Plan (OTP) encourage reassessment of responsibilities and obligations for funding. The Transportation Equity Act for the 21st Century (TEA21), passed in 1998, has continued the efforts first initiated by ISTEA.

These changing relationships have resulted in two significant issues for State and local governments. First, there is no clear definition of State responsibility. At one time, the State operated on an informal consensus that it should provide one-half the match on federally funded, local, and other projects that served statewide needs. No similar consensus seems to exist today. The State’s responsibility for transit, airports, and other local transportation infrastructure and services is not clear. The question of regional equity is raised in considering high-cost project needs, such as the Bend Parkway or the Portland-area light rail program. Regional equity will probably require consideration of all modes together, because different regions may have different modal needs and financial arrangements.

Given this dynamic transportation funding environment, it is clear that local governments need to reassess traditional methods of funding projects and look creatively at ways to meet public expectations of high quality transportation services.

Transit Funding

Transit service in Oregon has evolved from private development and reliance on user fees for operating revenue, to public ownership with public subsidy for operations. No clear philosophy of the State role in providing transit services is evident and the State is discussing how it should raise revenue in support of transit. The State has used general funds, lottery funds, cigarette tax revenue, and other funds at various times to support transit service. These efforts have largely been targeted towards supplying half the required match to federal capital improvement grants. To date, the State has provided no operating funds for transit, other than for the elderly and disabled program. The State role has been one of granting authority to local governments to raise locally generated operating revenue.

While the state’s role in transit funding is limited, the ODOT Public Transit Section does currently administer three public transit funding sources. These include Non-Urbanized Area Formula Program (Section 5311, formerly Section 18), the Special Transportation Fund (STF), and the Elderly and Persons with Disabilities Program (Section 5310, formerly Section 16(b)(2)).

The Non-Urbanized Area Formula Program is a federally funded initiative that provides capital to operate and acquire vehicles for public transportation systems in cities with populations of less than 50,000 and in rural areas. This assistance program is funded annually through an appropriation from the Federal Transit Administration (FTA) to each state, with funds allocated to eligible providers based on a three-part formula. Fifty percent of the funds are distributed based on population, 25 percent are based on ridership, and 25 percent are based on service hours. There is a 50 percent local match requirement for operating costs and a 20 percent match for capital costs. The program stipulates that service must be marketed as “public transit”: exclusive transportation services such as those limited strictly to senior citizens or employers are not eligible for funding under this program. Additional funding details, application information, and general assistance with this program is available through ODOT’s Public Transit Division.

The Special Transportation Fund is intended to fund transportation for elderly and disabled citizens and is funded through the State cigarette tax. Funding for the purchase of vehicles and equipment for special transportation providers (i.e., servicing the elderly and disabled) is provided through the Elderly and Persons with Disabilities Program.

POTENTIAL TRANSPORTATION FUNDING SOURCES

There are a variety of methods to generate revenue for transportation projects. Funding for transportation improvement projects are derived from three sources: federal, state, and local governments. Appendix B (Table B-1) provides a summary of federal, state, and local highway, bridge, sidewalk, and bicycle funding programs which have typically been used in the past. Although property tax is listed as a possible revenue source, the impacts of Ballot Measure 47 severely limit the opportunities for this funding source.

Appendix B (Table B-2) presents details of the revenue sources for streets, bridges, sidewalk, and bicycle facilities currently used by cities. The information is summarized by type of facility, and indicates the percent of revenue each funding source represents for all cities in Oregon, likely trends for the source, known constitutional or other limitations, and their respective rates.

A similar list of currently used revenue sources for public transportation is also included in Appendix B (Table B-3).

Systems Development Charge

The City of Molalla adopted a transportation systems development charge in 1999 to fund 12 projects identified in the 1989 TSP that have not yet been built, as well as four other street reconstruction projects. Transportation systems development charges (SDCs) are fees assessed on new development that are intended to fund transportation projects required by the growth of the City, but not attributable to a particular development. The use of SDCs can help make sure that the transportation system is improved at about the same rate as growth occurs in the City. Similar SDCs are levied by the City to fund storm drainage system and parks and recreation projects.

The methodology used to develop the SDC calculated a project cost of \$8,056,500 (1999 dollars) that was attributable to growth. For example, for local streets and County and ODOT facilities, 75% of the cost of a capacity improvement or street reconstruction project was attributed to growth. This cost was divided by the total number of new daily vehicular trips expected to be generated within the next 20 years due to population growth to determine a cost per trip of approximately \$303. A single-family home is assessed a transportation SDC of \$2,899; other kinds of development are assessed fees in proportion to their daily trip generation relative to that of a single-family home.

The SDC is not currently adjusted for inflation, which means, for example, that at a 3% annual inflation rate, the SDC will only generate approximately \$6,000,000 in revenue in 1999 dollars over a 20-year period. It is recommended that the City amend its SDC ordinance to allow annual adjustments in the fee for inflation, to make sure that the full buying power planned for the SDC is maintained over time. The *Engineering Record/News* Construction Cost Index for the Seattle area is used by other jurisdictions in the Portland area to adjust their SDCs for inflation.

Most of the funding for projects identified in this TSP will come from SDC funds. It should be noted that the availability of these funds will be dependent on whether (1) as much growth occurs as expected, and (2) when this growth occurs. However, if growth occurs more slowly than projected, some of the projects identified in this TSP will then not be needed.

Section 7

Land Use Ordinance Modifications

Land Use Ordinance Modifications

This section summarizes recommended amendments to the City's codes to implement the Transportation Planning Rule. Specific recommendations for amendments to the Comprehensive Plan and Municipal Code are provided in Appendix C.

The State's Transportation Growth Management Program has developed two model ordinances that can assist the city of establish appropriate regulations: a model zoning ordinance for small communities and an infill and redevelopment ordinance. The model zoning ordinance and accompanying guidebook has been developed specifically for small cities with populations under 10,000. The City is encouraged to refer to the model ordinance and guidebook for strategies and model code provisions that can be readily adapted, adopted, and implemented locally to focus and stimulate urban residential and commercial development.

LOCAL PLAN AND CODE DOCUMENTS

The following documents were reviewed to determine changes needed to comply with the Transportation Planning Rule requirements:

- Molalla Comprehensive Plan
- Title 16, Land Use Developments, Molalla Code
- Title 17, Subdivisions, Molalla Code
- Title 18, Zoning, Molalla Code

OREGON TRANSPORTATION PLANNING RULE REQUIREMENTS

The Oregon Transportation Planning Rule (OAR 660, Division 12) as amended May and September 1995, requires cities with populations of 2,500 or more to adopt Transportation System Plans (TSPs) with land use ordinances to meet 20-year transportation needs.

APPLICABLE LOCAL PLANS AND CODES

Portions of existing comprehensive plans or ordinances, or combination of plans that meet all or some of the requirements of the Transportation Planning Rule, may be incorporated by reference into a local transportation system plan.

ROAD NETWORK AND CONNECTIVITY

TSPs require a road plan for a network of arterials and collectors and standards for the layout of local streets and other important non-collector street connections. The standards for the layout of local streets addresses extensions of existing streets, connections to existing or planned streets including arterials and collectors, and connections to neighborhood destinations.

TSPs also require a bicycle and pedestrian plan for a network of bicycle and pedestrian routes throughout the planning area.

LAND USE REGULATIONS

Appendix C proposes amendments to land use regulations to implement the Transportation Planning Rule. Exceptions to code regulated uses include:

- minor transportation facility improvements with no significant impact on land use;
- operation, maintenance, and repair of existing transportation facilities identified in the transportation system plan;
- dedication of right-of-way, authorization, and the construction of facilities and improvements;
- farm and forest uses permitted outright; and
- changes in the frequency of transit, rail, and airport services.

The Transportation Planning Rule requires adoption of land use or subdivision ordinance regulations, including:

- access control measures for state highway facilities;
- standards to protect the future operation of state highway facilities;
- measures to protect public use airports;
- a process for coordinated review of land use actions with ODOT;
- a process to apply conditions to development approvals;
- regulations to provide notice to public agencies;
- land use applications that require public hearings;
- subdivision and partition applications;
- other applications that affect private access to roads; and
- regulations ensuring that amendments to land use designations and densities are consistent with the functions, capacities, and levels of service of facilities identified in the TSP.

Specific ordinance regulations require:

- bicycle parking facilities as part of new multifamily residential development;
- on-site facilities to accommodate safe and convenient pedestrian and bicycle access from within new subdivisions, multifamily developments, planned developments, shopping centers, and commercial districts to adjacent residential areas;
- sidewalks along arterials and collectors in urban areas, except for freeways; and
- cul-de-sacs and other dead-end streets may be used as part of a development plan, consistent with the purposes of the Transportation Planning Rule.

Local governments must establish their own standards or criteria for providing streets and accessways. Such measures may include standards for spacing of streets or accessways, while avoiding excessive out-of-direction travel. Streets and accessways need not be required where one or more of the following conditions exist:

- physical or topographic conditions make a street or accessway connection impracticable;
- buildings or other existing development on adjacent lands physically preclude a connection;

- where streets or accessways would violate provisions of leases, easements, covenants, restrictions or other agreements; or
- where off-site road improvements are otherwise required as a condition of development approval.

Local governments must establish standards for local streets and accessways that minimize pavement width and total right-of-way. Local street standards adopted to meet this requirement need not be adopted as land use regulations.

The Transportation Planning Rule requires safe and convenient access as bicycle and pedestrian routes, facilities and improvements that are reasonably free from hazards, provide a reasonably direct route of travel, and meet travel needs of cyclists and pedestrians considering destination and length or trip.

SPECIFIC ORDINANCE AMENDMENTS

The following tables listed below, located in Appendix C, describe specific changes to Molalla's Comprehensive Plan and implementing ordinances under the following categories:

- Agency Coordination and Review (Table C-1);
- Access Management (Tables C-2.A, C-2.B, C-2.C);
- Protection of Transportation Facilities (Table C-3);
- Implementation (Table C-4);
- Bicycles and Pedestrians (Table C-5);
- Permitted and Conditional Transportation Improvements (Table C-6); and
- Street Standards (Table C-7).

The recommended ordinance amendments are intended to bring Molalla's Comprehensive Plan and implementing ordinance into compliance with the TPR. The recommended ordinance amendments are provided for local review and refinement. DLCD allows local jurisdictions to adopt TSPs in two steps:

- first, the TSP document along with local street plan; and
- second, local plan, code and street standard amendments.

Section 8

Transportation Planning Rule
Compliance

Transportation Planning Rule Compliance

In April 1991, the Land Conservation and Development Commission (LCDC), with the concurrence of ODOT, adopted the Transportation Planning Rule (TPR), OAR 660 Division 12. The TPR requires local jurisdictions to prepare and adopt a Transportation System Plan (TSP) by 1997. Outlined below is a list of TPR requirements for a TSP for an urban area with a population between 2,500 and 25,000, the corresponding OAR reference, and how each of these requirements were addressed in the City of Molalla TSP. Other related activities that were conducted as part of the TSP process are shown in *italics*.

**Table 19
Development of a Transportation System Plan**

TPR <i>Recommendations</i> and Requirements	
Public and Interagency Involvement	City of Molalla TSP Compliance
<ul style="list-style-type: none"> ▪ <i>Establish Advisory Committees.</i> 	A Management Team and Technical Advisory Committee (TAC) was established at the outset of the or the project. Membership on the Management Team included various representatives from the City. Members on the Technical Advisory Committee included representatives from all facets of the community.
<ul style="list-style-type: none"> ▪ <i>Develop informational material.</i> 	Technical memoranda and current status reports in the form of a newsletter were compiled and made available to the public throughout the process. Furthermore, press releases concerning the project and opportunities for participation at public meetings were distributed in the local newspaper.
<ul style="list-style-type: none"> ▪ <i>Schedule informational meetings, review meetings and public hearings throughout the planning process. Involve the community.</i> 	Three meetings were held throughout the planning process. The meetings were advertised by distribution of meeting notices. Public hearings were held on the draft TSP.
<ul style="list-style-type: none"> ▪ Coordinate TSP with other agencies. (OAR 660-012-0015(5)-(7)) 	Coordination with local government agencies was accomplished by including them on the project mailing list, individual project briefings/meetings, and participation on both the Management Team and TAC.
Review Existing Plans, Policies, and Standards	City of Molalla TSP Compliance
<ul style="list-style-type: none"> ▪ <i>Conduct land use analysis - existing land use/vacant lands inventory.</i> 	Analyses of the existing and vacant lands throughout the City of Molalla were reviewed to help determine potential development patterns and forecast transportation needs.
<ul style="list-style-type: none"> ▪ Review and evaluate existing comprehensive plans. (OAR 660-012-0025(2)) 	The existing City of Molalla Comprehensive Plan (1980), the 1999 Oregon Highway Plan (1999), and the Clackamas County Rural TSP (incomplete) were reviewed as part of the development of the TSP.
<ul style="list-style-type: none"> ▪ <i>Review existing ordinances - zoning, subdivision, engineering standards.</i> 	Existing City zoning, subdivision ordinances, and engineering standards were reviewed for adequacy in the development of the City of Molalla TSP.
<ul style="list-style-type: none"> ▪ <i>Review existing significant transportation studies.</i> 	Significant transportation studies reviewed as part of the City of Molalla TSP include the above mentioned comprehensive plans, their associated transportation elements, and several transportation impact studies relating to private development applications.
<ul style="list-style-type: none"> ▪ <i>Review existing capital improvements programs/public facilities plans.</i> 	City and State plans were reviewed.
<ul style="list-style-type: none"> ▪ <i>Americans with Disabilities Act requirements.</i> 	The ADA requirements were reviewed and acknowledged as part of the City of Molalla TSP

Inventory Existing Transportation System	City of Molalla TSP Compliance
<ul style="list-style-type: none"> ▪ Street system. (OAR 660-012-0020(3)) 	An inventory of the existing street network, traffic volumes, traffic control devices, accident history, and levels of service is provided in Section 2: Existing Conditions.
<ul style="list-style-type: none"> ▪ Bicycle facilities. (OAR 660-012-0020(3)) 	As noted in Section 2: Existing Conditions, there are very few bicycle lanes and paths along the City of Molalla roadway network.
<ul style="list-style-type: none"> ▪ Pedestrian facilities. (OAR 660-012-0020(3)) 	As noted in Section 2: Existing Conditions, there are several pedestrian ways within the City of Molalla.
<ul style="list-style-type: none"> ▪ <i>Public transportation services.</i> (OAR 660-012-0020(3)) 	A summary of all existing public transportation services is presented in Section 2: Existing Conditions.
<ul style="list-style-type: none"> ▪ <i>Intermodal and private services.</i> (OAR 660-012-0020(3)) 	A summary of the existing intermodal and private carrier transportation services is presented in Section 2: Existing Conditions.
<ul style="list-style-type: none"> ▪ Air transportation. (OAR 660-012-0020(3)) 	A summary of the existing air transportation facilities is provided in Section 2: Existing Conditions. No air transportation facilities are located within the Molalla city limits.
<ul style="list-style-type: none"> ▪ Freight rail transportation. (OAR 660-012-0020(3)) 	A summary of the existing freight rail transportation facilities is provided in Section 2: Existing Conditions.
<ul style="list-style-type: none"> ▪ Water transportation. (OAR 660-012-0020(3)) 	As noted in Section 2: Existing Conditions, there are no water transportation services within the City of Molalla.
<ul style="list-style-type: none"> ▪ Pipeline transportation. (OAR 660-012-0020(3)) 	A summary of the pipeline transportation services is provided in Section 2: Existing Conditions.
<ul style="list-style-type: none"> ▪ <i>Environmental constraints.</i> 	There are no known environmental constraints within the City of Molalla.
<ul style="list-style-type: none"> ▪ <i>Existing population and employment.</i> 	As outlined in Section 1: Introduction, the 1998 City of Molalla population estimate was approximately 5,395 persons. This information is included in Section 3: Future Conditions as the basis for the forecasts that were outlined for this TSP.
Determine Transportation Needs	City of Molalla TSP Compliance
<ul style="list-style-type: none"> ▪ Forecast population and employment (OAR 660-012-0030(3)) 	Population forecasts for the City of Molalla were developed in conjunction with the methodology used to develop the city's systems development charges. The procedure is outlined in Section 3: Future Conditions.
<ul style="list-style-type: none"> ▪ Determination of transportation capacity needs. (OAR 660-012-0020(3)) 	Travel demand forecasts were undertaken as part of this project. The methodology for travel forecasting and assumptions used are contained in Section 3: Future Conditions, which presents an analysis of future transportation conditions and identifies capacity needs.
<ul style="list-style-type: none"> ▪ <i>Other roadway needs (safety, bridges, operation, maintenance).</i> 	Non-capacity related transportation needs are identified and recommended for implementation in Section 5: Transportation System Plan.
<ul style="list-style-type: none"> ▪ Freight transportation needs. (OAR 660-012-0030(1)(c)) 	Future freight transportation needs are addressed in Section 3: Future Conditions
<ul style="list-style-type: none"> ▪ <i>Public transportation needs (special transportation needs, general public transit needs).</i> (OAR 660-012-0030(1)(b)) 	Local public transportation needs were addressed by a separate study prepared for the South Clackamas Transportation District. That study's recommendations have been incorporated into this TSP.
<ul style="list-style-type: none"> ▪ Bicycle and pedestrian needs. (OAR 660-012-0020(3)) 	Future bicycle and pedestrian improvements are to be made in conjunction with roadway improvements to provide cyclists and pedestrians with full accessibility to the City of Molalla's street system. Plans for these facilities are identified in Section 5: Transportation System Plan.

Develop and Evaluate Alternatives	City of Molalla TSP Compliance
<ul style="list-style-type: none"> Update community goals and objectives. 	Community goals and objectives were developed with input from the Molalla Planning Commission.
<ul style="list-style-type: none"> Establish evaluation criteria. (OAR 660-012-0035(3)-(5)) 	The project goals and objectives were used to select the projects included in the preferred alternative.
<ul style="list-style-type: none"> Develop and evaluate alternatives (No-Build system, all build alternatives, transportation system management, transit alternative/feasibility, improvements/additions to roadway system, land use alternatives, combination alternatives). (OAR 660-012-0035(1)-(2)) 	Section 4: Alternatives Analysis includes a summary of the land use and transportation alternatives considered and analyzed for the City of Molalla's TSP. Land use, roadway, and bike and pedestrian options were analyzed.
<ul style="list-style-type: none"> Select recommended alternative. 	A recommended alternative for roadways, bikeways, and pedestrian facilities is described in Section 4: Alternatives Analysis and developed in Section 5: Transportation System Plan.
Produce a Transportation System Plan	City of Molalla TSP Compliance
<ul style="list-style-type: none"> Transportation goals, objectives and policies. 	Section 1: Introduction contains the TSP's goals and objectives.
<ul style="list-style-type: none"> Streets plan element (functional street classification and design standards, proposed facility improvements, access management plan, truck plan, safety improvements). (OAR 660-012-0020(2)(b)) 	The streets plan element is outlined in Section 5: Transportation System Plan.
<ul style="list-style-type: none"> Public transportation element (transit route service, transit facilities, special transit services, intercity bus and passenger rail). (OAR 660-012-0020(2)(c)) 	The TSP incorporates by reference the South Clackamas Transit District's Comprehensive Service Plan, which addresses intercity, intracity, and paratransit services.
<ul style="list-style-type: none"> Bikeway system element. (OAR 660-012-0020(2)(d)) 	The bikeway plan is presented in Section 5: Transportation System Plan
<ul style="list-style-type: none"> Pedestrian system element. (OAR 660-012-0020(2)(d)) 	The pedestrian plan is presented in Section 5: Transportation System Plan
<ul style="list-style-type: none"> Airport element (land use compatibility, future improvements, accessibility/ connections/conflicts with other modes). (OAR 660-012-0020(2)(e)) 	The airport element is outlined in Section 5: Transportation System Plan.
<ul style="list-style-type: none"> Freight rail element (terminals, safety). (OAR 660-012-0020(2)(e)) 	Rail issues are addressed in Section 5: Transportation System Plan.
<ul style="list-style-type: none"> Water transportation element (terminals). (OAR 660-012-0020(2)(e)) 	As noted in Section 2: Existing Conditions, there are no existing or future water transportation services within the City of Molalla.
<ul style="list-style-type: none"> Pipeline element (OAR 660-012-0020(2)(e)) 	The pipeline element is outlined in Section 5: Transportation System Plan.
<ul style="list-style-type: none"> Transportation System Management element (TSM). (OAR 660-012-0020(2)(f)) 	TSM element not applicable per OAR 660-12-020(2)(f) and (g).
<ul style="list-style-type: none"> Transportation Demand Management element (TDM). (OAR 660-012-0020(2)(b)) 	TDM element not applicable per OAR 660-12-020(2)(f) and (g).
<ul style="list-style-type: none"> Parking plan. (OAR 660-012-0020(2)(g)) 	This element is not required until the area is part of an MPO
Implementation of TSP	City of Molalla TSP Compliance
Plan Review and Coordination	
<ul style="list-style-type: none"> Consistent with ODOT and other applicable plans. (OAR 660-012-0015(3)(a)) 	Policies and standards contained in applicable plans have been reviewed and incorporated into the TSP.

Adoption	
<ul style="list-style-type: none"> ▪ Is it adopted? (OAR 660-012-0015(4)) 	To follow.
Implementation	
<ul style="list-style-type: none"> ▪ Ordinances (facilities, services and improvements; land use or subdivision regulations). (OAR 660-012-0045) 	Implementing ordinances have been developed under a separate, coordinated, project, and are being adopted at the same time as the TSP.
<ul style="list-style-type: none"> ▪ Transportation financing/capital improvements program. (OAR 660-012-0040) 	The transportation finance plan is summarized in Section 6: Transportation Funding Plan.

Section 9

References

References

1. State of Oregon, Department of Land Conservation and Development. *Transportation Planning Rule, OAR-660-12-005(2, 14, and 15)*.
2. Oregon Department of Transportation Planning. *Transportation System Planning Guidelines*. August 1995.
3. Oregon Department of Transportation. *1997 Oregon Transportation Plan*. April 1997.
4. Oregon Department of Transportation. *1997 Oregon Public Transportation Plan*. 1997.
5. Oregon Department of Transportation. *1991 Oregon Highway Plan*. 1991.
6. Oregon Department of Transportation. *1999 Oregon Highway Plan*. 1999.
7. *Oregon Statewide Transportation Improvement Plan, Draft 2000-2003*.
8. *Clackamas County Rural Transportation Plan, Draft*.
9. City of Molalla. *City of Molalla Comprehensive Plan*. 1980.
10. Lancaster Engineering. *Molalla Center Traffic Impact Study*. 1999.
11. Kittelson & Associates, Inc. *Molalla Retail Center Traffic Impact Study*. 1999.
12. Transportation Research Board. *1994 Highway Capacity Manual, Special Report No. 209*. 1994.
13. Portland State University. Center for Population Research and Census.
14. Aron Faegre & Associates. *Mulino Airport Layout Plan Update Report*. 1993.
15. Institute of Transportation Engineers. *ITE Trip Generation, 6th Edition*. 1997.
16. Oregon Department of Transportation. *State Transportation Fiscal and Statistical Data for 1997*. September 1998.
17. Oregon Department of Transportation. *Financial Services Website*, <http://www.odot.state.or.us/fspublic>. May 1999.
18. Nelson\Nygaard Consulting Associates. *South Clackamas Transit District Comprehensive Transit Service Plan*. October 2000.

Appendix A

Description of Level-of-Service
Methods and Criteria

Appendix A

LEVEL OF SERVICE CONCEPT

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

SIGNALIZED INTERSECTIONS

The six level of service grades are described qualitatively for signalized intersections in Table A1. Additionally, Table A2 identifies the relationship between level of service and average control delay per vehicle. Control delay is defined to include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Using this definition, level of service D is generally considered to represent the minimum acceptable design standard.

Table A1
Level of Service Definitions (Signalized Intersections)

Level of Service	Average Delay per Vehicle
A	Very low average control delay, less than 10 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Average control delay is greater than 10 seconds per vehicle and less than or equal to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for a level of service A, causing higher levels of average delay.
C	Average control delay is greater than 20 seconds per vehicle and less than or equal to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Average control delay is greater than 35 seconds per vehicle and less than or equal to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Average control delay is greater than 55 seconds per vehicle and less than or equal to 80 seconds per vehicle. This is usually considered to be the limit of acceptable delay. These high delay values generally (but not always) indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.
F	Average control delay is in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation. It may also occur at high volume/capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay values.

1 Most of the material in this appendix is adapted from the Transportation Research Board, *Highway Capacity Manual*, Special Report 209 (1997).

Table A2
Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	≤10.0
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

UNSIGNALIZED INTERSECTIONS

Unsignalized intersections include two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections. The *1997 Highway Capacity Manual* provides new models for estimating control delay at both TWSC and AWSC intersections. A qualitative description of the various service levels associated with an unsignalized intersection is presented in Table A3. A quantitative definition of level of service for unsignalized intersections is presented in Table A4. Using this definition, level of service E is generally considered to represent the minimum acceptable design standard.

Table A3
Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Delay per Vehicle to Minor Street
A	<ul style="list-style-type: none"> • Nearly all drivers find freedom of operation. • Very seldom is there more than one vehicle in queue.
B	<ul style="list-style-type: none"> • Some drivers begin to consider the delay an inconvenience. • Occasionally there is more than one vehicle in queue.
C	<ul style="list-style-type: none"> • Many times there is more than one vehicle in queue. • Most drivers feel restricted, but not objectionably so.
D	<ul style="list-style-type: none"> • Often there is more than one vehicle in queue. • Drivers feel quite restricted.
E	<ul style="list-style-type: none"> • Represents a condition in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement. • There is almost always more than one vehicle in queue. • Drivers find the delays approaching intolerable levels.
F	<ul style="list-style-type: none"> • Forced flow. • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection.

**Table A4
Level of Service Criteria for Unsignalized Intersections**

Level of Service	Average Control Delay per Vehicle (Seconds)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

It should be noted that the level of service criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the control delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. **While overall intersection level of service is calculated for AWSC intersections, level of service is only calculated for the minor approaches and the major street left turn movements at TWSC intersections.** No delay is assumed to the major street through movements. For TWSC intersections, the overall intersection level of service remains undefined: level-of-service is only calculated for each minor street lane.

In the performance evaluation of TWSC intersections, it is important to consider other measures of effectiveness (MOEs) in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95th-percentile queue lengths. By focusing on a single MOE for the worst movement only, such as delay for the minor-street left turn, users may make inappropriate traffic control decisions. The potential for making such inappropriate decisions is likely to be particularly pronounced when the HCM level-of-service thresholds are adopted as legal standards, as is the case in many public agencies.

Appendix B

Potential Funding Sources

Potential Funding Sources

**Table B-1
Summary of Road-Related Transportation Funding Programs**

FEDERAL SOURCES	
Program Name	Description
Community Development Block Grants	(CDBG) Community Development Block Grants (CDBG) are administered by the Department of Housing and Urban Development (HUD) and potentially be used for transportation improvements in eligible areas.
STATE SOURCES	
Program Name	Description
OR Transportation Infrastructure Bank	As a pilot program for the USDOT, the Oregon Transportation Commission has made \$10 million available from projects that will not be contracted in FY 1996. The OTIB will make loans for transportation projects and will offer a variety of credit enhancements. Initial loans must be for improvements on federal aid highways, repayments go into an account that will be made available for any mode. Ability to repay will be a key factor in all loans.
Traffic Control Projects	<p>The State maintains a policy of sharing installation, maintenance, and operational costs for traffic signals and luminaire units at intersections between State highway and city streets (or county roads). Intersections involving a State highway and a city street (or county road) which are included on the state-wide priority list are eligible to participate in the cost sharing policy.</p> <p>ODOT establishes a statewide priority list for traffic signal installations on the State Highway System. The priority system is based on warrants outlined in the Manual for Uniform Traffic Control Devices. Local agencies are responsible for coordinating the statewide signal priority list with local road requirements.</p>
Special Public Works Fund (SPWF)	The State of Oregon allocates a portion of revenues from the state lottery for economic development. The Oregon Economic Development Department provides grants and loans through the SPWF program to construct, improve and repair infrastructure to support local economic development and create new jobs. The SPWF provides a maximum grant of \$500,000 for projects that will help create a minimum of 50 jobs.
Transportation Access Charges	<p>The most familiar form of a transportation access charge is a bridge or highway toll. Transportation access charges are most appropriate for high-speed, limited access corridors; service in high-demand corridors; and bypass facilities to avoid congested areas.</p> <p>Congestion pricing, where drivers are charged electronically for the trips they make based on location and time of day, is the most efficient policy for dealing with urban congestion. It not only generates revenue for maintenance and improvements; but also decreases congestion and the need for capital improvements by increasing the cost of trips during peak periods.</p> <p>The Oregon Revised Statutes allow ODOT to construct toll bridges to connect state highways and improve safety and capacity. The Statues also allow private development of toll bridges. Recent actions by the Oregon legislature provide authority for developing toll roads. State authority for congestion pricing does not exist; new legislation would be required.</p>
Immediate Opportunity Fund (IOF)	Financed at a level of \$5 million per year to a maximum of \$40 million through FY96. The fund is to support specific economic developments in Oregon through the construction and improvement of roads and is restricted for use in situations that require a quick response and commitment of funds. It is anticipated that the maximum amount available for a single project is \$500,000 or 10 percent of the annual program level. This fund may be used only when other sources of financial support are unavailable or insufficient and are not a replacement or substitute for other funding sources.
OR Transportation Infrastructure Bank	As a pilot program for the USDOT, the Oregon Transportation Commission has made \$10 million available from projects that will not be contracted in FY 1996. The OTIB will make loans for transportation projects and will offer a variety of credit enhancements. Initial loans must be for improvements on federal aid highways, repayments go into an account that will be made available for any mode. Ability to repay will be a key factor in all loans.

Traffic Control Projects	<p>The State maintains a policy of sharing installation, maintenance, and operational costs for traffic signals and luminaire units at intersections between State highway and city streets (or county roads). Intersections involving a State highway and a city street (or county road) which are included on the state-wide priority list are eligible to participate in the cost sharing policy.</p> <p>ODOT establishes a statewide priority list for traffic signal installations on the State Highway System. The priority system is based on warrants outlined in the Manual for Uniform Traffic Control Devices. Local agencies are responsible for coordinating the statewide signal priority list with local road requirements.</p>
LOCAL SOURCES	
Program Name	Description
Street Utility Fee	<p>Most city residents pay water and sewer utility fees. Street user fees apply the same concept to city streets. A fee would be assessed to all businesses and households in the city for use of streets based on the amount of use typically generated by a particular use. For example, a single-family residence might, on average, generate 10 vehicle trips per day compared to 130 trips per 1,000 square feet of floor area for retail uses. Therefore, the retail use would be assessed a higher fee based on higher use. Street services fees differ from water and sewer fees because usage cannot be easily monitored. Street user fees are typically used to pay for maintenance more than for capital projects.</p>
Vehicle Registration Fees	<p>Counties can implement a local vehicle registration fee. The fee would operate similar to the state vehicle registration fee. A portion of the County fee would be allocated to the City.</p>
Property Taxes	<p>Local property taxes could be used to fund transportation, although this is limited by Ballot Measure 5 and 47.</p>
Revenue Bonds	<p>Revenue Bonds are bonds whose debt service is financed by user charges, such as service charges, tolls, admissions fees, and rents. If revenues from user charges are not sufficient to meet the debt service payments, the issuer generally is not legally obligated to levy taxes to avoid default, unless they are also based by the full faith and credit of the insuring governmental unit. In that case, they are called indirect general obligation bonds. Revenue bonds could be secured by a local gas tax, street utility fee, or other transportation-related stable revenue stream.</p>
Special Assessments/Local Improvements Districts	<p>Special assessments are charges levied on property owners for neighborhood public facilities and services, with each property assessed a portion of total project cost. They are commonly used for such public works projects as street paving, drainage, parking facilities and sewer lines. The justification for such levies is that many of these public works activities provide services to or directly enhance the value of nearby land, thereby providing direct and/or financial benefit to its owners.</p> <p>Local Improvement Districts (LIDs) are legal entities established by the City to levy special assessments designed to fund improvements that have local benefits. Through a local improvement district (LID), streets or other transportation improvements are constructed and a fee is assessed to adjacent property owners.</p>
Systems Development Charges (Impact Fees)	<p>Systems Development Charges (SDCs) are fees paid by land developers intended to reflect the increased capital costs incurred by a municipality or utility as a result of a development. Development charges are calculated to include the costs of impacts on adjacent areas or services, such as increased school enrollment, parks and recreation use, or traffic congestion.</p> <p>Numerous Oregon cities and counties presently use SDCs to fund transportation capacity improvements. SDCs are authorized and limited by ORS 223.297 - 223.314.</p>
Local Gas Tax	<p>A local gas tax is assessed at the pump and added to existing state and federal taxes. Tillamook, The Dalles and Woodburn are Oregon cities that have a local gas tax. Multnomah and Washington Counties also have gas taxes.</p>
Local Parking Fees	<p>Parking fees are a common means of generating revenue for public parking maintenance and development. Most cities have some public parking and many charge nominal fees for use of public parking. Cities also generate revenues from parking citations. These fees are generally used for parking-related maintenance and improvements.</p>

**Table B-2
Currently Used Revenue Sources for Cities (Millions of 1995 Dollars)**

Facility	Revenue Source	Importance	3-year Trend	Dedication	Rate
Streets/Bridges/Sidewalks/Bike Lanes	Oregon Highway Trust Fund	51% of total road or \$89.	Growing about 1.75% per year.	Constitutionally limited to funding activities that benefit autos & trucks.	24¢/gal. for gas; \$30/biennium registration fee.
	General Fund Transfers	9% or \$15.	Varies but assume growth @ 3%/yr. But not used by all cities.	May be used for any purpose.	Varies widely.
	Special Property Tax Levies	5% or \$7.	Increasing, only used by about 18 cities.	May be used for purpose described in election.	Varies widely.
	Improvement District Assessments	7% or \$12.5.	Varies but increases when local development increases.	May be used for construction of adjacent streets-sidewalks.	Varies with construction cost & local ordinances.
	Systems Development Charges/Traffic Impact Fees	4% or \$7.	Varies but increases when local development increases, only used by about 2 dozen cities.	May be used for construction of new streets.	Varies with construction cost & local ordinances. Rates generally higher in Portland Metro area.
	Utility Franchise Fees	3% or \$4.	Grows roughly w/population and inflation.	Is a general revenue used by some cities for streets.	Statutory limit of 5% of utility gross receipts.
	Interest Earnings	4% or \$6.	Varies w/current interest rates.	Have same Constitutional limits as Highway Fund.	Used as general street revenue.
	Local Gas Tax	0.44% or \$0.7	Unchanged.	Have same Constitutional limits as Highway Fund.	Used by Tillamook, The Dalles, and Woodburn.
	Private Contributions	3% or \$4.3	Varies widely.	Usually contributions are related to specific development street impacts.	Negotiated individually.
	Misc. - permit fees, finds, fines, parking, Motel Tax, other	8% or \$14.5.	Gradual growth.	General revenues used for streets.	Varies widely by City.
	Federal - FHWA+HUD	3% or \$5.6.	Relatively stable	Used mainly for new construction w/some rehab.	Based on federal allocation to Oregon.
	Misc. State Revenues - mainly Lottery funds.	2% or \$3.	Varies, no trend.	Used mainly for economic development capital improvements.	Specific grants to individual cities each year.

Off-street Bike Paths	Misc. general funds & ISTEA	??	Varies from year to year.	ISTEA & General Funds used for construction, General Funds used for maintenance & repair.	Varies from year to year.
-----------------------	-----------------------------	----	---------------------------	---	---------------------------

**Table B-3
Currently Used Public Transportation Revenue Sources in Oregon**

Transit Service Type/Function	Funding Sources	Status
Urban Public Transportation (Portland & Eugene) (operating & capital)	<ol style="list-style-type: none"> 1. Local Payroll Tax - operating 2. Federal grants - capital 3. Federal grants - operating 4. Fares & advertising 	<ol style="list-style-type: none"> 1. Major Source - \$100 million/yr. Growing - Sensitive to Economic Conditions 2. Major source - \$10 million/yr - Stable 3. Minor source - \$5 million/yr - Declining 4. Minor source - Growing w/ridership
Urban Public Transportation (Salem, Corvallis, Medford, K-Falls)	<ol style="list-style-type: none"> 1. Property tax (typically a taxbase or stand-alone levy w/in \$10 cap for local gov't services) 2. Federal grants - capital 3. Federal grant - operating 4. Fares & advertising 	<ol style="list-style-type: none"> 1. Major Source - Growing Slowly 2. Major Source - \$2 million/yr. - Stable 3. Major Source - \$2 million/yr. - Declining 4. Minor Source - Growing w/ridership
Small City & Rural (Astoria, Union County, etc.) (operating & capital)	<ol style="list-style-type: none"> 1. Federal grants - capital & operating 2. Local Property Tax (typically w/in city or county operating levy) 3. Fares, donations & advertising 	<ol style="list-style-type: none"> 1. Major Source - Declining 2. Major Source - Stable 3. Minor Source - Stable
Mobility for Seniors & People with Disabilities - (operating & capital)	<ol style="list-style-type: none"> 1. Special Transportation Fund (2¢ state cigarette tax) - operating & capital 2. Social Service Agency grants / contracts - operating 3. Local Property Tax (typically w/in city or county operating levy) 4. Federal grants - capital & operating 5. Fares, donations advertising 	<ol style="list-style-type: none"> 1. Major Source - \$5 million/yr. - Declining 2. Major Source - Declining 3. Minor Source - Stable 4. Major Source - Declining 5. Minor - Stable
Intercity Bus (operating & capital)	<ol style="list-style-type: none"> 1. Major Interstate Routes: Fares 2. Branch & feeder routes: Private capital, Fares 	<ol style="list-style-type: none"> 1. Sole Source - Declining 2. Private

Appendix C

Recommended Code Changes

**Table C-1
City of Molalla TPR Code Compliance
Coordination and Review**

TPR Requirements	Current Code Compliance Yes/No	Current Molalla Plan/Code Provision(s)	Recommended Code Language	Additional Code Consideration(s)
<p>OAR 660-12-045(2) Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions, to include the following topics:</p> <p>660-12-045(2)(d) coordinated review of land use decisions potentially affecting transportation facilities.</p> <p>660-12-045(2)(f) regulations to provide notice to public agencies providing transportation facilities and services of land use applications that potentially affect transportation facilities.</p>	<p>NO</p>	<p>The Comprehensive Plan Policies 6 and 7, require coordination with ODOT and Clackamas County with respect to improvements to Highway 211 and needs which may affect Molalla Avenue.</p> <p>The Land Use Procedures sections do require notice to affected governmental agencies and service districts for all land use actions. However, it does not specifically require notice to ODOT or Clackamas County for variances, conditional use permits, land division or zone change applications that might affect transportation facilities.</p>	<p>Comprehensive Plan Add a Policy 17, Community Facilities, Transportation, as follows: "The city will cooperate and notify all appropriate local, state, and federal agencies and transportation interest groups when a land use application is submitted and potentially impacts a transportation facility. Notification will help to identify agency standards, and provide an efficient and economical transportation system." Land Use Procedures (Title 16) Add a Section to 16.04.250 as follows: " Type A notice for applications affecting transportation facilities: Upon receipt of an application that requires Type A notice, the City Recorder shall notify the ODOT District Manager and other transportation interest groups if the proposal may impact a transportation facility or service." Add a Section to 16.04.260 as follows: "Type B notice for applications affecting transportation facilities: Upon receipt of an application that requires Type B notice, the City Recorder shall notify the ODOT District Manager and other transportation interest groups if the proposal may impact a transportation facility or service." Add Section to 16.04.270 as follows: "Type C notice for applications affecting transportation facilities: Upon receipt of an application that requires Type C notice, the City Recorder shall notify the ODOT District Manager and other transportation interest groups if the proposal may impact a transportation facility or service." Add Section to 16.04.270 as follows: "Notice to the Oregon Departments of Land Conservation and Development (DLCD) and the Department of Transportation (ODOT). A proposal to amend the Comprehensive Plan or Zoning Code to change or adopt a new land use regulation shall be submitted to the Director of the DLCD and the ODOT District Manager at least 45 days before the final City council hearing on adoption." Add Section to 16.04.280 as follows: " Type D notice for applications affecting transportation facilities: Upon receipt of an application that requires Type D notice, the City Recorder shall notify the ODOT District Manager and other transportation interest groups if the proposal may impact a transportation facility or service." Add Section to 16.04.280 as follows: "Notice to the Oregon Departments of Land Conservation and Development (DLCD) and the Department of Transportation (ODOT). A proposal to amend the Comprehensive Plan or Zoning Code to change or adopt a new land use regulation shall be submitted to the Director of the DLCD and the ODOT District Manager at least 45 days before the final City council hearing on adoption." Add Section to 16.04.290 as follows: "Notice of Type E applications affecting transportation facilities: Upon receipt of an application that requires Type E notice, the City Recorder shall notify the ODOT District Manager and other transportation interest groups if the proposal may impact a transportation facility or service." Add Section to 16.04.290 as follows: "Notice to the Oregon Departments of Land Conservation and Development (DLCD) and the Department of Transportation (ODOT). A proposal to amend the Comprehensive Plan or Zoning Code to change or adopt a new land use regulation shall be submitted to the Director of the DLCD and the ODOT District Manager at least 45 days before the final City council hearing on adoption."</p>	

Table C-2.A
City of Molalla TPR Code Compliance
Access Management

TPR Requirements	Current Code Compliance Yes/No	Current Molalla Plan/Code Provision(s)	Recommended Code Language	Additional Code Consideration(s)
<p>660-12-045(2) Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions, to include the following topics:</p> <p>660-12-045(2)(a) access management and control</p>	<p>NO</p>	<p>The Comprehensive Plan contains several Goal 12 policies that promote care of road or street rights-of-way, but does not contain policies that specify access management as a City transportation goal.</p> <p>The Zoning Ordinance (Title 18) does not contain any language that ensures access management.</p> <p>The Subdivision Ordinance (Title 17) does have language that serves to protect the existing transportation system and encourages connectivity. However, the ordinance does not specify access management standards.</p>	<p>Comprehensive Plan Add a Goal to Community Facilities, Transportation, Policy 18 under the heading "Access Management:"</p> <ul style="list-style-type: none"> • "The function of existing and planned roadways as identified in the adopted Transportation System Plan shall be protected through the application of appropriate access control measures. • The function of existing or planned roadways or roadway corridors shall be protected through the application of appropriate land use regulations; for example, residential uses shall not have direct access off a proposed arterial. • The potential to establish or maintain access ways, paths, or trails shall be considered prior to the vacation of any public easement or right-of-way. • Right-of-way for planned transportation facilities shall be preserved through all practical means. This will include exactions, voluntary dedication, setbacks, or other appropriate means." <p>Zoning Ordinance (Title 18) Add to Chapter 18.45 "Development Review" a new Section 18.45.070 "ODOT Notice:" "For all proposed development or redevelopment of properties accessing a state highway, the developer/owner shall notify and coordinate with the ODOT District Manager to ensure proper access management, consistent with the access management provisions of the Transportation System Plan and the Oregon Highway Plan."</p> <p>Land Use Developments (Title 16) Revise 16.08.060(C) to read: "Access Management. Land development will preserve the flow of traffic in terms of safety, capacity, functional classification, and level of service. Access management policies of the City of Molalla set forth in the Transportation System Plan and the State Highway Access Management policies will be observed."</p> <p>Subdivision Ordinance (Chapter 17) Add Chapter 17.09 "General Requirements": "Transportation System Plan. Land divisions shall conform to the access management provisions of this chapter, and shall be designed to manage access to land development while preserving the flow of traffic in terms of safety, capacity, functional classification, and level of service."</p>	

**Table C-2.B (continued)
City of Molalla TPR Code Compliance
Access Management**

TPR Requirements	Current Code Compliance Yes/No	Current Molalla Plan/Code Provision(s)	Recommended Code Language	Additional Code Consideration(s)
			<p>Add to Section 17.20.220 "Lots-- Access" subsection (A): "If direct access to a state highway is proposed, access must be provided in a manner consistent with the access management provisions of the Transportation System Plan and existing ODOT standards.</p> <p>1a. Each proposed lot must be buildable in conformance with the requirements of this Code and all other applicable regulations.</p> <p>2b. Each lot shall abut a public or private street for the required minimum lot frontage for the zoning district where the lots are located.¹</p> <p>3c. If any lot abuts a street right-of-way that does not conform to the design specifications of this Code, the owner may be required to dedicate one-half the right-of-way width necessary to meet minimum design requirements."</p> <p>Also add the following subsections to Section 17.20.220: "(A) Joint and Cross Access</p> <p>(1) Adjacent commercial or office properties classified as major traffic generators (i.e., shopping plazas, office parks), shall provide a cross access drive and pedestrian access to allow circulation between sites.</p> <p>(2) Shared parking areas shall be permitted a reduction in required parking spaces if peak demands do not occur at the same time periods."</p> <p>"(B) Access Connection and Driveway Design</p> <p>(1) Driveway width shall meet the following guidelines:</p> <p>a. If the driveway is a one way in or one way out drive, then the driveway shall be a minimum width of 10 feet and shall have appropriate signage designating the driveway as a one way connection.</p> <p>b. For two-way access, each lane shall have a minimum width of 10 feet and a maximum of four lanes shall be allowed. Whenever more than two lanes are proposed, a median should be considered to divide the entrance and exit lanes. If used, a median should be a minimum of eight feet wide.</p> <p>(2) Driveway approaches must be designed and located to provide an exiting vehicle with an unobstructed view. Construction of driveways along acceleration or deceleration lanes and tapers shall be avoided due to the potential for vehicular weaving conflicts.</p> <p>(3) The length of driveways shall be designed in accordance with the anticipated storage length for entering and exiting vehicles to prevent vehicles from backing into the flow of traffic on the public street or causing unsafe conflicts with on-site circulation."</p>	

**Table C-2.C (continued)
City of Molalla TPR Code Compliance
Access Management**

TPR Requirements	Current Code Compliance Yes/No	Current Molalla Plan/Code Provision(s)	Recommended Code Language	Additional Code Consideration(s)
			<p>“(D) Nonconforming Access Features</p> <p>(1) Permitted access connections in place as of (date of adoption) that do not conform with the standards of the Transportation System Plan shall be designated as nonconforming features and shall be brought into compliance with applicable standards under the following conditions:</p> <ul style="list-style-type: none"> a. When new access connection permits are requested; b. Substantial enlargements or improvements; c. Significant change in trip generation; or d. As roadway improvements allow.” <p>“(E) Shared Access</p> <p>(1) Subdivisions with frontage on the state highway system shall be designed into shared access points to and from the highway. Normally a maximum of one access per minimum spacing distance shall be allowed regardless of the number of lots or businesses served. If access off of a secondary street is possible, then access should not be allowed onto the state highway. If access off of a secondary street becomes available, then conversion to that access is encouraged, along with closing the state highway access.”</p> <p>(2) New direct access to individual one and two family dwellings shall be prohibited on all but District-level State Highways.”</p> <p>“(F) Connectivity</p> <p>(1) The street system of a proposed subdivision shall be designed to coordinate with existing, proposed, and planned streets outside of the subdivision as provided in this Section.</p> <p>(2) Wherever a proposed development abuts unplatted land or a future development phase of the same development, street stubs shall be provided to provide access to abutting properties or to logically extend the street system into the surrounding area. All street stubs shall be provided with a temporary turn-around unless specifically exempted by the Public Works Director, and the restoration and extension of the street shall be the responsibility of any future developer of the abutting land.</p> <p>(3) Minor collector and local residential access streets shall connect with surrounding streets to permit the convenient movement of traffic between residential neighborhoods or facilitate emergency access and evacuation. Connections shall be designed to avoid or minimize through traffic on local streets. Appropriate design and traffic control such as four-way stops and traffic calming measures are the preferred means of discouraging through traffic.”</p>	

**Table C-3
City of Molalla
TPR Code Compliance
Protection of Transportation Facilities**

TPR Requirements	Current Code Compliance Yes/No	Current Molalla Plan/Code Provision(s)	Recommended Code Language	Additional Code Consideration(s)
<p>660-12-045(2) Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions, to include the following topics:</p> <p>660-12-045(2)(e) conditions to minimize development impacts on transportation facilities.</p> <p>660-12-045(2)(g) regulations assuring that amendments to land use designations, densities, and design standards are consistent with the TSP.</p>	<p>NO</p>	<p>The Comprehensive Plan does contain some language to minimize vehicular impacts in the city of Molalla, however, it does not contain specific policy language to minimize development impacts on the transportation system.</p> <p>The Zoning Ordinance does not contain language that requires an amendment to the Land Use Plan or Zoning Ordinance to be reviewed in terms of the potential for impact on the transportation system.</p> <p>The Subdivision Ordinance contains provisions that require a land use application to be submitted for technical review by the City Manager, to determine compliance with existing ordinances and regulations. However, the Ordinance does not set forth specific review criteria for transportation projects.</p>	<p>Comprehensive Plan Add a Policy 19, Community Facilities, Transportation Section, as follows: “Land use proposals shall be reviewed with criteria to minimize impacts on transportation facilities.”</p> <p>Add to Chapter 5, Plan Review and Revision, Major Plan and Implementing Ordinance Amendments: (C) “All Land Use Plan amendments, shall conform with the adopted Transportation System Plan. Proposed amendments shall not substantially impact the functional classification or operation of transportation facilities. To ensure proper review and mitigation, a traffic impact study may be required for proposals that may impact transportation facilities.”</p> <p>Add to Chapter 5, Plan Review and Revision, Minor Plan and Implementing Ordinance Amendments: (D) “All Land Use Plan amendments, shall conform with the adopted Transportation System Plan. Proposed amendments shall not substantially impact the functional classification or operation of transportation facilities. To ensure proper review and mitigation, a traffic impact study may be required for proposals that may impact transportation facilities.”</p> <p>Zoning Ordinance (Title 18) Add to Section 18.92.010 as follows: “All Zone Changes shall conform with the adopted Transportation System Plan. Proposed amendments shall not substantially impact the functional classification or operation of transportation facilities. To ensure proper review and mitigation, a traffic impact study may be required for proposals that may impact transportation facilities.”</p> <p>Subdivision Ordinance (Chapter 17.12) Add Section B to 17.12.010 “Submission” as follows: “(B) “Traffic Impact Study:” “The applicant shall submit a traffic impact study when the proposal affects a transportation facility; if it: 1) changes the functional classification of an existing or planned transportation facility; 2) changes standards implementing a functional classification system; 3) allows types of levels of land use that would result in levels of travel or access that are inconsistent with the functional classification or a transportation facility; or 4) would reduce the level of service of the facility below the minimum acceptable level identified in the Transportation System Plan.”</p> <p>Add Section C to 17.20.020 “Streets - Generally” as follows: “(C) “Conform with the standards set forth in the Transportation System Plan.” “The applicant shall submit a traffic impact study when the proposal affects a transportation facility; if it: 1) changes the functional classification of an existing or planned transportation facility; 2) changes standards implementing a functional classification system; 3) allows types or levels of land use that would result in levels of travel or access that are inconsistent with the functional classification or a transportation facility; or 4) would reduce the level of service of the facility below the minimum acceptable level identified in the Transportation System Plan.”</p>	

**Table C-4
City of Molalla TPR Code Compliance
Implementation**

TPR Requirements	Current Code Compliance Yes/No	Current Molalla Plan/Code Provision(s)	Recommended Code Language	Additional Code Consideration(s)
<p>OAR 660-12-045(1) Amend land use regulations to implement the TSP</p>	<p>NO</p>	<p>The Comprehensive Plan contains policies to guide development of the transportation system, but does not contemplate implementation of the 1991 Transportation Planning Rule which requires local Transportation System Plans and changes to land use regulations.</p>	<p>Comprehensive Plan Add a Policy 20, Community Facilities, Transportation: “Planning decisions shall conform with the Comprehensive Plan , Zoning Maps, and the Molalla Transportation System Plan (TSP). The Future Roadway Network Plan as identified by the Transportation System Plan shall be the conceptual framework for future streets. Final street alignments will be refined through the development review process.”</p> <p>Zoning Ordinance (Title 18) Add a Section in the Zoning Ordinance, “Supplemental Provisions” “Transportation Improvements:”</p> <p>“1. Changes in the specific alignment of proposed public road and highway projects shall be permitted without plan amendment if the new alignment falls within a transportation corridor identified in the Transportation System Plan.</p> <p>2. Transportation projects involving the operation, maintenance, repair, and preservation of existing facilities that are consistent with the classification of that roadway, the approved road standards and the Transportation System Plan shall be allowed, except where specifically regulated (i.e., within a floodplain).</p> <p>3. Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, where the improvements are consistent with the Transportation System Plan, the classification of the roadway and approved road standards shall be allowed.</p> <p>4. For State projects that require an Environmental Impact Study (EIS) or Environmental Assessment (EA), the draft EIS or EA shall serve as the documentation for local land use review, if local review is required.</p> <p>(a) Where the project is consistent with the Transportation System Plan, formal review of the draft EIS or EA and concurrent or subsequent compliance with applicable development standards or conditions;</p> <p>(b) Where the project is consistent with the Transportation System Plan, formal review of the draft EIS or EA and concurrent completion of necessary goal exceptions or plan amendments.”</p>	

**Table C-5
City of Molalla
TPR Code Compliance
Bicycles and Pedestrians**

TPR Requirements	Current Code Compliance Yes/No	Current Molalla Plan/Code Provision(s)	Recommended Code Language	Additional Code Consideration(s)
<p>660-12-045(3) Adopt land use or subdivision regulations for urban areas and rural communities to provide safe and convenient pedestrian and bicycle circulation and bicycle parking, and to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel.</p>	<p>NO</p>	<p>Comprehensive Plan Policies 8 and 9 indirectly encourages bicycle and pedestrian system improvements.</p> <p>The Zoning Ordinance does not contain language that specifically requires new development to provide bicycle and pedestrian system improvements.</p> <p>The Subdivision Ordinance contains suggestive language that allows the Commission to require provision of curb-tight sidewalks, but no specific standards or guidelines to direct separated pedways or bicycle system improvements.</p>	<p>Comprehensive Plan Add a Policy 21, Community Facilities, Transportation: "It is the policy of the city to develop a network of streets, accessways, and other improvements, including bikeways, sidewalks, and safe street crossings to promote safe and convenient bicycle and pedestrian circulation within the community."</p> <p>Zoning Ordinance (Chapter 18.08) Add a Definition to Section 18.08 to read: "Traffic Circulation. A general term denoting provisions to accommodate or encourage all modes of travel and movement which include but are not limited to: motor vehicle, pedestrian, and bicycle."</p> <p>Add a section to the Zoning Ordinance or Land Use Developments Chapter: "All new development shall provide bicycle and pedestrian improvements in accordance with the Comprehensive Plan,"</p> <p>Subdivision Ordinance (Chapter 17.24) Add to Section 17.24.040 "Sidewalks,": "Curbs and sidewalk improvements will be designed and located as established in the Transportation System Plan."</p> <p>Add a Section 17.12.050 (G) to require as part of a Preliminary Plan application: "A plan for bicycle and pedestrian facilities and improvements within the subdivision, including accessways as necessary to provide more direct connections through the subdivision. The tentative plan shall demonstrate how the subdivision's internal pedestrian and bikeway system provides safe and convenient connections to the surrounding transportation system."</p>	

Table C-6
City of Molalla
TPR Code Compliance
Permitted and Conditional Transportation Improvements

TPR Requirements	Current Code Compliance Yes/No	Current Molalla Plan/Code Provision(s)	Recommended Code Language	Additional Code Consideration(s)
<p>660-12-045(1)(a) Identify which transportation facilities, services, and improvements are allowed outright, conditionally permitted, and permitted through other procedures</p>	<p>NO</p>	<p>The Zoning Ordinance does not indicate what types of site/zone specific transportation improvements or standards are allowed outright, or are conditionally allowed to conform with and implement the TSP.</p>	<p>Comprehensive Plan Add a Policy 22, Community Facilities, Transportation: “A list of transportation system improvements which are allowed, conditionally allowed, and permitted through other procedures will be listed in the Zoning Ordinance to implement the TSP.”</p> <p>Zoning Ordinance Add a new Section in the Zoning Ordinance, “Supplemental Provisions” as follows: “ Standards for Transportation Projects</p> <p>11.11.080 Uses Permitted Outright</p> <p>A. Normal operation, maintenance, repair, and preservation activities associated with transportation facilities. B. Installation of culverts, pathways, fencing, guardrails, lighting, and similar types of improvements that take place within the existing right-of-way. C. Projects specifically identified in the TSP as not requiring further land use regulation. D. Landscaping as part of a transportation facility. E. Emergency measures as necessary for the safety and protection of property. F. Acquisition of right-of-way for public roads, highways, and other transportation projects identified in the Transportation System Plan are permitted outright, except for those that are located in exclusive farm use of forest zones.”</p> <p>“11.11.085 Conditional Uses Permitted</p> <p>A. Construction, reconstruction, or widening of highways, roads, bridges, or other transportation projects that are: (1) not specifically identified in the Transportation System Plan or (2) not designed and constructed as part of a subdivision or planned development subject to site plan and/or conditional use review. These transportation projects shall comply with the TSP and applicable standards, and shall address the following criteria. For State projects that require an EIS or EA, the draft EIS or EA shall be reviewed and used as the basis for findings to comply with the following criteria:</p> <ol style="list-style-type: none"> 1. The project is designed to be compatible with existing land use and social patterns, including noise generation, safety, and zoning. 2. The project is designed to minimize avoidable environmental impacts, to identified wetlands, wildlife habitat, air and water quality, and cultural resources. 3. The project preserves or improves the safety and function of the facility through access management, traffic calming, or other design features. 4. Project includes provision for bicycle and pedestrian circulation as consistent with the comprehensive plan and other requirements of this ordinance. <p>B. Construction of rest areas, weigh stations, and temporary storage and processing sites.</p> <p>C. If review under this Section indicates that the use or activity is inconsistent with the TSP, the procedure for a plan amendment, including any necessary goal exceptions, shall be undertaken prior to or in conjunction with the conditional permit review.”</p>	

**Table C-7
City of Molalla
TPR Code Compliance
Street Standards**

TPR Requirements	Current Code Compliance Yes/No	Current Molalla Plan/Code Provision(s)	Recommended Code Language	Additional Code Consideration(s)
<p>OAR 660-12-045(7) Establish street standards that minimize pavement width and total right-of-way.</p>	<p>NO</p>	<p>The Subdivision Ordinance contains street standards, language, and guidelines that require generous pavement and right-of-way widths.</p>	<p>Comprehensive Plan Add a Policy 23, Community Facilities, Transportation: “All transportation facilities will conform with the Transportation System Plan Street standards.”</p> <p>Land Use Development Ordinance (Title 16) Add a Section 16.08.060(D): “All transportation facilities will conform with the Transportation System Plan city street standards.”</p> <p>Subdivision Ordinance (Chapter 17.20) Amend standards of 17.20.030 “Design Standards” to minimize pavement and right-of-way width (for example, 24- to 32-foot pavement widths for cul-de-sacs and streets). “Cul-de-sacs shall only be approved where street connections are otherwise not possible due to topography or natural area constraints.” Add a Section 17.20.140: “Marginal Access streets may be permitted for 2 to 5 dwellings, only where local street connectivity is not practical due to topographic constraints or existing development patterns preclude a through route extension.”</p>	

Communities are encouraged to consider reducing lot widths and front yard setbacks to create a more pedestrian friendly street environment. These steps expand development options and can help to slow traffic on residential streets.
