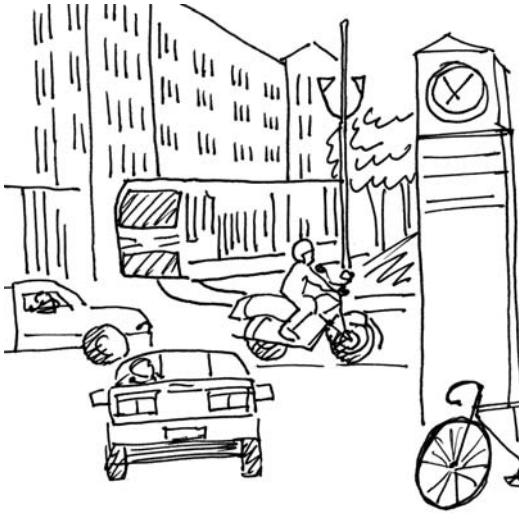
MODAL PLANS and MANAGEMENT PLANS

5

INTRODUCTION

When Portland's first Comprehensive Plan was written in 1980, the job of transportation planners and engineers was to accommodate existing travel demand and the vehicle traffic it generated as best as possible with the available resources. Today, the community can no longer afford this response to transportation needs.



In 1980, the Portland urbanized area (urbanized portions of Clackamas, Multnomah, and Washington counties in Oregon) had a population of 970,000 people. The average person generated about 12 miles of vehicular travel per day.

By 1997, population had increased by over 25 percent to 1,217,000 people. The average vehicular miles each person traveled per day had increased by 75 percent, and total vehicle miles traveled (VMT) had increased by 108 percent.

As a result of this fast-growing demand for mobility, too many vehicles are competing for too little space within the public right-of-way. The consequences include greater traffic congestion, longer travel times between destinations, huge traffic jams caused by minor incidents, more road rage as people are delayed, and threats to air quality, even as the exhaust from each individual car has become much cleaner.

The competition for vehicle space also has consequences for residential neighborhoods. To avoid the congested arterials, increasing numbers of cars travel at excessive speeds on local neighborhood streets. Neighborhood safety and livability are reduced, and residents become frustrated and angry about the traffic in front of their homes. Increasing traffic volumes also have consequences for economic health as truck delays increase the costs of doing business.

Portland's Transportation System Plan (TSP) will help the City take a more proactive approach to transportation planning. It sets transportation priorities and recommends a variety of programs and strategies to serve expected travel demand. The TSP recognizes that the transportation system must address the needs of all users of the right-of-way and accommodate those needs in the most efficient way.

This chapter reflects this comprehensive approach to transportation planning. It provides plans for multiple modes of travel: motor vehicle; public transportation and transportation disadvantaged; pedestrian; bicycle; freight; and air, rail, water, and pipeline. It also includes

a plan that addresses transportation demand management (TDM) and parking, and a plan for transportation system management (TSM).

REQUIREMENTS FOR MODAL PLANS

Transportation Planning Rule

Oregon's Transportation Planning Rule (TPR), adopted in 1991, reflects the state's desire to build a balanced, multimodal, accessible transportation system that reduces reliance on the automobile. In accordance with this vision, it requires metropolitan areas and cities to reduce vehicle miles traveled per capita and the number of parking spaces per capita. It also requires all TSPs to include:

- A modal plan for each transportation mode
- Measurable goals for increasing the modal share of modes other than the single occupant vehicles
- Interim benchmarks for evaluating progress towards these goals

The TPR also identifies the following minimum elements that must be included in each modal plan:

- An inventory and general assessment of existing and committed transportation facilities and services by function, type, capacity, and condition. The capacity analysis shall include:
  - Capacities of existing and committed facilities
  - Degree to which the capacities have been reached or surpassed on existing facilities
  - Assumptions on which these capacities are based
  - For state and regional facilities, consistency with standards of facility performance considered acceptable by the affected state or regional agency

  Conditions shall describe the general physical and operational condition: very good, good, fair, poor, very poor
- A system of planned transportation facilities, services, and major improvements
- Description of the type or functional classification of planned facilities and services
- Planned capacities and levels of service
- The location of planned facilities, services, and major improvements, including a map of general location
- Description of facility parameters such as minimum and maximum road right-of-way width and number and size of lanes
- Identification of the provider of each transportation facility or service

In addition to these common requirements, the TSP identifies elements that are required for specific modal plans.

Urban Growth Management Functional Plan

Title 2 of the Urban Growth Management Function Plan (UGMFP) furthers the goal of the TPR to reduce parking spaces per capita. The City has adopted parking minimums and maximums to fulfill part of Title 2 requirements. The parking restrictions help the City achieve transportation and land use goals. Restrictions on parking are an important strategy for supporting alternatives to the automobile.

Regional Transportation Plan (Functional Plan for Transportation)

The Regional Transportation Plan (RTP) has the following requirements that are applicable to the modal plans. Many of the requirements mirror sections of the TPR, but are more specific.

- Consistency with policies, objectives, motor vehicle level-of-service measures and modal targets, system maps, and functional classifications
- Design standards for connectivity
- Transit service planning
- Alternative mode analysis
- Motor vehicle congestion analysis

CARRYING OUT THE TSP THEMES

The overall themes for the TSP (see Chapter 1) helped guide the development of the modal plans. The following discussion shows how the modal plans help carry out these themes.

2040 Growth Concept

The RTP and the 2040 Growth Concept guide the development of Portland's transportation system. These plans envision a transportation system that restrains urban sprawl by promoting mixed-use, high-density development in regional centers, town centers, and main streets. These development patterns will reduce per-person travel demand and VMT by providing a greater range of housing options, employment opportunities, and services within a given distance. They will also serve the shopping needs of adjacent lower-density residential neighborhoods, reducing the need to drive 5 to 10 miles to the nearest commercial centers. The Growth Concept also addresses the need for industrial and employment areas that are in proximity to employees and needed transportation facilities.

In other words, the Portland region's approach to transportation needs has shifted from an emphasis on *mobility* to an emphasis on *accessibility*. Instead of segregating land use types so people are required to travel long distances to satisfy their daily needs, land use types will

be carefully integrated so short trips, frequently by transit or non-motorized modes of travel, can accomplish the same purposes.

While this development strategy will have a positive effect on VMT and congestion at the city and regional level, it can also result in more travel to, from, and within the centers and main streets. The resulting traffic could potentially damage one of Portland's biggest assets: its solid residential neighborhoods. Steps will need to be taken to protect these neighborhoods as the centers and main streets grow.

Stewardship, Transportation Choices, and Environmental Sustainability

As a result of declining transportation revenues, many public resources have become limited, including existing roadways and the financial resources available to maintain and improve them. The most efficient modes of travel are those that require the least resources per person-trip.

A single-occupant vehicle (SOV) consumes approximately 20 lane feet (20 linear feet of one travel lane) of roadway (assuming a 10-foot car with 10 feet of headway). A standard Tri-Met bus carrying one person in each seat consumes about 60 linear feet of roadway, which is 1.5 lane feet per person (assuming a 40-seat bus that is 40 feet long, with 20 feet of headway).

This means that 40 persons in 40 single-occupant cars require 800 feet of roadway, while 40 persons in one bus require only 60 feet of roadway. In other words, a person riding a bus is 12 times more efficient in the use of the roadway and takes up less than eight percent of the space than a person driving an SOV.

Bicycling and walking are also more efficient than the SOV. They use no gasoline, cause no pollution, and require much less expensive facilities than those needed to support automobile, truck, and bus traffic.

Comprehensive Approach

The modal plans recognize and promote multiple and interconnected modes of travel that serve the needs of all users. It is important to note that while the TSP requires a separate plan for each mode, this does not reflect the City's approach to transportation improvements. The City is currently shifting away from a modal focus to a geographical focus, where the needs of all modes within the area are addressed simultaneously. While each modal plan will serve as a guide for projects that support that mode, Portland's transportation improvements will also balance the needs of all modes.

Planning documents can easily become a dusty remnant of a process that is quickly forgotten. The success of the TSP will be measured by how it's used over time and its ability to remain a vital guide to the City's approach to its transportation system. The TSP will use performance measures and benchmarks to evaluate how the various modes are performing and allow mid-course corrections to better meet goals.

INTERRELATIONSHIP OF THE MODAL PLANS

In some ways, the modal plans are an artificial way to think about transportation. Management of the transportation system must consider and balance all modes, and individual transportation projects may often incorporate multiple modes. In addition, some issues may be addressed primarily in one modal plan, but will also apply to other modes. Two of the plans included in this chapter focus on specific types of system improvements and strategies that benefit all modes.

Table 5.1 shows some on the interrelationships among the various modal plans. For example, access for the transportation disadvantaged is most thoroughly covered in the Transit Plan; however, audible signals that aid the blind are covered in the Pedestrian Plan because they are a pedestrian crossing strategy. If a particular topic is not covered in one plan, it may be in another of the cross-referenced plans.

Table 5.1
Interrelationships of Modal Plans

Modal Plan	Topic					
	Signalization	Transportation Disadvantaged	Traffic Calming	Education	Safety	Street Design
Motor Vehicle	X		X		X	X
Public Transportation	X	X	X		X	X
Pedestrian	X	X	X	X	X	X
Bicycle	X			X	X	X
Freight					X	X
Air, Rail, Water, Pipeline					X	
TDM/ Parking				X	X	X
TSM	X		X		X	X

Note: The cell with the shading is where most of the information about that topic is located.

The Transportation System Management (TSM) Plan is not a modal plan in the conventional sense because it does not address any one mode. Historically, TSM has been seen as a tool to manage the automobile system to make it operate more efficiently. Today, the City looks at TSM as a way to prioritize use of the transportation system for all modes. TSM measures are used to manage traffic flow on freeways, give preferential treatment to buses and light rail, allow bicycles and pedestrians to have priority treatment at key intersections, and improve the safety of the transportation system for everyone.

The Transportation Demand Management (TDM) and Parking Plan is also not a conventional modal plan because it, too, does not address a particular mode of travel. However, TDM measures and parking restrictions are vital strategies for reducing auto trips, achieving desired mode split targets, and helping the other parts of the transportation system operate more efficiently. The TDM/Parking Plan also plays a significant role in implementing the 2040 Growth Concept and achieving a desirable land use pattern.

ORGANIZATION OF THE MODAL PLANS

The modal plans are all organized in a similar manner to include the common elements required by the TSP. They are modified as necessary to address requirements specific to each mode. The common elements of the plans are:

- Requirements
  - TRP requirements
  - UGMFP requirements, if any
  - RTP requirements

- Approach to Mode

- Policy Framework
  - City of Portland Comprehensive Plan
  - Goal 6: Transportation
  - Goal 11B: Public Rights-of-Way
  - Central City Transportation Management Plan

- Existing Conditions
  - Summary of Inventory
  - Recent Major Improvements
  - Existing Deficiencies
  - Recent Studies and Plans

- Implementation Measures
  - Existing Regulations
  - New Regulations
  - Projects
  - Programs
  - Strategies

- Conclusion

MOTOR VEHICLE MODAL PLAN

Introduction

Motor vehicles include all motorized vehicles authorized to use the street system including automobiles, trucks, motorcycles, buses, streetcars, and emergency vehicles.

Portland's arterial street system is substantially complete, although not necessarily improved to City standards. Major expansions to capacity are not anticipated, with a few exceptions. A few parts of the City, notably North Macadam, do not have a network of streets to support future growth. Other areas, such as Southwest and Far Southeast, have a network of arterials, but lack local street connectivity. A well-connected street system relieves congestion on arterials and improves access for alternatives to motor vehicles, such as walking and bicycling.

To accommodate growth in travel demand over the life of the Transportation System Plan (TSP), the Motor Vehicle Modal Plan focuses on using a variety of means to maximize the use of the existing transportation network. The City's emphasis will be on implementing projects, programs, and strategies that serve developing areas, enhance safety, and improve the efficiency of the motor vehicle system.

Other plans in this chapter address the functioning of the street system. The Transportation System Management (TSM) plan addresses traffic calming, signalization, and access management.

Requirements

Transportation Planning Rule

In addition to the common elements that must be included in each of the modal plans (as described on page 5-5), the Transportation Planning Rule (TPR) requires the creation and adoption of local transportation system plans that contain the following elements specific to motor vehicles:

- Reduction of vehicle miles traveled per capita
- Identification of a system of arterials and collectors
- Description of standards for the layout of local streets and other important non-collector street connections
- Functional classifications of roads consistent with state and regional TSPs and adjacent jurisdictions

- Consistency with access management for state highways (guidance on the spacing of future extensions and connections)

- Standards for local streets that address:
  - Extensions of existing streets
  - Connections to existing or planned streets, including arterials and collectors
  - Connections to neighborhood destinations
  - Narrow street standards

- Planned safety improvements

Oregon Highway Plan

The 1999 Oregon Highway Plan (OHP) attempts to provide a multimodal transportation system that is balanced, efficient, provides accessibility, is environmentally responsible, safe, financially stable, and connects places, modes, and carriers. The OHP gives policy and investment direction for the preparation of transportation system plans statewide. Policy direction related to local government plans for motor vehicles includes the following elements:

- Coordination of land use and transportation
- System efficiency
- Maximizing limited resources
- Interjurisdictional transfers (state roads to local jurisdictions)
- Intelligent transportation systems
- Access to state highways

2000 Regional Transportation Plan

The Regional Transportation Plan (RTP) identifies a regional motor vehicle network that serves the primary 2040 Growth Concept land use components. The regional motor vehicle system is designed to provide access to the Central City, regional centers, industrial areas, and intermodal facilities, with "an emphasis on mobility between these destinations."

Motor Vehicle Policy and Objectives

The RTP contains a motor vehicle policy and a number of objectives with which Portland must be consistent. RTP Policy 13.0 calls for "a regional motor vehicle system of arterials and collectors that connect the Central City, regional centers, industrial areas and intermodal facilities, and other regional destinations, and provide mobility within and through the region."

This is to be accomplished by:

- Providing a system of principal arterials for long distance, high speed travel
- Providing a system of arterials that supports local and regional travel
- Providing a system of local streets that supports localized travel and reduces dependence on the regional system
- Maintaining an appropriate level of service during peak and off-peak travel hours
- Implementing a 'congestion management system' to identify and evaluate low-cost strategies to mitigate and limit congestion in the region

Comparison of Traffic Classifications

The RTP's traffic classification system uses different naming conventions from Portland's. Table 5.2 compares classifications used in the RTP and the TSP. Traffic Access Street is classification unique to the Central City and is similar to a District Collector outside the Central City. The RTP does not classify streets below the Collector of Regional Significance level.

Table 5.2
Comparison of Traffic Classifications

2000 RTP Classifcation	TSP Classification
Principal Arterial (Freeway)	Regional Trafficway
Principal Arterial (Highway)	Regional Trafficway
Major Arterial	Major City Traffic Street
Minor Arterial	Major City Traffic Street, Traffic Access Street (Central City), District Collector
Collector of Regional Significance*	Traffic Access Street (Central City), District or Neighborhood Collector*
Not mapped	Neighborhood Collectors, Traffic Access Street (Central City)
Not mapped	Local Service Traffic Street

Note: Only a few of the City's Neighborhood Collectors are considered Collectors of Regional Significance in the RTP.

The RTP defines Collectors of Regional Significance as routes that connect the regional arterial system and the local collector system. They serve three purposes:

1. Ensure adequate access to the primary and secondary land use components of the 2040 Growth Concept

2. Allow dispersion of arterial traffic over a number of lesser facilities where an adequate local network exists

3. Help define the appropriate collector-level movement between jurisdictions

Traffic calming may be appropriate on Collectors of Regional Significance to address the effects of regional traffic on streets that serve pedestrian-oriented land uses or cross through residential areas.

Potential Consistency Issues with the RTP Traffic Classifications

The TSP includes five motor vehicle consistency issues with RTP classifications. These are described below along with TSP recommendations to address the inconsistencies.

WATER AVENUE ON-RAMP (CENTRAL EASTSIDE INDUSTRIAL DISTRICT]

The project for the Water Avenue on-ramp is included in the RTP as Project No. 1026 – Water Avenue Ramps on I-5. It is described as "Construct new freeway access from the Central Eastside Industrial District to I-5." This project has the potential for substantial environmental impacts and limited benefits given the large costs. The City does not support the project and believes that alternatives exist which would address the access issues addressed by the project. Projects already in the RTP and TSP specifically address access issues in the Central Eastside. In some cases, the TSP recommends that project descriptions be modified to better address access and circulation. Where those projects are listed on the Preferred RTP, the TSP recommends that they be moved to the Priority RTP project list. Those projects (with recommended changes) are:

2000 RTP Financially Constrained Project List:

- **RTP 1027** – South Portland Improvements: Update RTP project description to clarify project purpose to include access from Ross Island Bridge to I-405 and I-5 southbound.
- **RTP 1032** – Southern Triangle Improvements: Change project name to "Powell-12th Avenue – Willamette River – railroad mainline – Hawthorne Bridge" and change project description to "Improve local street network and regional access routes in the area. Improve freeway access route from Central Eastside Industrial District to I-5 southbound via the Ross Island Bridge."
- **RTP 1047** – SE 7th/8th Connection: Construct new street connection from 7th to 8th Avenues at Division Street.

2000 RTP Priority Project List:

- **RTP 1029** – Water Avenue Extension: Construct new two-lane extension of street with sidewalks, bicycle lanes and landscaping to improve access to the Willamette River Greenway.
- **RTP 1030** – Ross Island Bridge Improvements: US 26 interchange improvement on east approach to Ross Island Bridge.

2000 RTP Preferred Project List (move to the Financially Constrained or Priority Project List):

- **RTP 1039** – SE Belmont Ramp Reconstruction: Reconstruct ramp to provide better access to the Central Eastside. (add to Project Year 11-20)

- **RTP 1040** – SE Clay/King Intersection Improvements: Geometric, signalization and channelization improvements to allow transit and general traffic access to westbound Clay Street from southbound Martin Luther King, Jr. Boulevard. (add to Project Year 6-10)
- **RTP 1082** – Grand Avenue Bridgeheads (Change project description to "Reconstruct west edge of SE Grand Avenue at the bridgeheads to provide sidewalks and urban standard turn lanes for vehicle and truck safety and access.") (add to Project Year 1-5)

Additional local scale projects and street operations changes referred to in the Central Eastside Development Strategy will also be considered to facilitate improved truck access and circulation (see Chapter 12 in Volume II of the TSP for more detail). Access in the Central Eastside would be further addressed in the Interstate 5/Interstate 405 Freeway Loop Study identified in Chapter 4, Refinement Plans and Studies.

NORTH LOMBARD STREET

The RTP Motor Vehicle System map identifies N Lombard Street as the regional connection to Philadelphia Street and the St Johns Bridge. The RTP classifies this route as a Minor Arterial; the 1996 Transportation Element (TE) classifies this segment as a District Collector. However, these classifications do not reflect the signed US 30 business route, which uses N Richmond and N Ivanhoe between Lombard and Philadelphia for access to and from the St Johns Bridge. The TSP recommends that the RTP be amended to identify the current routing of the US 30 Bypass (Ivanhoe and Richmond between Philadelphia and Lombard) as the Minor Arterial connection to the bridge consistent with the TSP classification of this same route as a District Collector. Street classifications and transportation connections in the area are being evaluated as part of the St Johns/Lombard Plan. The segment of Lombard between Richmond and St. Louis is a Local Service Traffic Street between

NORTH INTERSTATE AVENUE

The RTP classifies Interstate Avenue as a Major Arterial, comparable to a Major City Traffic Street in Portland (see Table 5.2, above). With implementation of the Interstate MAX project, that designation is inconsistent with the increased transit role for the street. The TSP recommends classification of N Interstate as a District Collector, which would be comparable to a Minor Arterial or Collector of Regional Significance in the RTP. The classification would reflect the street's new role as a regional transit corridor and a lesser role as a through traffic street. The TSP recommends that N Interstate be classified as a Minor Arterial in the RTP.

SOUTHEAST FLAVEL BOULEVARD/MT SCOTT BOULEVARD

The SE Flavel Boulevard/Mt Scott Boulevard corridor between SE 82nd and the City limits is classified as a Minor Arterial in the RTP. The comparable TSP classification would be Major City Traffic Street or District Collector. The City classifies the corridor as a Neighborhood Collector based on the relatively low-density existing and planned densities and the presence of other parallel facilities classified as Major or Minor Arterials in the RTP (SE Foster, SE Sunnyside, SE Johnson Creek/Idleman). The SE Flavel/Mt Scott corridor would also be difficult to build to arterial standards. The logical transition on the south end of the corridor would be Ridgecrest Road in Happy Valley. The City will request that the corridor be reclassified in the RTP as a Collector of Regional Significance within the City limits.

SOUTHEAST CLATSOP EXTENSION BETWEEN SOUTHEAST MT. SCOTT BOULEVARD AND DEARDORF/132ND

An extension of SE Clatsop west to Mt. Scott Boulevard is shown as a future Collector of Regional Significance. This extension while seeming "reasonable," as noted in the City's 1984 Mt. Scott/Powell Butte Transportation Study, "presents problems of terrain and land use." The extension would cut through the Willamette National Cemetery requiring acquisition of federally protected lands. The TSP recommends that this future street connection be removed from the RTP motor vehicle map or realigned south of the cemetery boundaries.

Motor Vehicle Performance Measures

The RTP must demonstrate that it defines an adequate transportation system to serve planned land uses. Metro adopted motor vehicle performance measures to serve as the basis for making that determination. Portland is required to adopt these performance measures for the purposes of transportation system planning. They are incorporated into Policy 11.12, Performance Measures. (Chapter 2 of this document contains the full text of the policy and the accompanying Table 11.1.)

In parts of the region designated Areas of Special Concern, the RTP allows the use of "substitute performance measures" to determine whether the transportation system is adequate to serve planned land uses. Areas of Special Concern are planned for mixed-use development, but are constrained by physical or other factors. The RTP identifies two Areas of Special Concern in Portland: the Central City west of the Willamette River and generally within the I-405 freeway ring, and the Gateway regional center. Both areas have many streets of regional significance and high levels of congestion. Other parts of the TSP (including the Chapter 10 in Volume II) discuss both areas in more detail. The Strategies section of this modal plan includes the required action plan for Gateway, beginning on page 5-33.

Street Design Policies and Objectives

The RTP contains two street design policies and one objective with which Portland must be consistent. RTP Policy 11.0 Regional Street Design calls for "designing regional streets with a modal orientation that reflects the function and character of surrounding land uses." The objective for this policy supports "local implementation of regional street design concepts in local transportation system plans." The text accompanying the policy describes the regional street designs listed in Table 5.3.

Policy 12.0, Local Street Design, directs jurisdictions to "Design local street systems to complement planned land uses and to reduce dependence on major streets for local circulation." The RTP considers all streets not on the regional motor vehicle system map to be local streets.

Comparison of Street Design Classifications

The RTP's street design classification system uses different naming conventions from Portland's. Table 5.3 compares classifications in the RTP and TSP. The classification descriptions do not deviate in any significant way from those in the RTP.

Table 5.3
Comparison of Street Design Classifications

2000 RTP Classification	TSP Classification
Freeway	Urban Throughway
Highway	Urban Highway
Regional Boulevard	Regional Main Street
Regional Street	Regional Corridor
Community Boulevard	Community Main Street
Community Street	Community Corridor
Urban Road	Urban Road
Rural Road	None in Portland
Local Street	Local Street
Boulevard Intersections	Multimodal Intersections (not mapped)

The street design classifications are described in Chapter 2, Policy 6.11. The purpose of the street design classifications is to reflect the appropriate modal orientation and reflect the function and character of planned land uses.

Boulevard Intersections are identified in the RTP, usually in centers or along main streets, at intersections with major streets where "motor vehicle traffic must be managed to limit negative impacts on other modes and adjacent land uses." These intersections that should be designed to accommodate a significant amount of motor vehicle traffic, but have "special amenities that promote pedestrian, bicycle and public transportation travel." The TSP does not map these intersections (Multimodal Intersections in the TSP) but describes the conditions where a Multimodal Intersection treatment would be appropriate. See Policy 6.11 in Chapter 2 for more details.

Potential Consistency Issues with the RTP Street Design Classifications

MCLOUGHLIN BOULEVARD
The RTP classification for SE McLoughlin Boulevard is Highway from the Grand/Martin Luther King, Jr. Boulevard south through the City. This classification implies that the street should have few or minimal multimodal elements, creating a hard edge along adjacent residential areas and making a difficult design transition from the Regional Boulevard designation north of Powell on Grand/Martin Luther King, Jr. Boulevard. The TSP recommends extension of the Regional Boulevard designation south from Grand/Martin Luther King, Jr. Boulevard to SE Woodward (one block north of Powell), the Urban Road designation from Woodward south to SE 17th, and the Highway designation south from 17th to the City limits. The City's Urban Road designation differs slightly from the RTP's by recognizing that where a Highway (Urban Throughway in the TSP) passes through a residential area, the Urban Road designation may allow a 'softer' treatment to address neighborhood livability.

ST HELENS ROAD
The RTP classification for St Helens Road (US 30) is Highway along its entire length. As noted above, this classification implies that the street should have few or minimal multimodal elements, creating a hard edge along adjacent residential areas impacting

neighborhood livability. The TSP recommends transitioning to the Urban Road classification through Linnton from NW Harbor on the south to the north end of Kingsley Park.

NORTH LOMBARD STREET

The RTP and the 1996 Transportation Element are not consistent with the currently used access route along Lombard Street between N Richmond and Philadelphia and the St. Johns Bridge. The TSP recommends that the RTP be amended to identify the current route, via Lombard to Richmond and Ivanhoe to Philadelphia, as a Community Boulevard. The TSP classifies this same route as a Community Main Street, which is equivalent in function and policy to the RTP designation. Ivanhoe between Richmond and Philadelphia is classified as a Community Corridor (equivalent to Community Street in the RTP) in the TSP to reflect its existing role as the focus for main street-type activity within the St. Johns town center. All street classifications and transportation connections in the area will be evaluated as part of the St. Johns/Lombard Plan.

SOUTHEAST CLATSOP EXTENSION BETWEEN SOUTHEAST MT. SCOTT BOULEVARD AND DEARDORF/132ND

An extension of SE Clatsop west to Mt. Scott Boulevard is shown as a future Community Corridor on the RTP street design map. This extension while seeming "reasonable," as noted in the City's 1984 Mt. Scott/Powell Butte Transportation Study, "presents problems of terrain and land use." The extension would cut through the Willamette National Cemetery requiring acquisition of federally protected lands. The TSP recommends that this future street connection be removed from the RTP street design map or realigned south of the cemetery boundaries.

TERMINI OF STREET DESIGN CLASSIFICATIONS

Based on a thorough review of RTP street design classifications, existing zoning and Comprehensive Plan map designations, and recent land use and transportation studies, the TSP recommends a number of changes to the RTP street design map. The majority of these changes involve changing the termini or transition points for street design classifications to respond to zoning or other land use elements. These requested changes are detailed in a written response to Metro. Some of the key changes are listed below:

- Adjusting the transition points between Regional Street and Regional Boulevard designations on 122nd, Division, and Foster
- Making some segments of Burnside east of I-205 between station areas Regional Streets instead of Regional Boulevards
- Adding Regional or Community Boulevard to main street/mixed use segments on Lombard, Cully, Killingsworth, Sandy, Foster, and 82nd
- Changing the Regional or Community Boulevard designations from the Broadway, Steel, Burnside, Morrison, Hawthorne, and Sellwood Bridges to Regional or Community Streets
- Changing the Urban Road designation on Lombard between St Louis and Roberts to Regional Corridor
- Changing the Community Street designation on NE/SE 39th between NE Broadway and Powell to Regional Street consistent with its traffic designation

The TSP adds street design designations on streets not included on the regional street design map to address local scale streets in the City's network.

Other RTP Requirements
In addition to adopting policies consistent with the RTP, Portland must address several other requirements relating to the motor vehicle system and street design. These requirements are summarized below from Section 6.4 and Section 6.7 of the RTP.

- *Consistency with the RTP motor vehicle map*. Portland is generally consistent with the designations on the motor vehicle map, and will forward requests for changes to the map to Metro as needed

- *Consistency with the motor vehicle performance measures or alternative performance measures.* Portland incorporates the motor vehicle performance measures and table into TSP Policy 11.12: Performance Measures, for system planning and determining congestion on regional facilities. Objective C of Policy 11.2 identifies alternative performance measures for Areas of Special Concern.

- *Compliance with congestion management analysis when Comprehensive Plan amendments or local studies recommend or require an amendment to the RTP to add significant single-occupant vehicle (SOV) capacity to the regional motor vehicle system*. This requirement is discussed in more detail below and in TSP Chapter 6: Implementation Strategies and Regulations.

- *Compliance with design standards for street connectivity*. Portland's land division regulations meet the requirements for sites that are subdividing. Portland has completed street master plans for some parts of the City. Refinement plans will address street connectivity for the remaining areas of the City.

- *Compliance with street design requirements to allow consideration of narrow street design alternatives.* Portland's land division regulations and street standards allow narrow street designs for local streets in low-density areas.

- *Compliance with street design requirements for short and direct public connections between residential and other uses.* Portland City Code Titles 17 and 33 contain requirements to include connectivity to adjacent uses.

- *Compliance with street design requirements to consider traffic calming to discourage traffic infiltration and excessive speeds on local streets.* Portland uses traffic calming extensively to protect residential neighborhoods from excessive or speeding traffic.

- *Compliance with project development requirements.* TSP Chapter 6: Implementation Strategies and Regulations, includes a project development process that is in compliance with this requirement.

- *Compliance with refinement plans identified in the RTP*. TSP Chapter 4: Refinement Plans and Studies, includes the refinement plans.

Approach to Mode

Consistent with the themes for the TSP, Portland's approach to motor vehicle mobility and access and to street design is as follows:

- Management of the motor vehicle (roadway) system must serve to further the planning objectives contained in the Portland Comprehensive Plan, Metro Regional Framework Plan, and 2000 Regional Transportation Plan.

- Portland's street system is substantially built; most increases in motor vehicle capacity will be in areas that are developing or redeveloping.

- In most cases, the primary response to roadway congestion should be to encourage and facilitate those modes of travel that make most efficient use of the limited space available.

- The safe and efficient operation of the motor vehicle system for everyone involves enforcement and education in addition to engineering solutions.

- Street design should implement the 2040 Growth Concept.

The objectives of the Motor Vehicle Modal Plan are to:

1. Support and implement the Oregon Highway Plan on freeways and other designated state routes.

2. Support and implement the 2000 Regional Transportation Plan on roadways of regional significance.

3. Manage and improve the entire roadway system consistent with the City's transportation policies and street classifications.

4. Maintain a reasonable degree of mobility for all types of motor vehicles in all areas of the City, consistent with adopted level-of-service policies.

5. Enhance motor vehicle access to and from regional and town centers. Manage the roadway system within centers to benefit local access and circulation and implement land use goals rather than to facilitate through-trips.

6. Roadway improvements should not be designed solely to address peak hour deficiencies.

7. Implement changes to the street system to solve safety-related problems when consistent with the needs of other modes of travel.

8. Look at the capacity of longer street segments or corridors rather than at single points, such as individual intersections or bridges, when considering solutions to congested areas.

9. Ensure that the street environment resulting from improvements is compatible with adjacent land use activities during off-peak periods.

10. Define locations and conditions under which transit vehicles will be given priority over all other motor vehicles in the operation of the roadway system.

11. Define locations and conditions where the needs of commercial vehicles and freight movement will be emphasized in the operation of the roadway system.

Policy Framework

City of Portland Comprehensive Plan

The City of Portland's Comprehensive Plan contains goals and policies that guide the way the City plans and implements improvements. In addition, a number of district and neighborhood plans have been adopted that contain more area-specific statements. These statements are ordered from the general to the specific as goals, policies, and objectives which are formally adopted by City Council ordinance.

The Comprehensive Plan addresses a broad range of goals for the City. Most policies relating to transportation are found in the Transportation Element of the Comprehensive Plan, which comprises Goal 6, Transportation, Goal 11B, Public Rights-of-Way; and the Central City Transportation Management Plan (CCTMP). Other policies relating to motor vehicle travel are found in Goal 5.

Goal 6 Transportation

Goal 6, Transportation, and its policies describe the many elements of the transportation system that Portland supports. The goal statement reflects the multiple functions of a balanced transportation system. An equitable transportation system fairly distributes transportation benefits and effects across the many populations of users. Goal 6 states:

> Develop a balanced, equitable, and efficient transportation system that provides a range of transportation choices; reinforces the livability of neighborhoods; supports a strong and diverse economy; reduces air, noise, and water pollution; and lessens reliance on the automobile while maintaining accessibility.

Policy 6.4, Classification Descriptions, describes how the classification descriptions and designations are used.

> Street classification descriptions and designations describe the types of motor vehicle, transit, bicycle, pedestrian, truck, and emergency vehicle movement that should be emphasized on each street.

The classifications for regionally significant streets must be consistent with Metro's RTP street classifications. Although Portland's TSP uses different names than Metro, the classifications are generally equivalent (as shown on Table 5.2 earlier in this modal plan). Objective C of Policy 6.4 states that all of a street's classifications must be considered in designing street improvements and allocating funding. That means that if a street is classified for a high level of motor vehicle traffic (e.g., a Major City Traffic Street), that function must be considered when improvements for other modes are considered (e.g., adding bike lanes). Similarly, if a street is classified as a City Bikeway, any changes to facilitate motor vehicle movement must consider the effects on bicycle movements.

Policy 6.5, Traffic Street Classification Descriptions, describes six types of traffic streets and how they should function (what kind of traffic is expected and what kinds of trips), as well as what types of land uses the streets should serve. There are eight maps that show the traffic classifications. They are located with the policy associated with each of the eight transportation districts. Policy 6.5 states:

> Maintain a system of traffic streets that support the movement of motor vehicles for regional, interregional, interdistrict, and local trips. For each type of traffic classification, the majority of motor vehicle trips on a street should conform to its classification description.

The objectives address each of the six traffic classifications. They describe the intent of each classification, compatible land uses, desired connectivity, separation or buffering (if necessary), on-street parking, and function.

- Regional Trafficways are intended to serve interregional trips where only one trip end is within a Transportation District or where the district is bypassed completely. They should not intersect with Neighborhood Collectors or Local Service Traffic Streets and should prohibit access to Local Service Traffic Streets and private property. (Objective A)

- Major City Traffic Streets are intended to serve those living and doing business within a district. They should provide connections to Regional Trafficways, serve the major activity centers within the district, and discourage use by traffic with no trip ends within the district. (Objective B)

- Traffic Access Streets are intended to access within the Central City to destinations, distribute traffic within the Central City and from Regional Trafficways and Major City Traffic Streets. Traffic Access Routes are not intended for through traffic with no trip ends in the Central City. (Objective C)

- District Collectors are intended to provide concentrated access to district activity centers and serve trips made entirely within the district. They should also distribute traffic from Major Traffic Streets to streets of similar or lower classification, and discourage use by regional traffic. (Objective D)

- Neighborhood Collectors are intended to serve as distributors of traffic from Major City Traffic Streets or District Collectors to Local Service Traffic Streets and to serve trips that both start and end within areas bounded by Major City Traffic Streets and District Collectors. (Objective E)

- Local Service Traffic Streets are intended to provide local traffic and emergency vehicle access, on-street parking and access to local residences or commercial uses, and a safe and pleasant place for pedestrians and residents. Preference should be given to the needs of residents and property owners along the street. (Objective F)

Policy 6.10, Emergency Response Street Classification Descriptions, was formulated as part of the recommendations adopted “Emergency Response Classification Study (April 1998). There are eight maps that show the emergency response classifications. They are located

with the policy associated with each of the eight transportation districts. These classifications describe how emergency response streets should function, specify appropriate design treatments to facilitate prompt emergency response, and indicate which streets are and are not eligible for traffic slowing devices.

Policy 6.11, Street Design Classification Descriptions, is a new set of street classifications created to achieve consistency with the RTP Street Design classifications. The set of classifications reflects the full range of regional street design classifications but has different names to better reflect Portland's existing street system. Street design classifications include treatments that facilitate or restrict motor vehicle movement such as number of lanes and access controls, but address the needs of other modes as well.

The objectives address each of the nine street design classifications. Street design classifications describe the land uses served, number of lanes, design elements, and design treatment.

- Urban Throughways are intended to emphasize motor vehicle travel and connect major activity centers, industrial areas, and intermodal facilities. Urban Throughways have four to six lanes, limited access, high speeds, and separated pedestrian and bicycle facilities. (Objective A)

- Urban Highways are intended to connect major activity centers and points outside the region. Unlike Urban Throughways where all intersections have separated grades, Urban Highways may include a mix of separated and at-grade intersections and include sidewalks and bicycle facilities. (Objective B)

- Regional Main Streets are intended to be in centers and along main streets and, while accommodating relatively high traffic volumes, to have moderate vehicle speeds, bicycle lanes, wide sidewalks and pedestrian amenities, and frequent crossings. (Objective C)

- Community Main Streets are intended to similar features to Regional Main Streets but usually with fewer travel lanes and relatively low motor vehicle speeds. (Objective D)

- Regional Corridors are intended for streets serving as major transit corridors but not within main street areas. Pedestrian facilities include narrower sidewalks and less frequent crossings than in Regional Main Street areas. (Objective E)

- Community Corridors are intended for areas on transit routes but not within Community Main Street areas. Community Corridors include pedestrian facilities but with fewer amenities and crossings than in Community Main Street areas. (Objective F)

- Urban Roads are intended to serve industrial areas or carry large volumes of automobile and truck traffic through residential or neighborhood commercial areas. Lanes are designed for truck movement and moderate vehicle speeds. (Objective G)

- Greenscape Streets are applied to arterials where natural or informal landscapes dominate the adjacent areas and the right-of-way, usually on scenic drives or in lower-density residential areas in wooded settings. The Greenscape Street is based on the Beautification classification in the previous TE (Objective H)

- Local Streets are the remainder of the streets in the City for street design. They are intended to respond to adjacent land uses and provide local circulation. (Objective I)

- Multimodal Intersections are locations where the needs of pedestrians are prominent but where a significant amount of motor vehicle traffic must be accommodated. (Objective K)

Policy 6.12, Regional and City Travel Patterns, provides consistency with state, regional, and City classification descriptions. It states:

> Support the use of the street system consistent with its state, regional, and city classifications and its classification descriptions.

The objectives address the appropriate use of streets, by classification.

Policy 6.13, Traffic Calming**,** emphasizes neighborhood livability as a goal and reflects the range of measures the City uses to calm traffic. This policy also addresses the desired function of Neighborhood Collectors and Local Service Traffic Streets.

Policy 6.14, Emergency Response, states:

> Provide a network of emergency response streets that facilitates prompt response to emergencies.

The objectives for this policy call for using the emergency response classification system to determine whether traffic-slowing devices can be used on a given street (Objective A), guide the routing of emergency response vehicles (Objective B), and help site new fire stations (Objective C).

Policy 6.16, Access Management, addresses the sometimes conflicting goals of moving traffic and providing access to private property. It states:

> Promote an efficient and safe street system and provide adequate accessibility to planned land uses.

The objectives address:

- Access spacing standards on state highways, based on highway classification, type of area, and allowed speeds (Objective A)

- The balance between the need for access to individual properties and the need for safe access (Objective B)

- Reducing the number of curb cuts through either consolidation or shared driveways, which can improve the function of the street for all modes (Objective C)

Policy 6.18, Adequacy of Transportation Facilities, reflects a requirement in the TPR (OAR 660-012) and the RTP to ensure that certain land use changes will not have an unacceptable impact on transportation facilities. City Code Title 33, Planning and Zoning, contains approval criteria language that implements this policy. The policy states:

> Ensure that amendments to the Comprehensive Plan (including goal exceptions and map amendments), and zone changes; conditional uses; master plans; impact mitigation plans, and land use regulations that change allowed land uses are consistent with the identified function and capacity of, and adopted performance measures for, affected transportation facilities.

Policy 6.20, Connectivity, (along with Policy 11.9) addresses TPR and RTP connectivity requirements. It states:

> Support development of an interconnected, multimodal transportation system to serve mixed-use areas, residential neighborhoods, and other activity centers.

The objectives address interconnection of local and collector streets for all modes of travel, focusing on street spacing and out-of-direction travel. Good connectivity supports all modes of travel by providing direct routes and dispersing traffic.

Policy 6.31, Regional Trafficways, calls for improving existing facilities to enhance safety and efficiency rather than building significant new roads. It emphasizes the existing regional traffic system as the mechanism to deal with regional traffic, and specifically opposes creating any new freeway that would intrude on Forest Park.

Policy 6.33, Congestion Pricing, states Portland's position that pricing or charging for motor vehicle trips (primarily automobile) on regional transportation facilities fairly allocates a scarce resource: motor vehicle capacity.

DISTRICT MOTOR VEHICLE-RELATED OBJECTIVES

District-specific objectives addressing motor vehicle movements are contained in Policy 6.34 through Policy 6.40 for the seven transportation districts: North, Northeast, Far Northeast, Southeast, Far Southeast, Northwest, and Southwest. Selected objectives are listed below; Chapter 2 contains the complete text of district policies and objectives. Central City policies and objectives relating to motor vehicle travel are summarized in a later section of this modal plan.

North District:

- Direct commuter traffic around the district to the extent possible, encouraging use of Columbia Boulevard and Marine Drive. (Policy 6.34, Objectives B)

- Remove the US 30 Bypass designation from Philadelphia and Lombard, west of Martin Luther King, Jr. Boulevard, and relocate it to more appropriate streets to minimize impacts on the St. Johns Town Center and the Lombard main street. (Policy 6.34, Objective E)

- Preserve the planned functions of Willamette Boulevard by evaluating and implementing transportation measures along North Lombard to improve its function as a Major City Traffic Street and main street. (Policy 6.34, Objective I)

- Explore opportunities for additional street connections over the railroad cut and between the Willamette River and nearby residential areas. (Policy 6.34, Objective N)

Northeast:

- Encourage automobile and truck through-traffic to use major arterials at the edges of the district to reduce peak-period traffic impacts and to preserve neighborhood livability. (Policy 6.35, Objective A)

- Enhance traffic access to regional and district commercial areas, including Lloyd Center, Hollywood, Rose City Park, Sandy Boulevard, and the neighborhood commercial district at NE 60th/Prescott/Cully. (Policy 6.35, Objective B)

- Retain Portland Boulevard's interchange with I-5, while maintaining its function and appearance as a Neighborhood Collector east of I-5. (Policy 6.35, Objective C)

- Encourage the use of I-84 and I-205 for primary access to the Columbia South Shore, Portland International Airport, and Portland International Center; encourage the use of NE Airport Way (east of I-205) and Portland Boulevard/Killingsworth (south of the Columbia Slough) as the secondary access from the interstate system. (Policy 6.35, Objective D)

- Use street dedications and street vacations as a tool to support development while ensuring connectivity. (Policy 6.35, Objective L)

- Bring substandard streets up to city standards, especially in the Cully neighborhood. (Policy 6.35, Objective M)

Far Northeast:

- Enhance the arterial street system by improving connections between Neighborhood Collectors and District Collectors and eliminating bottlenecks, such as rail crossings and viaducts, that contribute to intrusions into residential neighborhoods by commercial, industrial, and non-local traffic. (Policy 6.36, Objective A)

- Implement the transportation goals developed for the Gateway regional center by focusing on 102nd as a main street boulevard, adding new local street connections as development occurs, and managing regional traffic that may inhibit Gateway's success as a regional center. (Policy 6.36, Objective D)

Southeast:

- Direct inter-district traffic to Regional Trafficways on the edges of the district, and manage traffic on Major City Traffic Streets and other arterials primarily through transportation system management measures. (Policy 6.37, Objective A)

- Support improvements to SE McLoughlin Boulevard to ensure its function as the major north/south route for regional traffic, while maintaining its operational characteristics as a Major City Traffic Street between Powell and Reedway. (Policy 6.37, Objective B)

- Operate Neighborhood Collectors in Southeast Portland to function primarily as circulation for district traffic rather than as regional streets, even where they carry a significant amount of regional traffic. (Policy 6.37, Objective C)

- Limit left-turn access to auto-accommodating development along SE 39th Avenue, and eliminate or consolidate driveways where possible. (Policy 6.37, Objective H)

Far Southeast:

- Consider existing and future land use patterns, environmental impacts, and the need for additional connectivity of collectors when improvements are planned and designed for the arterial system, particularly SE Powell and SE Foster. (Policy 6.38, Objective A)

- Provide adequate street connections in the Far Southeast District through the development of a master street plan that provides connections for vehicles. (Policy 6.38, Objective F)

- Implement transportation improvements identified in the Lents Urban Renewal Plan that will revitalize its commercial core and environs. (Policy 6.38, Objective H)

- Implement the Gateway Concept and Redevelopment Strategy recommendations to provide street connections as redevelopment occurs, manage regional traffic impacts, and focus boulevard and main street improvements on 102nd. (Policy 6.38, Objective I)

Northwest:

- Route non-local and industrial traffic around the edges of the district on Major City Traffic Streets and Regional Trafficways. (Policy 6.39, Objective B)

- Improve access to NW 14th and 16th to support their function as connections to the commercial and industrial areas in Northwest Portland and to reduce impacts of non-local traffic on residential areas. (Policy 6.39, Objective I)

- Support the scenic and natural character of NW Skyline Boulevard by focusing non-local north/south traffic between West Burnside and NW Cornell Road on NW Miller. (Policy 6.39, Objective J)

Southwest:

- Evaluate the transportation impacts on adjacent neighborhoods when considering increases in development potential of large new or redeveloping areas, and include mitigation measures in development plans. (Policy 6.40, Objective D)

Note: The Southwest Community Plan contains other transportation objectives for Southwest. Appendix C provides the full text of these objectives.

Goal 11B Public Rights-Of-Way

Goal 11B and its policies and objectives describe how the City's transportation system should be designed and built. Motor vehicle-related policies and objectives under Goal 11B call for:

- Maintenance of the existing street system
- Construction of local streets in accordance with neighborhood land use patterns, minimizing pavement width and total right-of-way and taking the needs of both pedestrians and vehicles into account
- Connectivity of streets in accordance with City spacing standards and adopted street plans
- Evaluating the performance of the transportation system with level-of-service standards or alternative performance measures
- Encouraging the formation of local improvement districts (LIDs) in developed areas to construct street improvements, including sidewalks, drainage, and street trees

Central City Transportation Management Plan

In May 1993, a circulation and access study was conducted as part of the CCTMP. The study identified guiding policies; circulation and access deficiencies, including critical intersections and links; and a set of recommendations to improve the motor vehicle system in the Central City. The guiding policies of that study were used to develop the circulation and access policies in the CCTMP. (Chapter 2 of the TSP contains the complete text of the CCTMP policies and objectives.)

Policy 2.4, Congestion Management, is the most important CCTMP policy for the motor vehicle system in the Central City. It states:

> During the off-peak travel periods, manage the roadway system within the Central City to maintain stable traffic flow on freeways and major arterial routes and acceptable delays at intersections. During peak travel periods, greater levels of traffic congestion are acceptable, except where such congestion would result in significant additional delays to transit vehicles or contribute substantially to carbon monoxide problems. In congested areas, give priority to street improvements for modes other than single-occupant vehicles, where possible, to accommodate travel demand.

Other Motor Vehicle-Related Policies and Objectives

In addition to the Transportation Element (Goals 6 and 11B and the CCTMP), Goal 5: Economic Development, of the Comprehensive Plan contains the following policies and objectives that relate to the motor vehicle system.

Policy 5.4, Transportation System, states: "Promote a multi-modal regional transportation system that encourages economic development."

Objective A states:

> Support the maintenance and efficient use of the transportation improvements to facilitate the efficient movement of goods and services in and out of Portland's major industrial and commercial areas. Ensure access to inter-modal terminals and related distribution facilities.

Policy 5.10, Columbia South Shore, Objective F states:

> Protect the transportation capacity of the area's highways and roads through both review of individual projects and identification and construction of new facilities which increase the system's capacity.

Most adopted neighborhood or area plans have policies and/or objectives that address the motor vehicle system within their boundaries. These plans typically focus on traffic safety and access to jobs, and on the negative aspects of motor vehicles, such as environmental impacts and cut-through traffic.

Existing Conditions

Summary of Roadway Inventory

A number of databases and management systems contain Portland's roadway inventory. Portland Office of Transportation (PDOT) departments use these systems to make decisions about the maintenance, operation, and improvement of the transportation system. The TSP Inventory (Volume III, Section B) describes these systems in detail.

The 1999 Portland Transportation System Status and Condition Report describes the street system. As of that report, Portland had 1,236 miles of improved arterials and 2,605 miles of improved local streets. An additional 140 miles of streets were unimproved. The Oregon Department of Transportation (ODOT) maintains 11 state highways within the City.

Existing Deficiencies

Projected Traffic Volumes

Traffic volumes are expected to continue to grow throughout the region over the next 20 years. In the City of Portland, this growth will occur primarily on freeways and on certain regional arterial streets. Increases in traffic volumes do not necessarily result in unacceptable traffic congestion. Collector and neighborhood streets in most Portland neighborhoods are likely to experience only moderate traffic increases. However, both traffic volume and congestion are expected to increase substantially in many of the east-west streets in Southeast, Far Northeast, and Far Southeast neighborhoods.

Table 5.4 shows the major corridors in Portland that will experience significant growth in motor vehicle trips, according to the 2000 RTP. The volumes reflect the peak direction during the evening two-hour peak period, using the 2020 priority system in the RTP. By looking at corridors that serve the same general destinations, it is possible to consider overall capacity rather than the capacity of individual streets.

The large increase in traffic volumes in the 172nd/Foster/190th corridor reflect future large increases in population growth in the far southeast part of the region, resulting from the inclusion and development of new lands inside the urban growth boundary over the next 20 years.

Table 5.4
Comparison of Motor Vehicle Volumes
(Two-hour Peak Traffic in Peak Direction)

Corridor	1994 Volumes	2020 Priority System Volumes	Difference 1994-2020
I-5 North, MLK Jr., Interstate, and Greeley (south of Lombard)	18,799	20,777	1,978 (+11%)
I-5 North Interstate Bridge (north of Lombard)	11,504	17,348	5,844 (+51%)
I-84, Broadway-Weidler, Burnside, Stark, Belmont, Morrison, and Hawthorne	28,267	29,698	1,431 (+5%)
Powell, Division, and Holgate (west of I-205)	7,243	8,226	983 (+14%)
I-5 and Barbur	13,716	15,147	1,431 (+11%)
US 26, Cornell, Burnside, and Beaverton-Hillsdale Highway	19,156	20,834	1,678 (+9%)
Highway 30	3,123	4,014	891 (+29%)
Macadam, 17th, McLoughlin	10,215	15,195	4,980 (+49%)
Sandy and I-84 (east of I-205)	12,365	14,369	2,004 (+16%)
Halsey, Glisan, Burnside, Stark, Division, and Powell (east of I-205)	6,077	9,887	4,648 (+30%)
172nd, Foster, 190th	1,783	8,575	6,792 (+381%)
I-205, 82nd, and 92nd	14,315	18,752	4,437 (+31%)

Source: Metro 2000 RTP

Projected Congestion Problems

Congestion levels are expected to grow, although not equally among areas. Some streets with relatively little congestion today are expected to see little or no increase in traffic. Some streets with high congestion today may not see a big increase in traffic volume (because they are already operating at near capacity), but the number of hours they are congested each day will increase. Other streets with little current congestion will see large increases in traffic volumes, which will result in significant new congestion.

All the freeway routes through Portland will be more congested. On some facilities, average vehicle speed will decrease substantially; I-205 is the most significant example. On other facilities, average rush-hour speed may not change much because it is already very low, but the number of hours the facility is congested each day will grow significantly (i.e. the evening rush hour may increase from one to two hours). I-5 North, I-84, or McLoughlin Boulevard may be good examples of this situation.

Portland reviewed the streets that exceed acceptable levels of service in the RTP in 2020 within its boundaries. A brief analysis of each corridor is discussed in Chapter 10, Needs Assessment, of Volume II of the TSP. In each corridor, a review of model assumptions and

recent network changes showed that the streets would operate at acceptable levels of service and that an operational level of analysis would, in all likelihood, confirm these findings.

RTP Subarea Analysis

The RTP breaks the region up into subareas to analyze future congestion. The RTP uses the word 'congestion' when a particular highway or street does not meet the motor vehicle performance measure for that corridor (as defined in Chapter 2, Table 11.1, of the TSP).

PROPOSED REFINEMENT PLANS

The following corridors have unresolved transportation issues and will be subject to refinement planning. (Chapter 4: Refinement Plans and Studies, provides additional description.)

- Interstate 5 North (Marquam Bridge to Interstate Bridge) – the I-5 Trade and Partnership Project is underway to study this corridor
- Northeast Portland Highway (Rivergate industrial area to I-205)
- I-205 North (I-84 to Clark County)
- 1-205 Center (Oregon City to I-84)
- North Willamette crossing (between the north peninsula area and Highway 30)
- Powell Boulevard/Foster Road corridor (Portland Central City to Gresham regional center)
- Highway 43 (Portland Central City to Lake Oswego town center)
- Barbur/1-5 corridor (Portland Central City to Highway 217)

OTHER SUBAREA ISSUES

The RTP identifies the following areas and issues to be addressed in Portland's TSP:

- Portland International Airport: A proposal to add operational capacity to the airport (for example, a third runway) should include an analysis of impacts and mitigation strategies for I-205, I-84, NE Portland Highway, AirMAX, and Columbia Corridor arterials. (The 'Strategies' section of this modal plan and the Air, Rail, Water, and Pipeline modal plan discuss the City's regulation of the airport.)
- East-West Arterials: The RTP subarea analysis references east-west arterials in three places. Arterials parallel to I-84 between I-5 and I-205 will experience congestion over the plan period; all arterials between I-84 and SE Powell will be affected to some extent. The TSP identifies transit, pedestrian, and bicycle improvements for some of these arterials. The 'Strategies' section of this modal plan provides a more detailed response to this area's congestion.
- Going Street/Greeley Avenue: Going Street at Greeley Avenue will experience localized congestion during the evening peak period. In addition to projects identified in the RTP,

the TSP has several projects designed to alleviate this congestion and improve transportation operations at this intersection and its vicinity. The 'Strategies' section of this modal plan provides more detail.

- Gateway Regional Center: From a transit perspective, Gateway is the second most accessible center in the region. As the RTP notes, however, spillover traffic from the I-5 corridor exceeds the level-of-service (LOS) policy on a number of east/west corridors in the Gateway area, including Halsey, Glisan, Burnside, Stark, and Division streets.(Chapter 4: Refinement Plans and Studies, provides more detail.) The 'Strategies' section of this modal plan discusses the Gateway action plan to address this deficiency.

Connectivity Deficiencies

The street system for the City of Portland is nearly complete. Soils, terrain, environmental concerns, and previous development have all affected the degree to which connectivity has been or will be achieved in specific areas.

The state TPR requires a master road plan for each jurisdiction. In turn, Metro's Urban Growth Management Functional Plan and the RTP require master street plans that emphasize connectivity. The RTP establishes a standard of at least one street connection every 530 feet, recognizing limits to this standard for stream crossings or other barriers. A lack of connectivity reduces the overall capacity of the street system and increases out-of-direction travel, affecting both congestion and vehicle-miles of travel.

The TSP includes master street plans and other street circulation area plans that identify and evaluate places where the street system does not provide sufficient connectivity, and recommends where additional connections should take place. (See Volume II, Chapter 11: Master Street Plans.) It will be most difficult to achieve full connectivity in Southwest Portland and Far Southeast Portland because of barriers that affect the land, such as steep slopes, water features, environmental zoning, and development.

Completed street system plans in Portland include:

- South Portland Circulation Study — August, 2001
- Southwest Portland Master Street Plan — July 2001
- Far Southeast Portland Master Street Plan — July 2001
- Gateway — February 2000
- Bridgeton Neighborhood Plan — November 1997
- North Macadam — September 1996
- River District Right-Of-Way — April 1996
- Airport Way Secondary Infrastructure Plan — August 1994

Safety Management

Safety management describes a variety of strategies to make the transportation system safe for all modes of travel, including monitoring, education and outreach, enforcement, and engineering solutions. The Police Bureau is responsible for enforcement, which includes traditional ticketing and the newer photo enforcement for speeding and running red lights. The Oregon Legislature sets the scale of the electronic enforcement allowed in local jurisdictions. Educational and outreach efforts include elementary school programs on safe bicycling, informational booths at local events, and encouraging the use of alternative modes of travel through promotions and events. Engineering efforts include the wide range of

traffic calming strategies, pavement markings, signing and signal changes, and intersection improvements.

PDOT identifies high-collision locations within the City each year. Accident data from the State of Oregon are analyzed in regard to the number of injury, fatal, and property damage accidents per entering vehicle and the cost of accidents per arterial intersection. The most recent complete data are for 1994 through 1997, as shown below. The list changes each year, based on the number of crashes, traffic volumes, and improvements to the intersections. High-collision locations for the period of 1994-1997 (most recent complete data) are listed below:

- NW Germantown Road/Bridge Avenue
- SE Stark Street/3rd Avenue
- SW Taylor Street/15th Avenue
- N Cook Street/Williams Avenue
- SW Oak Street/5th Avenue
- SW Front Street/Ross Island Bridge
- N Broadway at Williams Avenue/I-5 northbound on-ramp
- SE Division Street/39th Avenue
- SE Washington Street/103rd Avenue
- N Broadway at Vancouver Avenue/I-5 southbound off-ramp

Additionally, intersections with more than six accidents over a four-year period are called 'major intersections' and are ranked in three groups:

- Level A – Critical Condition. Intersections with 20 or more accidents within the last four years and an accident cost greater than or equal to $48,000 per million entering vehicles, or an accident rate equal to or greater than 1.60 accidents per million entering vehicles.

- Level B – Fair Condition. Intersections with 20 or more accidents within the last four years and an accident cost less than $48,000 per million entering vehicles, or an accident rate less than 1.60 accidents per million entering vehicles.

- Level C – Good Condition. Intersections with 6 to 19 accidents within the last four years.

There were 1,204 major intersections in 1999. Of these, 18 (about two percent) were in critical condition and needed immediate attention or study; 232 (19 percent) were in fair condition and needed improvements to reduce accidents; and the remaining 954 (79 percent) had a relatively low accident frequency and were in good condition.

Members of the community report other safety-related situations to PDOT. The vast majority of these complaints relate to speeding. PDOT staff gather information about and evaluate these complaints.

A number of modifications can be used to reduce accidents, including signing, striping, signal phasing, adding new signals, and widening or restricting lanes. Some locations require major reconstruction projects that go beyond a traffic solution alone. Projects selected to reduce accidents are based on feasibility, cost, and available funding.

Based on the collision data, approximately 20 percent of the City's major intersections are in critical or poor condition. The unmet need for addressing these intersections is estimated to be $8.9 million.

Issues from District Needs Assessment
In fall 1998, PDOT held TSP workshops in each of the Transportation Districts to gather information about transportation issues and community needs. Participants were asked to identify needed transportation improvements in their neighborhood and indicate their top three priority issues, or 'transportation values.'

Three of the top seven values identified in the workshops relate directly to motor vehicle travel: manage congestion, provide connectivity, and safety and livability on local streets. Managing congestion was especially important in the Northwest, Northeast, Far Northeast, and Far Southeast districts. The more suburban districts—Southwest, Far Northeast, and Far Southeast—emphasized the need for greater street connectivity. The Northwest, North, Northeast, and Southwest districts identified enhanced safety and livability on local streets as a top priority (discussed primarily in regard to traffic speeds and the interaction between pedestrians and automobile traffic).

Implementation Measures

Existing Regulations

A number of City Code titles regulate motor vehicle operations, including Title 16 (Vehicles and Traffic), Title 17 (Public Improvements), and Title 33 (Planning and Zoning). The City Council is the 'road authority' for all public streets, except state highways.

Title 16 regulates parking in the public right-of-way, towing of vehicles, taxicabs, the use of transit lanes, and miscellaneous activities affecting the right-of-way, such as reckless driving.

Title 17 primarily regulates public rights-of-way uses other than motor vehicle operation. It does, however, regulate special traffic control districts and driveways.

Title 33 primarily regulates activities on private property rather than on public rights-of-way. Some Title 33 regulations, however, affect streets and their use. The land division regulations were revised (effective date July 1, 2002) to incorporate connectivity standards consistent with the RTP.

New Regulations

Titles 17 and 33 are being be amended to address connectivity on large sites that are developing or redeveloping, including institutional uses that require land use review and uses allowed by right, such as shopping centers in commercial zones. The intent is to require connectivity comparable to what is currently required for land divisions (530-foot spacing for streets and 330-foot spacing for pedestrian/bicycle accessways). See Chapter 6, Implementation Strategies and Regulations for more detail.

Projects

Many TSP projects over the next 20 years will include improvements to the street system, but few will focus strictly on enhancing capacity for motor vehicle travel. Some of the most significant street improvements on the TSP project list are described below, with project numbers in parentheses. (Chapter 3 contains the complete project list and additional details.)

- Construct new street connection from SE 7th to SE 8th at Division (Project No. 20004)
- Widen SW Bancroft (River Parkway – Macadam) in conformance with North Macadam district street standards (Project No.20006)
- Construct SW Bancroft/Hood/Macadam intersection improvements, including widening, realignment, and signal upgrades (Project No. 20007)
- Improve SW Bond (River Parkway – Bancroft) to serve as the primary north-south mobility street in North Macadam district (Project No. 20009)
- Redesign E Burnside/Sandy/12th intersection to improve safety for all modes (Project No. 20013)
- Construct SE Clay/MLK Jr. intersection improvements to allow traffic access from westbound Clay to southbound MLK Jr. (Project No. 20018)
- Widen Going Street Bridge at Swan Island entrance to improve traffic access to industrial area (Project No. 30013)
- Modernize I-5 freeway and ramp system to improve access to the Lloyd District and Rose Quarter (Project No. 30021)
- Widen I-5 to three lanes in each direction from N Lombard to the Expo Center exit (Project No. 30022)
- Improve I-405/N Kerby interchange to calm traffic at off-ramp (Project No. 30029)
- Signalize NE 33rd/Marine Dr intersection to facilitate traffic and freight movement Project No. 40006)
- Widen NE Airport Way (82nd – PDX terminal) to three lanes in each direction (Project No. 40021)
- Construct an at-grade intersection connection from NE Columbia Bl/82nd to US 30 Bypass/I-205 interchange and widen I-205 southbound on-ramp at NE Columbia Blvd (Project No. 40021)
- Add signal and improve turn lanes at Alderwood Rd/Cornfoot Rd intersection (Project No. 40035)

- Realign 62nd/Going/Cully intersection (Project No. 40041)
- Extend NE Marx (82nd – 87th) and signalize NE 82nd intersection (Project No. 40060)
- Widen NE 138th (Sandy – Marine Drive) to address traffic flow issues (Project No. 50008)
- Reconstruct primary local main street in the Gateway regional center on NE 99th (Weidler – Glisan) and NE Pacific (99th – 102nd) (Project No. 50014)
- Widen Sandy Boulevard (122nd – 185th) from three to five traffic lanes, with sidewalks and bike lanes (Project No. 50035)
- Add traffic signal at the NW112th/US 30 intersection (Project No. 60001)
- Realign offset intersections at US 30/Saltzman and US 30/Balboa (Project No. 60018)
- Construct intersection improvements at high accident locations on NE/SE 60thincluding Belmont, Glisan, and Stark (Project No. 70006)
- Replace substandard Bybee Boulevard bridge with two-lane bridge and bike lanes (Project No. 70012)
- Construct improvements on SE 174th and Jenne Road to increase safety and capacity to accommodate increased residential development (Project No. 80007)
- Construct multimodal improvements and services including sidewalks, pedestrians crossings, and bike lanes and transit and motor vehicle capacity as needed to SE Powell – I-205 to City limits –(Project No. 80015)
- Redesign the Beaverton-Hillsdale/Bertha/Capitol intersection to improve safety (Project No. 90028)
- Widen Garden Home Rd (Capitol Hwy to city limits) to three lanes, with signal at Multnomah intersection (Project No. 90033)
- Construct safety improvements at Barbur/Capitol/Huber/Taylors Ferry, including traffic signal improvements (Project No. 90069)

Programs

Many potential changes to the motor vehicle system fall below the threshold for inclusion on the TSP 20-year project list. They may, however, still be important to how the transportation system functions in the future, the livability of Portland's neighborhoods, and access to destinations. The following is a partial listing of small projects or other transportation actions that are identified in the most recent capital improvement program and help implement the Motor Vehicle Modal Plan. They are grouped by category and are not ranked.

Local Street Development

- Improvement of local streets in low-income and moderate-income areas to City standards

Neighborhood Safety and Accessibility

- Safety and operations improvements at various locations. These may include widening, realignment, channelization, signals, landscaping, pedestrian and bicycle improvements, and right-of-way acquisition

Preservation and Rehabilitation

- SW Market and Clay reconstruction in downtown Portland

- Rose Garden Arena area redesign and remodel of traffic control at Broadway/Vancouver, Williams/Victoria, and Weidler/Victoria to improve safety for all modes

Safety and Congestion Management

- Opticom (signal preemption) for 150 intersections to allow emergency vehicles and buses to receive priority treatment at signals

- Road reconstruction on SE Washington between 82nd and 109th, including signal improvements at 102nd and 103rd

- Design and construction of roundabouts to improve traffic flow

Other safety-related projects are implemented with funding from the state's Hazard Elimination Fund (HEP) and some private grants, such as the State Farm Insurance Safety Grant. Both funds are used for specific identified safety problems that usually require a study and/or investigation to qualify for the grants. PDOT contributes a percentage of the cost for HEP projects. Current HEP projects include the NE Sandy corridor from Burnside to NE 33rd, and Lombard from St. Johns to Martin Luther King, Jr. Boulevard.

Strategies

Neighborhood Traffic Safety Plan

The Neighborhood Traffic Safety Plan (NTSP) is a community-based education, enforcement, and engineering effort designed to reduce traffic safety problems. The plan is guided by a City Council appointed Traffic Safety Committee that includes representatives from schools, bicycle and pedestrian advocacy groups, neighborhood and business associations, public health advocates, Police Bureau, Tri-Met, and the Office of Transportation. The NTSP includes action plans for residents and schools to implement as they address issues such as neighborhood speeding and traffic safety at schools. City staff and the committee will provide recommendations on the optimal allocation of resources for traffic safety efforts and collaborate on an annual "State of Portland's Neighborhood Traffic Safety Report."

Congestion Management

The RTP requires certain actions to be considered when local transportation plans, multimodal corridor and subarea studies, mode-specific plans, or special studies amending the comprehensive plan are developed and when the studies recommend adding "significant

single-occupancy vehicle (SOV) capacity to the regional motor vehicle system." The RTP identifies significant capacity to be "any increase in general vehicle capacity designed to serve 700 or more additional vehicle trips in one direction in one hour over a length of more than one mile." This standard applies only to recommended capacity projects that are not included in the RTP.

When a recommended capacity project meets or exceeds this standard, the following congestion management alternatives must be considered before the project is added to a local TSP.

1. Transportation demand strategies that further refine or implement a regional strategy identified in the RTP
2. Transportation system management strategies, including intelligent transportation systems (ITS), that refine or implement a regional strategy identified in the RTP
3. Subarea or local transit, bicycle, and pedestrian system improvements to improve mode split
4. The effect of a comprehensive plan change on mode split targets, and actions to ensure the overall mode split target for the local TSP is being achieved
5. Improvements to parallel arterials, collectors, or local streets, consistent with connectivity standards, to address the transportation need and to keep through-trips on arterial streets and provide local trips with alternative routes
6. Traffic calming techniques or changes to the motor vehicle functional classification to maintain appropriate motor vehicle functional classification

Upon demonstration that the above considerations do not adequately and cost-effectively address the problem, a significant capacity improvement may be included in the comprehensive plan. The RTP establishes the approaches that can be taken to make this amendment. Metro and the local jurisdiction must consider the following options:

1. Amendments to the boundaries of a 2040 Growth Concept design type
2. Amendments or exceptions to land use functional plan requirements
3. Amendments to the 2040 Growth Concept
4. Designation of an area of special concern and the associated requirement for an action plan to mitigate congestion

Portland very infrequently considers a motor vehicle capacity project of a magnitude that would trigger this analysis. If this type of project is recommended through a study, Portland will follow the congestion management process specified by the RTP.

Gateway Action Plan

The RTP identifies the Gateway regional center as an 'area of special concern'. The RTP directs Portland to:

> . . . examine the ability of local streets in these areas to absorb travel demand to a degree that cannot be measured in the regional model. A traffic management plan for these streets should be integrated with the overall TSP strategy, but should establish a specific action plan and benchmarks for streets determined to exceed the LOS policy. . . Alternative mode choices should be identified to further reduce travel demand. The local TSP should also consider strategies for providing better access to LRT, including park-and-ride facilities at station areas.

The TSP has a large number of projects in the Gateway area designed to make the regional center function better and increase the mode split for non-SOV travel. Other non-transportation project strategies and activities will also improve the jobs/housing balance and support mixed-use development.

Gateway has been the subject of several land use and transportation studies over the past few years. City Council approved an Opportunity Gateway Redevelopment Strategy and Concept Plan (Opportunity Gateway) on February 23, 2000. Opportunity Gateway contains a set of principles and implementation measures to help Gateway become a regional center while improving its livability and the livability of adjacent areas. One element of Opportunity Gateway is a concept plan map that is the basis for an 'interim right-of-way plan' to guide the development and redevelopment of streets within Gateway.

Opportunity Gateway, the adopted Gateway Regional Center Urban Renewal Plan (June 2001), the regulatory framework of the Gateway Plan District, and the numerous transportation improvements identified in the RTP and TSP make up the "action plan" for Gateway. The goal of these efforts is to create a regional center that has a much-improved balance of jobs and housing, provides a wide range of commercial and offices uses, and creates an interconnected network of streets. The key elements of the action plan follow.

Opportunity Gateway

- Create four subareas or neighborhoods: Halsey Weidler main street, Gateway station area, 102nd and Burnside station area, and the employment district south of Stark and Washington.
- Develop a park.
- Develop new housing, such as the Russellville project at 102nd and Burnside.
- Implement the local street plan identified on the concept plan and map.
- Realign NE 99th at NE Glisan to improve intersection performance.
- Identify an enhancement program to include gateways, beautification of traffic islands, a signage program, and landscaping of the I-205 berm.
- Assemble fragmented ownerships into development-ready parcels.
- Develop an education center in coordination with educational institutions.

- Redevelop transit to improve access and parking and add commercial and civic activities.

Gateway Regional Center Urban Renewal Plan
The primary principle of this urban renewal plan is to "establish the Gateway regional center." The subordinate principles are:

- Utilize informed public participation – inclusion, education, and coordination with other agencies.

- Optimize investment in the district – strategically use tax increment funds to leverage other public and private funds.
- Establish a distinctive identity – create a sense of cohesiveness with unifying elements such as open spaces, street furniture, and landscaping.

- Support compact development – locate transit-supportive uses close to light rail and transit, redevelop surface park-and-ride lots to more intense uses.

- Support a mixture of land uses – incorporate a mix of uses in development along commercial corridors, including housing or offices on upper floors.

- Create a mixture of public spaces – place a plaza near the transit center, use street trees and landscaping in street design, accommodate recreational activities, including a linear parkway.

- Establish a pedestrian orientation – pedestrian medians in wide streets, curb extensions, wider sidewalks, pedestrian scale at street level; concentrate highest level of amenities along the 102nd boulevard and the 99th and Pacific main streets.

- Expand and improve travel options – establish a dense street grid; facilitate non-auto trips by improving sidewalks, bicycle facilities, and transit facilities; use traffic management measures to improve safety for all modes and traffic flow; use demand management measures to reduce single-occupant vehicle trips.

- Expand and improve housing options – develop and implement a housing strategy; include a diversity of housing types and tenures.

- Enhance economic opportunities – provide financial assistance to existing businesses, site assembly, incentive programs.

Opportunity Gateway, the Gateway Regional Center Urban Renewal Plan, and the Portland Development Commission's Five Year Plan planning process and yearly budget updates will guide the allocation of urban renewal funds in the district.

Gateway Plan District
City Council adopted the Gateway Plan District into Title 33, Planning and Zoning, in 1996, in conjunction with the Outer Southeast Community Plan. The regulations of the plan district are intended to:

- Encourage new development and expansion of existing development to promote the district's growth and light rail transit ridership.

- Promote compatibility between private and public investments along the light rail system though building design and site layout standards.

- Require new development and expansions of development to create attractive and convenient facilities for pedestrian and transit patrons.

These regulations are in addition to regulations in base zones, design review guidelines, and additional use and development regulations. The Gateway regional center is zoned for a mix of high-density development, including commercial, multi-family residential, and employment uses. Some uses, such as vehicle repair, are prohibited because they are not compatible with the transit orientation of the district.

Housing is required in some commercial and employment zones as a part of development on large sites to "prompt developers and owners to explore and take advantage of opportunities for more intense housing and mixed-use projects." Residential zones have minimum density requirements, and some housing types are prohibited.

Development standards are sometimes more restrictive than the base zones would allow; for example, drive-through facilities are prohibited throughout the plan district. In other cases, the standards are more lenient; for example, buildings located west of 127th buildings are allowed to be 125 feet high.

Development is required to be built at a minimum of 0.5 to 1 floor area ratio in commercial and employment zones. Large sites are required to provide open areas, including walkways and public or private streets. Other open areas may include parks, plazas, public fountains, and landscaping. Site design must include safe, pleasant, and convenient pedestrian and bicycle connections between buildings and connecting to light rail; parking placed beside or behind development; and entrances oriented to the street. No required parking and maximum parking ratios ensure that vast areas will not be devoted to surface parking lots, as is frequently the case for existing development.

Gateway Transportation Projects

The TSP and RTP identify the following transportation projects for Gateway and the immediate vicinity to address future deficiencies:

- Project Nos. 50002, 50003 (102nd boulevard and safety improvements – phases 1 and 2)

- Project Nos. 50014, 50015 (99th & Pacific - phases 1, 2, and 3)

- Project Nos. 50018, 50019, 50020 (pedestrian and local street improvements – phases 1, 2, and 3)

- Project No. 50021 (Gateway TMA)

- Project No. 50022 (Gateway-wide traffic management)

- Project No. 50023 (Glisan bikeway – 106th to 162nd)
- Project No. 50039 (Halsey boulevard improvements and traffic management)
- Project No. 50024 (Glisan boulevard improvements and traffic management)
- Project No. 70034 (I-205 multi-use path crossings)
- Project No. 80017 (Stark/Washington bikeway)
- Project No. 80018 (Stark/Washington boulevard improvements and traffic management)

The transportation analysis for Gateway included a mode split analysis that evaluated the effects of land use and transportation changes on mode split. Opportunity Gateway guides improvements in mode split. The key elements are:

1) Reduce the impacts of the park-and-ride by consolidating parking in a mixed-use parking garage.
2) Create a finely grained local street network to increase connectivity.
3) Place buildings close to streets to make a more attractive pedestrian environment.
4) Add wider sidewalks, bike lanes, open space, street lighting, and crossing signals to improve walking and bicycling opportunities.
5) Implement other traffic control changes to mitigate the impact of regional through-traffic.

Based on these changes, the mode split figures shown in Table 5.5 were derived:

Table 5.5
Existing and Projected Mode Splits

Home-based Work Trips	**1994 (percent)**	**2020 (percent)**
Drive alone	78	59
Carpool	14	16
Transit	5	19
Bike	1	3
Walk	2	3
All Other Trips	**1994**	**2020**
Auto	95	89
Transit	3	6
Bike	1	1
Walk	1	4

The RTP non-SOV mode share goal for regional centers such as Gateway is 45 to 55 percent for 2040. The 41 percent non-SOV mode share for home-based work trips in 2020 shows that Gateway can meet this goal. As a regional center matures and residential densities increase, the non-SOV share tends to rise.

Southeast Arterials

The RTP forecasts that the east-west arterials in southeast Portland between the Central City and I-205 will experience some congestion during the evening two-hour peak period, possibly as a result of significant congestion on I-84. Although light rail and expanded bus service on parallel streets provide effective, reasonable alternatives to I-5, traffic volumes are expected to increase on these east-west arterials south of the freeway. The RTP states that additional measures are needed to address this congestion, beyond those identified in the RTP.

Southeast Portland is characterized by an extensive grid of arterials and local streets that exceeds the RTP standard for connectivity. Since the regional model does not include the local street network, the RTP be overestimating the demand for travel on the arterials. This network of streets relieves congestion by quickly dispersing local traffic onto local streets. Other land use and transportation factors that ameliorate the projected congestion are discussed below.

Land Use

Southeast Portland contains of a number of main streets (Burnside, Hawthorne, Belmont, Foster, Woodstock, and Division) that function much like a town center. The main streets have a mix of residential, retail, and commercial uses that together supply many of the daily needs of the area residents. By having a mix of uses in close proximity, many daily trips – work, shopping, education – can be made by walking, bicycling, or transit, thereby reducing congestion.

Transportation

Southeast Portland has existing high-quality transit service on most arterials (Glisan, Burnside, Belmont, Hawthorne, Division, Powell, Holgate, Woodstock, 39th, 52nd, 82nd, and Foster), resulting in a high mode split for non-SOV travel. The RTP anticipates improvements to increase transit frequency on Belmont, Hawthorne, Division, and Powell/Foster. Maximum parking ratios have been adopted for all non-residential uses, and some commercial areas (usually along main streets) require no off-street parking.

Southeast TSP Projects

In addition to increased transit frequency (as discussed above), a number of projects are proposed for southeast Portland to encourage more non-SOV travel and alleviate congestion. The RTP and/or TSP identify the following projects:

- Project No. 20013 (Burnside/Sandy/12th intersection – RTP, TSP)
- Project No. 20014 (Burnside: SE 12th to W 23rd – RTP, TSP)
- Project No. 70009 (Belmont street and pedestrian improvements between 12th and 43rd - RTP, TSP)

- Project No. 70010 (Burnside pedestrian (TSP only) and bicycle – RTP, TSP)
- Project No. 70009 (Belmont street and pedestrian improvements – RTP, TSP)
- Project No. 70013 (Division multimodal improvements – RTP, TSP)
- Project No. 70021 (Foster pedestrian-to-transit improvements – RTP, TSP)
- Project Nos. 70031 and 70033 (Holgate bike lanes, phase 1 and 2 – RTP, TSP)
- Project No. 70004 (26th and Holgate intersection improvements – TSP)
- Project No. 70005 (39th between Sandy and Woodstock pedestrian, safety, and signalization improvements – TSP)
- Project No. 70006 (60th corridor and intersection improvements – TSP)
- Project No. 20023 (SE 11th/12th/RR intersection improvements – TSP)
- Project No. 70032 (Holgate multimodal improvements – TSP)
- Project No. 70045 (Powell pedestrian and intersection improvements – TSP)
- Project No. 20023 (TSM improvements – TSP)

Congestion affects traffic movement and hinders alternatives to the automobile from negotiating the street network. It can also negatively impact the livability of residential neighborhoods. Traffic calming measures can help alleviate unacceptable traffic volumes and speeds. In addition to the many traffic calming projects that have been installed in southeast Portland over the last decade, new projects are targeted for areas where high traffic volumes and speeds affect safety and livability.

Portland International Airport

The Port of Portland has an approved airport master plan that will continue to be in effect for several years. The plan includes some expansion in facilities. For airport expansion beyond that which is currently approved, the Port must address the related transportation impacts in a new master plan or other regulatory tool (such as a plan district) and include measures to mitigate these impacts. The Port is currently working with the City and other affected agencies about future expansion plans and regulatory approaches.

Going Street/Greeley Avenue

The RTP states that Going Street at Greeley Avenue will experience localized congestion in the future during the evening two-hour peak period. The Union Pacific railyards and Swan Island port facilities will remain accessible from Greeley and Going during this peak time, but congestion on I-5 will limit truck access to these streets. The RTP contains several projects to address this congestion in the vicinity of Going and Greeley. The I-5 Trade

Partnership study now underway is developing potential strategies for I-5. The following projects that are identified in the RTP and TSP will adequately address traffic congestion in the Going/Greeley vicinity:

- Project No. 30012 (bikeway on Going – RTP, TSP)
- Project No. 30013 (seismic upgrade to Going Street bridge– RTP, TSP)
- Project No. 30015 (ITS – RTP, TSP)
- Project No. 30017 (Greeley/Interstate bike and pedestrian improvements – RTP, TSP)
- Project No. 30052 (Swan Island TMA – RTP, TSP)
- Project No. 30016 (climbing lane and interchange improvements - TSP)

Conclusion

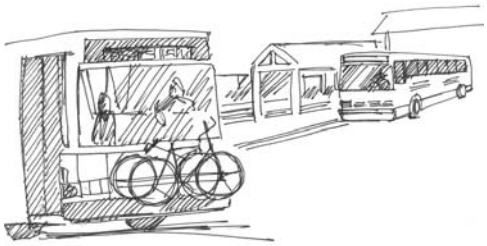
Portland's motor vehicle system is substantially complete and new streets will, for the most part, serve developing areas that lack a complete street system. The City's motor vehicle system does need significant upgrading to improve the safety of all users, whether in vehicles, on bicycles, in buses, or on foot. The City's emphasis will continue to be placed on implementing projects, programs, and strategies that serve developing areas, enhance safety, and improve the efficiency of the motor vehicle system.

The subareas identified by the RTP as experiencing high levels of congestion in the future have been reviewed in this modal plan. The TSP analysis includes additional strategies and projects that will adequately address future congestion.

PUBLIC TRANSPORTATION and TRANSPORTATION DISADVANTAGED MODAL PLAN

Introduction

During the next 20 years, public transportation will play a critical role in linking activity centers and improving access within them. A complete transit system includes light rail, buses, streetcars, vanpools, dial-a-ride service, potentially water taxis, and limited park-and-ride facilities to serve the entire population, including the transportation disadvantaged.



Tri-Met is the primary transit provider for the region. Tri-Met implements transit improvements through annual updates and expansions to its service plan. Annual growth trends, ridership and traffic congestion are considered when making changes to transit service. The addition of new light rail lines and streetcar service results in adjustments to bus service to maintain and improve coverage and transfers.

Portland has in the past and will continue to have a large role in the development of an effective transit system. The city actively promotes transit to the community, advocates for better transit service to Tri-Met, develops transit-supportive infrastructure, implements transit-preferential measures, and facilitates and helps fund the development of streetcar lines, river taxi stops, and light rail.

The Transportation System Plan's (TSP) public transit policy supports a transit system that serves City residents and workers 24 hours a day, seven days a week. The City believes that light rail is the foundation for the transit system, linking the Central City to regional centers and major destinations such as the airport. Streetcars serve Portland neighborhoods, employment centers, shopping, educational institutions, and recreation destinations on both sides of the Willamette River. Buses provide the principal means of transit for access and mobility needs for the City, helping to relieve congestion and support economic activities.

Requirements

Transportation Planning Rule

In addition to the common elements that must be included in each of the modal plans (as described in the introduction to this chapter, the state Transportation Planning Rule (TPR) contains the following elements specific to public transportation:

- A description of public transportation services for the transportation disadvantaged and identification of service inadequacies (special transit services)

- A description of intercity bus and passenger rail service and identification of terminals

- Identification of existing and planned transit trunk routes, exclusive transit ways, transfer stations, major transit stops and stop location standards, and park-and-ride stations

- Planned service capacity

2000 Regional Transportation Plan Requirements

Metro's role in public transportation is to establish a 20-year plan for regional transit improvements, such as major bus or rail service, through the 2000 Regional Transportation Plan (RTP). Metro's goal is to ensure adequate provision of transit services in the region to implement Region 2040. Metro focuses on the higher levels of transit service and coordinates with Tri-Met on community-level transit service, such as local bus lines or lift services. The RTP identifies a regional transit network that serves the primary land use components, including the Central City, regional centers, industrial areas and intermodal facilities such the Portland International Airport. Because of this focus, the RTP classification system for public transportation varies somewhat from Portland's classifications, as shown on Table 5.6.

Portland must be consistent with the public transportation policies contained in the RTP:

- RTP Policy 14.0 focuses on providing an appropriate level, quality, and range of public transportation options to serve the region and support implementation of the 2040 Growth Concept.

- RTP Policy 14.1 calls for increasing the information available about public transportation to allow more people to use the system.

- RTP Policy 14.2 focuses on efforts to make public transportation an environmentally friendly and safe form of transportation.

- RTP Policy 14.3 identifies performance measures to ensure that transit service is fast, reliable, and competitive in travel times to the automobile.

Section 6.4.10 of the RTP lists a number of measures that local jurisdictions are required to comply with. Jurisdictions must adopt a transit system map, consistent with the transit functional classifications in the RTP. Portland has not identified any discrepancies between the RTP public transportation modal map and its own designations, with one exception, as described below.

Table 5.6
Comparison of Transit Classifications

RTP Classification	TSP Classification
Light Rail Transit	Regional Transitway/ Major Transit Priority Street
Intercity High-speed Rail	Intercity Passenger Rail
Rapid Bus	Regional Transitway/ Major Transit Priority Street
Street Car	Major Transit Priority Street/Transit Access Street
Frequent Bus	Major Transit Priority Street/Transit Access Street
Regional Bus	Transit Access Street
Community Bus (not mapped)	Community Transit Street
Transit Center, LRT Station Major Transit Stop	Transit Station Not mapped
Intercity Bus Passenger Terminal Intercity Rail Passenger Terminal Intercity Air Passenger Terminal	Passenger Intermodal Facilities

Metro identifies major transit stops throughout the region, where specific regulations must be adopted relating to orientation and location of buildings adjacent to these stops. Effective January 1, 1997, Portland adopted regulations into its Zoning Code that implement more stringent requirements than both the RTP and TPR. In Portland, building setbacks and orientation are required along the entire length of designated transit streets, rather than at major transit stops only. Portland's regulations recognize that stop spacing is relatively close (and subject to change) and that the regulations also apply to many designated pedestrian districts. Portland believes the resulting urban design will respond better to the pedestrian by eliminating 'gaps' where buildings can be set back from the street. Chapter 6, Implementation Strategies and Regulations, of this document summarizes the Portland regulations that respond to these RTP requirements.

Other requirements of Section 6.4.10 of the RTP are:

1) Provide direct and logical pedestrian crossing at transit stops and marked crossings at major transit stops.

2) Consider street designs that anticipate planned transit stop spacing, location, and facilities and are consistent with the Creating Livable Streets design guidelines.

Portland's Pedestrian Design Guide establishes minimum and maximum distances between crossing opportunities. Generally, crossings should be no more than 400 feet apart and may be more frequent in pedestrian districts and along main streets. The Pedestrian Design Guide also identifies where marked crossings are appropriate. The TSP contains a policy that references the Creating Livable Streets design guidelines for regional street design purposes. (See Chapter 2, Transportation Element, for the complete text of Objective 11.10E.)

Approach to Mode

The City's approach to transit services and facilities for the next 20 years is embodied in the following objectives:

- Continue to support transit as the preferred mode for person trips to and from the Central City, regional and town centers, and light rail stations.
- Continue to recognize light rail transit as the backbone of the regional transit system. Completing this system to connect all regional centers should be a high priority for the region.
- Address City travel needs through primary and secondary bus services (as defined by Metro).
- Expand primary and secondary bus services to ensure that access and mobility needs are served, traffic congestion is reduced, and the City's economy is supported.
- Give high priority to increased frequency and reduced travel times, particularly on major routes.
- Support transit that meets the needs of the transportation disadvantaged.
- In lower-density areas, consider other forms of transit, including vanpools and dial-a-ride.
- Support the development of commuter rail services to address the growing travel demands from communities outside the Portland metropolitan area. Commuter rail service should serve the Union Station transportation center, link to all modes of passenger travel, and support regional growth management strategies.
- Support transit enhancements to employment and industrial areas.

Policy Framework

City of Portland Comprehensive Plan

The Portland's Comprehensive Plan contains statements that guide how the City plans and implements improvements. In addition, a number of district and neighborhood plans have been adopted that contain more area-specific statements. These statements are ordered from the general to the specific as goals, policies, and objectives. Goals, policies, and objectives are formally adopted by City Council ordinance.

Goal 6 Transportation
Policies and objectives within Goal 6 that relate to public transportation are primarily under Policy 6.25, Public Transit, which states:

> Develop a transit system that conveniently serves city residents and workers 24-hours a day, seven days a week and can become the preferred form of travel to major destinations, including the Central City, regional and town centers, main streets, and station communities.

The objectives for Policy 6.24 address:

A. Supporting light rail and bus connections as the foundation of the regional transit system

B. Basing light rail alignment decisions on individual corridor studies

C. Expanding primary and secondary bus routes to meet the demand for work and non-work trips and support economic vitality

D. Implementing transit-priority measures on Major Transit Priority Streets

E. Considering alternative forms of transit

F. Supporting a public transit system and regional transportation strategies that address the needs of the transportation disadvantaged and provide increased mobility options and access

G. Locating park-and-ride lots only where they will significantly increase transit use and not hamper transit-supportive development

H. Developing streetcar lines to connect residential areas to employment opportunities and other destinations

(The complete text is contained in Chapter 2.)

Policy 6.6, Transit Street Classification Descriptions, describes the eight types of transit streets and facilities. The purpose of the transit classifications is to describe the hierarchy of transit streets that support "the movement of transit vehicles for regional, interregional, interdistrict, and local trips." In addition to transit streets, the classifications describe the desired character of transit stations, intercity passenger rail lines, and passenger intermodal facilities. There are eight maps that show the transit classifications. They are located with the policy associated with each of the eight transportation districts. This policy states:

> Maintain a system of transit streets that supports the movement of transit vehicles for regional, interregional, interdistrict, and local trips.

The objectives address each of the transit classifications. The previous Transportation Element and Central City Transportation Management Plan classifications have been consolidated and new classifications added to be consistent with the 2000 RTP. The classifications describe the appropriate adjacent land uses, level of transit stop improvements, stop spacing, and access to transit.

- Regional Transitways serve interregional and interdistrict transit trips with frequent, high-speed, high-capacity, express, or limited service, and connect the Central City with regional centers.

- Major Transit Priority Streets provide high-quality transit service that connects the Central City with regional and town centers and main streets.

- Transit Access Streets provide district-oriented transit service serving main streets, neighborhoods, and commercial, industrial, and employment areas.

- Community Transit Streets provide local service in neighborhoods and industrial areas and connect to city-wide transit service.

- Local Service Transit Streets provide transit service to residents and adjacent commercial areas. Typically, Local Service Transit Streets seldom have regular transit service except for short street segments.

- Transit Stations are stops for light rail vehicles or other high-capacity transit service.

- Intercity Passenger Rail are heavy rail lines that provide commuter and other rail passenger service.

- Passenger Intermodal Facilites serve as the hub for various passenger modes and the transfer point between modes. Examples are Union Station and the airport.

Policy 6.19, Transit-Oriented Development, is directed to the relationship between land use and transportation. It states:

> Reinforce the link between transit and land use by supporting increased residential employment densities and encouraging transit-oriented development along transit streets, at existing and planned light rail transit stations, and at other major activity centers.

Its objectives address:

A. Considering the existing or planned availability of high-quality transit service in adopting more intensive zoning

B. Focusing medium-density and high-density development in transit-oriented developments along transit lines

C. Requiring commercial and multifamily development to orient to and provide connections to transit streets.

Policy 6.32, Multimodal Passenger Service, addresses the planning, development, and interconnection of Portland's, the region's and intercity transportation services for passenger travel. It's objectives cover:

A. Continuation of Union Station as the multimodal transportation hub serving passenger rail and intercity bus travel.

B. Recognizing the airport as the hub air passenger facility with connections to light rail.

C. Support for new passenger transfer facilities in existing and emerging regional centers.

D. Support for commuter rail service where it will support the 2040 Growth Concept.

E. Support for expansion of passenger rail service between Eugene, Portland, Seattle, and Vancouver, B. C.

In addition to these policies and objectives, other transit-related objectives under Goal 6 are:

- Direct interregional traffic to use Regional Trafficways and Regional Transitways, and manage these facilities to maximize their existing capacity. (Policy 6.12, Regional and City Travel Patterns, Objective A)

- Employ transportation system management measures, including coordinating and synchronizing signals, to improve traffic and transit movements and safety for all modes of travel. (Policy 6.15, Transportation System Management, Objective B)

DISTRICT TRANSIT-RELATED OBJECTIVES

District-specific objectives addressing transit improvements are contained in Policy 6.34 through Policy 6.40 for seven of the eight transportation districts: North, Northeast, Far Northeast, Southeast, Far Southeast, Northwest, and Southwest. Central City objectives are summarized later in the policy analysis. Selected objectives are listed below; the complete text of district policies and objectives is provided in Chapter 2.

North:

- Support improvements to transit service that will link North Portland to areas outside the downtown. (Policy 6.34, Objective F)

- Develop light rail on N Interstate and to the Expo Center, while mitigating for potential diversion of traffic onto local streets. (Policy 6.34, Objective H)

Northeast:

- Improve transit service and facilities where needed to serve employment areas, including the Columbia Corridor, Northwest industrial area, and developing residential areas. (Policy 6.35, Objective E)

- Work with Tri-Met and businesses to encourage the use of alternatives to automobiles, especially in Columbia Corridor. (Policy 6.35, Objective F)

Far Northeast:

- Improve cross-town transit service to accommodate trips within the Far Northeast District, transit service along Sandy, and transit connections to light rail. (Policy 6.36, Objective B)

- Resolve the long-term future of the park-and-ride at Gateway. (Policy 6.36, Objective E)

Southeast:

- Continue to improve cross-town transit service, transit travel times, and expand off-peak and weekend service. (Policy 6.37, Objective I)

- Support planning for and development of light rail transit and streetcars in Southeast Portland, including consideration of feeder transit service and pedestrian and bicycle access. (Policy 6.37, Objective J)

Far Southeast:

- Reduce travel demand in the district by providing additional transit service, including feeder service to light rail and alternatives to buses for low-density areas. (Policy 6.38, Objective D)

Northwest:

- Expand transit service throughout the district, including adding more cross-town service, connecting bus service from the Civic Stadium light rail station to the northwest industrial area, and improving service in low-density areas such as Linnton. (Policy 6.39, Objective A)

Southwest:

- Use the Willamette Shore Line right-of-way, the corridor identified in the Macadam Corridor Improvement Plan, or other alignment as appropriate to provide future streetcar commuter service or light rail in the Macadam corridor. (Policy 6.40, Objective A)

Goal 11 Public Rights-of-Way

Goal 11B, Public Rights-of-Way, and its policies and objectives describe how the City's transportation system should be designed and built. Transit-related objectives under Goal 11B include:

- Promote a compact urban form by supporting development in high-priority 2040 Growth Concept areas, including facilities and improvements that support mixed-use, pedestrian-friendly development and increase walking, bicycling, and transit use. (Policy 11.9, Project Selection, Objective A)

- Include improvements that enhance transit operations, safety, and travel times in projects on existing or planned transit routes. (Policy 11.10, Street Design and Rights-of-Way Improvements, Objective H)

- Ensure that transportation facilities are accessible to all people and that all improvements to the transportation system (traffic, transit, bicycle, and pedestrian) comply with the Americans with Disabilities Act. (Policy 11.10, Objective K)

Central City Transportation Management Plan

The CCTMP was adopted in December 1995 to implement the Central City Plan for transportation. Policy 4 of the Central City Plan states:

> Improve the Central City's accessibility to the rest of the region and its ability to accommodate growth, by extending the light rail system and by maintaining and improving other forms of transit and the street and highways system while preserving and enhancing the City's livability.

The CCTMP expanded on this policy with a set of policies that address various aspects of transportation in the Central City.

Policy 2.3, Priority for Transit, states:

> Support transit as the preferred mode of moving people to increase transportation access to the Central City, with light rail and express bus routes providing the link to urban and suburban centers and urban transit routes connecting close-in City neighborhoods.

Under Policy 3, Mode Split, sub-policy 3.1, Transit, establishes the following transit mode split goals for commuter trips in 2010 for the districts of the Central City:

Downtown	60%
North of Burnside	40%
Lloyd-Coliseum	40%
Northwest Triangle	20%
South Waterfront	20%
Goose Hollow	20%
Central Eastside	15%
Lower Albina	10%

Policy 5, Transit, and its sub-policies state:

> Ensure that the transit system will be a key component in stimulating economic development in the Central City, supporting the density and diversity of activities that lead to high levels of pedestrian and bicycle trips, minimizing automobile congestion, and improving air quality. (Policy 5)
>
> Improve transit access to the Central City to support its full development potential as envisioned in the Central City Plan. (Policy 5.1, Transit Access)

> Increase the speed and reliability of transit service in the Central City. (Policy 5.2, Transit Operations)
>
> Improve the understandability, predictability, and visibility of transit in the Central City. (Policy 5.3, Physical Image of Transit)
>
> Improve transit service to provide better circulation and distribution within and between districts of the Central City. (Policy 5.4, Central City Transit Circulation)
>
> Use transit to foster high-density, transit-supportive development. (Policy 5.5 Transit-Supportive Development)
>
> Participate in regional efforts to secure funding for improved transit services, facilities, and demand management programs. (Policy 5.6 Funding Transit)

The complete text of the policies and their supporting objectives is contained in Chapter 2 of the TSP.

Other Transit-Related Policies and Objectives

In addition to the Transportation Element, the following Comprehensive Plan objectives mention transit and the link between transit and land use.

Goal 2, Urban Development, Objective 2.1, Transit Corridors states:

> Provide a mixture of activities along major transit routes and Main Streets to support the use of transit. Encourage development of commercial uses and allow labor-intensive industrial activities that are compatible with the surrounding area. Increase residential densities on residentially-zoned lands within one-quarter mile of existing and planned transit routes to transit-supportive levels. Require development along transit routes to relate to the transit line and pedestrians and to provide on-site pedestrian connections.

Goal 2, Urban Development, Objective 2.17, Transit Stations and Transit Centers, states:

> Encourage transit-oriented development patterns at light rail transit stations and at transit centers to provide for easy access to transit service. Establish minimum residential densities on residentially-zoned lands within one-half mile of light rail transit stations and one-quarter mile of transit centers that support the use of transit. The design and mix of land uses surrounding light rail transit stations and transit centers should emphasize a pedestrian- and bicycle-oriented environment and support transit use.

Goal 4, Housing, Objectives 4.3 A and 4.3C, Sustainable Housing, state, respectively:

> Place new residential developments at locations that increase potential ridership on the regional transit system and support the Central City as the region's employment and cultural center.

> Encourage the development of housing at transit-supportive densities near transit streets, especially where parks or schools are present, to ensure that the benefits of the public's investment in those facilities are available to as many households as possible.

Goal 5, Economic Development, Objectives 5.4C and 5.4D, Transportation System, state, respectively:

> Work closely with public agencies, such as Tri-Met, and the private sector to deliver an efficient and effective transportation system and network. Improve transit connections between residential communities and work sites.
>
> Support transit-supportive development and redevelopment along designated transit streets and in the vicinity of light rail stations.

Goal 5, Economic Development, Objective 5.7E, Business Environment Within Designated Commercial Areas, states:

> Concentrate the expansion of commercial and mixed use activities near the intersections of Major City Traffic or Transit Streets as designated by the Transportation Element, and near Major Transit streets.

Goal 7, Energy, Objective 7.4C, Energy Efficiency through Land Use Regulations, states:

> Promote medium to high-density residential near proposed transit stations and medium-density residential development along major transit routes.

Goal 7, Energy, Objective 7.6, Energy Efficient Transportation, and 7.6C and E state, respectively:

> Provide opportunities for non-auto transportation including alternative vehicles, buses, light rail, bikeways, and walkways. The City shall promote the reduction of gasoline and diesel use by conventional buses, autos and trucks by increasing fuel efficiency and by promoting the use of alternative fuels.
>
> Support efforts to ensure the energy efficiency of the transit system, including good street maintenance and transportation system management.
>
> Promote the construction of a regional light rail transit system.

Existing Conditions

Summary of TSP Inventory

Regular Transit Service

The status of public transit in the region was most recently described in the TSP Inventory (1996). At that time, Tri-Met was operating 90 bus routes and eastside light rail, with a total fleet of 644 vehicles, including 25 mini-buses. This service consisted of 5 trunk lines, including eastside MAX, 22 city radial lines, 6 crosstown lines, 38 radial/feeder lines, and 20 peak radial/feeder lines. Since then, the westside light rail line has opened, and Tri-Met's

fleet now consists of 736 vehicles, including 664 buses and 72 light rail vehicles. Five transit centers are located within the City of Portland, and bus stops are located generally at two- to three-block intervals along each route. There are 18 park-and-ride lots within the City, providing approximately 2,380 parking spaces.

Route frequencies are based on the average load factor and time of day. Tri-Met routes have an average load factor of 0.47. Refer to the TSP Inventory (1996) for a map of routes with 20-minute or more frequent peak-hour service (Figure 14) and the following tables:

- Transit Frequency Table (Appendix D)
- Average Weekday Boarding Rides (Fiscal Year 1987 to 1995) and Average Daily Boarding Rides (Appendix E)
- Average Load Factor for All Routes (Weekdays) and Average Load Factors – September 3rd to December 2nd 1995 (Weekdays) (Appendix F)

Special Transit Services

Tri-Met's LIFT Program provides door-to-door rides to registered customers who are unable to use Tri-Met's regular service due to physical or mental disabilities. The program was operating 100 small, lift-equipped buses in the tri-county area at the time of the 1996 TSP Inventory. Service is provided from 4:30 am to 2:30 am, seven days a week (the same hours as regular Tri-Met bus and MAX service), to origins and destinations within three-quarters of a mile from a regular Tri-Met route.

Ride Connection is a coordinated transportation delivery system composed of community transportation providers throughout the Portland metropolitan area. These programs focus on service to the elderly and individuals with disabilities with no other viable transportation alternatives. Ride Connection relies on volunteers. Customers are not required to pay a fare, but donations are accepted. Volunteer drivers and escorts drive VTI lift-equipped mini-vans and mini-buses or their personal vehicles.

Tri-Met also provides Special Events Transit Service (SETS) to accommodate transit needs during special events. In most cases, the event sponsor requests the service. For examples of SETS, refer to the TSP Inventory (1996), Appendix G: Tri-Met Special Events Transit Service (SETS) '95.

Intercity Bus and Rail

Portland's Greyhound terminal, located next to Union Station, provides bus service to cities and towns throughout the United States.

Amtrak provides rail service for the Pacific Northwest Corridor. Portland is served by a total of five trains: four provide daily service between Vancouver, British Columbia and Eugene, Oregon, and one provides limited service between Seattle, Washington and Eugene. Two of those trains also run from Portland to Chicago, Illinois.

Recent Major Improvements

Light Rail Transit

AIRPORT MAX
Service on the new MAX light rail extension (Airport MAX) to the Portland International Airport (PDX) began September 2001. The extension is 5.5 miles and runs along I-205 between the Gateway Transit Center and PDX. It serves Cascade Station, an emerging 120-acre transit-oriented project along the light rail corridor. When complete, Cascade Station will feature hospitality, retail, entertainment, and office space and will be served by two MAX stations. The MAX 'red line' travels to the airport starting at approximately 3:30 A.M. and ending service at approximately 12:30 A.M. with 15-minute headways throughout the day and night.

Airport MAX is intended to provide airline passengers and employees with an important transportation link to the airport and Cascade Station. It will also improve transit service for the Columbia Corridor, a growing economic center.

INTERSTATE MAX
After voters rejected funding the South/North light rail project in 1998, residents of north and northeast Portland requested that Tri-Met, the City of Portland, and Metro consider building a light rail extension in north Portland. Tri-Met cites six key reasons for originally considering the Interstate MAX light rail:

- Provides another transportation option to help meet the growing demand in the I-5/ Interstate Avenue corridor.

- Provides additional transit service in the area that is dependable and expands the regional transportation system, linking jobs throughout the Portland metro area.

- Provides the opportunity to revitalize Interstate Avenue with employment, housing, and retail.

- Takes cars off the roads; reduces air pollution and related illnesses.

- Gives Vancouver commuters an alternative to driving through north Portland on I-5 by providing a potential park-and-ride lot at the Metro Expo Center. Shuttle bus service from Clark County may also serve the Expo Center. Interstate MAX also provides the opportunity to expand to Clark County in the future if Washington residents approve funding for the extension.

- Federal funds originally designated for Portland may still be available to help build the north extension.

Interstate MAX is under construction between the Rose Quarter and the Expo Center; operation will begin in 2004.

Central City Streetcar

The Central City streetcar connects the dense northwest Portland shopping district and Good Samaritan Hospital, along with the surrounding residential neighborhoods, to the Central City and Portland State University. After nearly a decade of study, a streetcar was determined to be the most appropriate choice for providing convenient access to and from the northwest district, where parking shortages and traffic congestion have become a serious problem.

The streetcar is the City's first step in extending the same quality service available on MAX into the Central City and its surrounding neighborhoods. The streetcar follows a five-mile route with stops every two to three blocks. The streetcar is largely fareless, the exception being north of Hoyt. The $33 million project was funded through a creative mix of federal grant monies, bonds on public parking facilities, and a local improvement district. Currently the streetcar is averaging 6,000 to 7,000 daily riders.

As more communities—such as North Macadam— emerge as residential, employment, or retail hubs, new connections should be added to these areas to support development, meet growing demands for transit, and discourage automobile use.

Existing Deficiencies

Issues from District Needs Assessment

In fall 1998, the Portland Office of Transportation (PDOT) held TSP workshops in each of the Transportation Districts to gather information about transportation issues and community needs. Participants were asked to identify needed transportation improvements in their neighborhood and indicate their top three priority issues, or 'transportation values.'

One of the top seven values identified in the workshops was to significantly increase transit services. This value was especially important in the Northwest, Southwest, Southeast, and Far Southeast Districts. Other values related to transit were to manage congestion and provide choices. Managing congestion was especially important in Northwest, Northeast, Far Northeast, and Far Southeast. Providing more transportation choices was one of the top priorities in Southeast.

Transit Choices for Livability

In 1998, Tri-Met completed a regional process for soliciting input on future transit priorities, called Transit Choices for Livability. The intent was to ask the community where and what kinds of service were desired, but not currently being provided. The result was a Transit Livability Strategy containing a series of sketch plans with identified transit service priorities, funding recommendations, and service delivery recommendations.

The highlights of recommended new or improved service for Portland were:

- Improved service to employment areas in the Columbia Corridor and NE Airport Way, and ultimately airport MAX service (better connections between housing and jobs in the Columbia Corridor)
- Improvements in existing bus service for NE Glisan and SE Market/Main
- Better service between Gateway and Clackamas town center
- Rapid bus service on SE McLoughlin, connecting to the South/North transit corridor
- Shuttle service to Swan Island and the Rose Quarter
- Improved service in southwest Portland along SW 35th, SW Stephenson, SW Boones Ferry, and other underserved areas
- New rapid bus service along SE Division from Portland to Gresham
- New connection between Civic Stadium and the northwest industrial area, with a link to north and northeast Portland
- New connections between Forest Heights and light rail
- Improved service on existing lines serving SW Taylors Ferry, SW Garden Home, Raleigh Hills town center, NE 33rd, SE Holgate, NE Glisan, NE Broadway, and Hollywood town center
- All-night service on selected routes
- Extension of Fareless Square to the Lloyd District
- New streetcar service between Good Samaritan Hospital and Portland State University
- Better service to the Lloyd District, with better connections to other Central City locations
- Improved connections between downtown Portland and the Central Eastside industrial area
- More buses connecting to the Portland State University transit center
- Extended service on SW Jefferson and SW Columbia to connect Goose Hollow to SW Naito Parkway
- Connection of the North Macadam hub area and Oregon Health Sciences University via the Portland State University transit center
- Better north-south service on the east side of the Willamette River

Tri-Met Three-Year Service Proposal

As part of the longer-term strategy outlined in the Transit Choices for Livability, Tri-Met developed a three-year plan that proposes adjustments to routes and schedules. With additional federal funds available for transit, Tri-Met now has the opportunity to make significant improvements aimed at substantial and sustained increases in ridership. The plan addresses five overall action items:

- Develop transit corridors.
- Add service to high-ridership lines.
- Improve service quality.
- Increase efficiency with new technology.
- Reallocate service on lowest ridership lines.

Specific improvements proposed for the Portland area include:

- Improve weekday, midday, and night service to North Portland (lines 1-Greeley and 40-Mocks Crest); weekday service to Southeast (line 10-Harold); weekend service to

Southeast (lines 9-Powell, 10-Harold, 17-Holgate and 19-Woodstock); and weekday and weekend service to Northeast (line 10-NE 33rd).

- Improve service to North, Northeast, and Southeast along Killingsworth and 82nd Avenue to Clackamas Town Center regional center (line 72-Killingsworth-82nd).

- Extend Fareless Square to the Lloyd District, in partnership with the Lloyd District Transportation Management Association and City of Portland.

- Develop partnership plans that coordinate public and private investments to address development, parking, and alternative transportation needs in the River District and North Macadam areas.

- Consider reconfiguring service to connect with the Central City streetcar project.

Tri-Met Five-Year Plan

Tri-Met is in the formative stages of developing a five-year plan for transit service. This plan will guide service and capital investments for annual service planning. Relevant portions of the plan, when completed, will be incorporated into the next TSP update.

Underserved Areas and Populations

This section outlines the segments of the transit network that are in great need of service improvements, based on the 1996 inventory. The service frequency at which a particular line should operate, according to adopted standards, is referred to as a 'policy-headway'. Policy-headways are not rigid standards; service should not necessarily operate at a policy-headway if the service does not meet effectiveness standards or is not projected to do so. The following lines are operating below the policy-headway during two or more *weekday* time periods, also identified below. Periods are defined as peak (7-9 am and 4-6 pm), base (6-7 am and 9 am-4 pm), evening (6-9:30 pm) and night (9:30 pm-midnight).

TRUNK LINES

• Barbur Blvd, #12	Evening, Night
• McLoughlin, #33	All time periods

CITY RADIAL LINES

• Greeley, #1	Peak, Base
• NE 33rd Ave, #10	Base, Night
• Harold, #10	Base, Evening, Night
• Tacoma, #40	Peak, Base
• Mocks Crest, #40	Peak, Base, Night

RADIAL/FEEDER LINE

• San Rafael-182nd, #23	Base, Evening
• Glisan-Rockwood, #25	Base, Evening
• Market-Main, #27	Base, Evening
• Linwood, #28	Base, Evening
• Lake-Webster, #29	Base, Evening
• River Road, #34	Base, Evening

- South Shore, #36 Base, Evening
- North Shore, #37 Base, Evening
- Taylors Ferry Rd, #43 Base, Evening
- Washington Park-OMSI, #63 Peak, Base, Evening
- Canby-Clackamas TC, #79 Peak, Base, Evening
- Gresham-257th, #81 Peak, Base Evening
- Sandy/Boring, #84 Peak, Base, Evening
- Willamette, #154 Base, Evening

An area is considered to be a 'major underserved area' if it includes one or more of Metro's regional traffic zones in which less than 25 percent of the population is within one-quarter mile of existing transit service. The major underserved areas in Portland identified in the 1996 TSP inventory were:

- Arnold/Stephenson
- Front Avenue
- Hart/Bany
- Johnson Creek/92nd

Since the inventory, weekday peak-hour service has been instituted on Front Avenue, between St. Johns and the Central City.

Recent Transit Studies and Plans

Barbur Corridor Light Rail Transit Study

In 1991, the City completed a study of the Barbur Corridor's potential for light rail (Barbur Corridor Light Rail Study). The study evaluated light rail options, based on criteria such as travel times, ridership, costs, traffic and environmental impacts, displacements, and the economic development potential at stations. The study concluded that the Barbur Corridor is "a viable corridor for further study of Light Rail Transit."

The travel demand analysis identified a potential ridership for light rail transit with a supporting feeder bus network. While definitive ridership numbers and impacts were not determined, analysis indicated that "implementation would result in a notable increase in transit ridership. Furthermore, there is a demand for additional people-carrying capacity in the corridor, and limited space in which to provide that capacity."

Transit Preferential Streets

The 1992 Transportation Element (TE) of the City of Portland Comprehensive Plan recommended implementing a Transit Preferential Street Program. The problem statement in the TE was:

> Increased transit demand and on-street congestion have increased travel times in the Central City area. Increased travel times result in one-half percent increase each year in transit operating costs. The current solution to this problem is to add buses on routes that experience increased traffic congestion and/or ridership. This remedy also results in additional service delays by increasing congestion.

The program objectives would be to improve transit travel times, both overall and in relation to auto travel times; reduce vehicle miles traveled per capita; and place emphasis on the transportation of people, not vehicles.

In 1997, PDOT issued the Transit Preferential Streets Program report. The report identified potential tools for improving transit travel times, selected a number of transit corridors for analysis of transit preferential strategies, and designed improvements for those corridors. In addition, the report recommended that transit priority measures should be considered on all major transit corridors to achieve competitive travel times and improve service reliability.

The report identified the following corridors as having the highest priority for transit preferential treatment, based on existing travel times, ridership, and delay factors:

- NE Martin Luther King, Jr. Boulevard (Hawthorne Bridge to North Lombard)
- NE Sandy Boulevard (Burnside Bridge to SE 82nd Avenue)
- SE Hawthorne Boulevard/Foster Road (Hawthorne Bridge to I-205)
- SE Division Street (Martin Luther King, Jr. Boulevard to SE 82nd)
- SW Beaverton-Hillsdale Highway/Barbur Boulevard (I-405 to Oleson Road)

Tri-Met and the City of Portland have received federal grant monies to implement transit preferential treatment. This project is called "Streamline." It targets high-ridership lines that have significant delays, and seeks to make operations more efficient, compatible with low-floor buses, and more attractive to riders. Under this program, three transit lines are being treated first:

- Line No. 4 – Division/Fessenden
- Line No. 72 – Killingsworth/82nd
- Line No. 12 – Sandy/Barbur

The primary project components are:

- Traffic signal changes, including signal priority, queue jump, queue bypass lanes, and signal timing changes
- Physical changes, including curb extension, low-floor buses, and right-turn only lane exemption
- Operational changes, including bus stop relocation and consolidation, reduction in route deviations, and on-street parking adjustments
- Passenger amenity enhancements

Implementation of the entire Streamline project will take several years. After the initial lines are completed, other routes (including Line No. 9 – Broadway/Powell and Line No. 14 – Hawthorne) will receive similar treatment.

Central City Transit Plan

In February 1997, the Portland City Council passed a resolution requesting that Tri-Met prepare a transit plan to address the phasing of light rail service and the overall circulation needs of the Central City, focusing especially on transit needs for the River District. The purpose of the resolution was to ensure that changes made to tie bus service into light rail would not reduce overall access to north downtown and the River District. A comprehensive bus circulation plan was also needed to address other proposed changes in transit service, such as South/North light rail, changes to westside bus service, and new streetcar service.

Tri-Met completed Phase I of the Central City Transit Plan (CCTP) in April 1998. The CCTP established the goals, objectives, and principles that will serve as a framework for short-range implementation and long-range planning of Tri-Met service in the Central City. The elements of the CCTP goal include:

- Improving passenger convenience
- Facilitating mobility
- Maximizing ridership
- Supporting land use and economic goals
- Increasing transit's modal share within Central City and the region

Phase II of the CCTP will address service improvements to each of the Central City Districts, integrate the CCTP into Tri-Met's Transit Choices for Livability Plan, and develop work plans for implementation.

Lloyd District Transit Strategy

The Lloyd District Transit Strategy is one part of the Partnership Plan developed by the Lloyd District Transportation Management Association (LDTMA), the City Of Portland, and Tri-Met. The Partnership Plan was created to provide an effective strategy for implementing the Central City Transportation Management Plan. Elements of the Partnership Plan include, but are not limited to, providing employer incentive programs that support parking meter installation and transit service improvements.

The Partnership Plan goals, objectives, performance standards, and measures reflect regional ridership goals and mode split targets, local transportation and parking requirements, and the transportation needs of Lloyd District employees. The plan goals include:

- Establish programs and services that meet diverse transportation needs, implement strategies of the CCTMP Lloyd District Plan, and result in reduced auto trips by employees in the LDTMA boundaries. The first targeted group will be Eco-rule employers.

- Ensure long-term funding of the LDTMA by creating plan policies that support the LDTMA , maximize resource availability, and minimize program and service cost to the employer.

- Support the LDTMA as the formal structure for an ongoing partnership between Tri-Met and the City of Portland to address the Lloyd District area transportation needs.

The Partnership Plan includes the following recommendations for increasing the transit mode split within the Lloyd District:

- Fixed Route Service Element. This involves potentially increasing three am/pm direct express routes to the district's business core. The service plan allocates 190 weekly service hours for the first year of implementation, in concert with sales of Tri-Met's employer PASSport program.

- Facility Improvements. This involves developing an on-street transit hub in the district's business core: NE 7th and Multnomah. This hub will contain some of the rider-friendly amenities of a transit center, without the layovers and staging functions associated with transit centers. The amenities will include relocation of bus shelters on Multnomah, trash receptacles, information kiosks, banners/gateway concepts, and an enlarged sidewalk area adjacent to future development.

- Other elements of the Partnership Plan that directly influence the use of transit or other non-auto modes within the Lloyd District include installing parking meters and implementing an aggressive marketing plan. The marketing plan is designed to increase awareness and encourage the use of alternative transportation options within the district. The primary components of the marketing plan are the PASSport program, emergence ride home, communications, and promotional activities.

North Macadam Transit Strategy

Policies from the North Macadam Framework Plan, Central City Plan, and Central City Transportation Management Plan form the basis for the North Macadam Transit Strategy. The North Macadam Framework Plan calls for development of 1,900 to 3,000 new housing units and 8,500 to 10,000 new jobs in the North Macadam District. Because the district is primarily served by two major traffic portals (Macadam and Bancroft) parking management, maximum use of transit, walking, bicycling, and ridesharing will be critical to support this development goal. Metro's 2020 strategic network transportation model was used to analyze travel demand in and out of North Macadam. The transit strategy is based on the forecasted travel demand and supported by the following service plan recommendations.

- With the SW Bond Avenue improvements, implement Macadam Avenue regional rapid bus service linking North Macadam with Lake Oswego and West Linn and the 5th and 6th Avenue transit mall in downtown Portland.

- Provide one or more bus routes to link North Macadam with Milwaukie and Clackamas County.

- Pursue South/North Light Rail to Clackamas County as part of the 20-year strategy.

- Implement the Central City streetcar to link North Macadam with Portland State University, the west end area, the River District, and northwest Portland.

- Provide direct bus linkage between southeast Portland, North Macadam, Lloyd District, and Central Eastside.

- Add a future bus connection from downtown to North Macadam to provide a connection between the eastern edge of downtown Portland and the River District area.

- Preserve future high-capacity rail options for the Jefferson Street line.

- Provide additional southwest bus connections to North Macadam by rerouting two or more southwest Portland bus lines to directly serve North Macadam.

Capitol improvements should include:

- Develop a transit hub in the North Macadam area and transit-preferential improvements at key intersections, including Bancroft/Macadam.

Partnership efforts are needed among the City of Portland, Tri-Met, property owners, and businesses to maximize the ridership potential in North Macadam. The following recommendations support transit and facilitate partnership formation:

- Create partnerships with Tri-Met, North Macadam businesses, and property owners to develop a transportation management association.

- Develop a partnership plan for supporting the use of alternative transportation modes, including an adopted service plan, transit pass programs, and a parking management plan.

Tri-County Elderly and Disabled Transportation Plan

The Tri-County Elderly and Disabled Transportation Plan was completed in June 2001. The plan identified a number of ways in which the existing services for the elderly and disabled populations could be improved. There were approximately 115,700 elderly (60 and over) and disabled (mobility limitation and/or self-care limitation) within Multnomah County in 1999. In the tri-county area, about 75 percent of the elderly and disabled populations live within a quarter mile of a fixed-route transit line. About 50 percent live within areas with a pedestrian-friendly environment (easy access to transit). About 37 percent of the elderly and disabled populations had difficulty finding transportation for some or all of their trips.

The five areas that need improvement that were identified in the plan are:

- There is no regional authority responsible for a tri-county elderly and disabled transportation system.
- Tri-county service delivery is not well planned, and service outside the public transit providers' district is limited.
- Elderly and disabled service standards vary from provider to provider.

- Elderly and disabled transportation planning is not well integrated with social service plans, local or regional transportation system plans, or local or regional land use planning.
- Needs exceed available resources for elderly and disabled service delivery.

As part of the study, key principles were developed and based on these principles three service-delivery strategies were developed. The recommended strategy focuses on a 'land use concept'. The concept is based on providing the highest level of service to the area where the highest concentration of elderly and people with disabilities are located. The plan recommends a number of pedestrian network improvements and land use and design measures that will enhance access for the elderly and disabled. The 'land use concept' covers the following:

1. Elderly and disabled transit-supportive development

   - Encourage the location of new elderly and disabled development along existing or planned transit corridors
   - Encourage a mix of uses for development projects that cater to the elderly and disabled community
   - Create pedestrian-oriented design

2. Pedestrian oriented planning with the elderly and disabled community in mind

   - Accessibility for compliance with Americans with Disabilities Act
   - Building orientation
   - Pedestrian crossings
   - Pedestrian-scale lighting and other amenities
   - Designation of transfer points within communities
   - Bicycle Access

3. Street Standard Planning with the elderly and disabled community in mind

   - Circulation networks that create walkable blocks
   - Street connectivity
   - Vehicle travel lanes to accommodate transit
   - Moderate or slow vehicle speeds
   - On-street parking to buffer pedestrians
   - Pedestrian medians on wide arterials

Many of the recommendations identified above are already adopted into the City's codes or are a part of street design standards. (See the implementation portion of this modal plan for details.)

Commuter Rail

Commuter rail is one of the wide-range of transportation modes that could be implemented to address transportation congestion within the south corridor – southeast Portland to

Clackamas County – and southwest part of the region. Typically, commuter rail provides a service link between an urban core, a central business district, and outlying suburban areas. Commuter rail service usually utilizes existing railroad rights-of-way. Passenger stations, park-and-ride lots, and train servicing facilities are added as needed.

Metro evaluated commuter rail during the South/North Transit Corridor Pre-Alternative Analysis in 1997. The study evaluated a 47.4-mile corridor between Canby, Oregon, and Ridgefield, Washington, using portions of the Burlington Northern and Southern Pacific Railroad rights-of-way. The study identified 12 potential stations, including Union Station, OMSI, Brooklyn Yard, Milwaukie, Clackamas, Oregon City, and Canby.

In May 1997, Metro published the Commuter Rail Final Report, which included the following conclusions:

- Commuter rail would not directly serve the main trip generators in the corridor.
- Distribution of trips in downtown Portland would be slow, with transfers required at either Union Station or a Hawthorne Bridge/OMSI station.
- Commuter rail would attract only five percent of the ridership projected for light rail in the same corridor.
- Commuter rail is unlikely to influence land use in the same manner as light rail, given potential station locations and the qualities that allow light rail to be integrated into a built environment.

Although implementation costs for commuter rail are less than for light rail, the cost-effectiveness of commuter rail in the south corridor is poor, given the ridership potential. Based on the technical findings and public involvement efforts, the South Corridor Policy Group decided in December 2000 to drop commuter rail from further consideration for this corridor.

Other potential commuter rail corridors identified in the 2000 Regional Transportation Plan would possibly link Sherwood, Beaverton, Wilsonville, Tualatin, Lake Oswego, and Milwaukie. A future Metro-led study of Interstate 5 between Highway 217 and Wilsonville will consider commuter rail service from Salem to Portland's Central City, the Tualatin transit center, and Milwaukie, primarily along existing heavy rail tracks. A future Metro study of Highway 217 will include coordination with planned commuter rail service from Wilsonville to the Beaverton regional center.

Implementation Measures

Existing Regulations

All new development, changes to existing development, and changes in the type or number of uses must comply with the zoning regulations in the City Code. Title 33, Planning and Zoning, has the most consequence for transit. These regulations are intended to implement the goals and policies of the Comprehensive Plan.

Title 33

Several new regulations were added to Title 33 in 1996 (effective date January 1, 1997) as part of the City's efforts to incorporate requirements of the state Transportation Planning Rule (TPR). The City went beyond the minimum requirements in some cases. For example, while the TPR requires new retail, office, and institutional buildings to be oriented to transit "at major transit stops," the City elected to require a wider range of development (including multifamily) in multifamily, commercial, and employment zones to be oriented to transit streets. A uniform setback is desirable in Portland, where transit stops are frequent along a transit route and there are many main streets and other commercial corridors. In addition, transit stops are sometimes moved, making it difficult to administer a regulation relating to transit stops. By not orienting to stops, it is not necessary to map 'major transit stops', as the TPR and RTP require local jurisdictions to do. The building orientation requirements also apply on all streets in pedestrian districts.

On large sites with over 100,000 square feet of retail uses, larger retail buildings can be placed further from the street if all the following conditions are met:

1. Smaller buildings are near the transit streets for at least 25 percent of the frontages

2. The internal circulation system for vehicles includes street-like features: sidewalks, curb extensions, and parking

3. The vehicle circulation system divides the parking into areas no more than 55,000 square feet in size

4. The internal 'streets' connect to adjacent transit streets

Other transit-related code amendments in 1996 include:

- Allowing a 'transit-supportive plaza' to be substituted for up to 10 percent of the number of required parking spaces. The design of the plaza must: 1) be adjacent to the transit street or stop, 2) be at least 300 feet square, 3) contain seating, 4) have at least 20 square feet covered, and 4) have between 10percent and 25 percent of the area landscaped.

- Restricting vehicle parking and maneuvering from being located between the main building and the transit street in most commercial zones.

- Requiring a main entrance and ground floor windows along the transit street.

- Requiring pedestrian connections between buildings and the adjacent street system.

Other Title 33 regulations that increase access to transit include connectivity standards for land divisions to create walkable blocks (adopted in 2001) with streets no more than 530 feet apart.

Portland Pedestrian Design Guide

The Portland Pedestrian Design Guide provides guidance for the development of sidewalks, street corners, crosswalks, and pathways and stairs. The Design Guide includes the appropriate location of elements in the sidewalk, including transit shelters in sidewalks and

of transit signs. The location of shelters and transit signs is based on an intergovernmental agreement *(Bus Stop and Passenger Amenities Guidelines, 1995*) between Tri-Met and Portland. The Pedestrian Design Guide is consistent with the requirements of the Americans with Disability Act, including allowed slopes, curb ramps, and clear space.

New Regulations

Title 33 is being revised as part of the TSP to better address building orientation along transit streets in pedestrian districts. To comply with the TPR, the City needs to be able to require "major industrial, institutional, retail and office developments to provide either a transit stop on site or connection to a transit stop" when Tri-Met requires such an improvement. The City already requires connections to streets adjacent to a site when it develops. The City can also require transit facilities and easements when a property is subject to a land use review such as a Comprehensive Plan Map amendment, zone change or conditional use.

Park-and-ride lots have been conditional uses in residential zones. Occasionally, Tri-Met would like to use existing religious institutions' parking lots as small park-and-ride lots. Limited use of existing parking lots will have little impact on residential areas and will increase transit use. The TSP will include Zoning Code changes to allow small amounts of existing parking in residential zones to be used as park-and-ride lots for public transit.

Amendments to Title 17 are also proposed to increase connectivity on large sites that are not being divided or subject to land use reviews such as shopping centers and institutions in commercial zones.

Projects

While Tri-Met is responsible for improvements in transit service and transit shelters, the City is responsible for the majority of changes that will improve access to transit. Many TSP projects over the next 20 years will include transit improvements (particularly improvements that will benefit pedestrians) and intelligent transportation system improvements that move transit vehicles more smoothly and efficiently.
Some of the most significant transit improvements on the TSP project list are briefly described below. (Chapter 3 provides the complete list and additional details.)

- Citywide transit signal priority projects, including 'opticom' preemption of signals (Project No. 10003)

- SW Multnomah street improvements between SW Barbur and 45th, including pedestrian crossings at bus stops (Project No. 90050)

- SE Foster Road street improvements between SE Powell and 82nd, including bus shelters and benches and pedestrian crossing improvements at bus stops (Project No. 70021)

- Parkrose area improvements, including sidewalks and pedestrian crossing improvements at bus stops (Project No. 50001)

- Extension of the Central City streetcar from SW Harrison into the North Macadam district (Project No. 20015)

- Improved sidewalks, lighting, crossings, bus shelters, and benches for the 60th, 82nd, 148th, and 162nd light rail station communities and intersecting streets (Project No. 10001)

- Hollywood town center multi-modal street improvements, including improved pedestrian crossings and connections to the transit center (Project No. 40045)

Programs and Strategies

Streamlined Bus Service

The City is working with Tri-Met to improve transit service in key corridors through the 'Streamline' program. The project includes making physical changes to the street – curb extensions, curb ramps, turning lanes – technological changes – preferential signal phases for transit – and stop improvements – shelters and customer information. The project is intended to improve access to transit and to improve transit travel times in the corridors. The first lines in the 'Streamline' program are No. 4 – Division/Fessenden, No. 72 – Killingsworth/82nd, and No. 12 – Sandy/Barbur. Other lines that will be added to the program as funds allow are No. 9 – Broadway/Powell and No. 14 Hawthorne/Foster in 2002.

Transportation Demand Management

Many of the activities described in the Transportation Demand Management Plan support the use of transit. Transportation management associations (TMAs) encourage employers to subsidize transit passes for their employees. Additional TMAs are in the formative stages and are identified in both the RTP and TSP – Gateway, Swan Island, and Columbia Corridor. The region is also allocating funds for a Northwest (exploratory stage) TMA.

Light Rail

Portland participates in regional transit projects, including light rail to the airport and light rail on N Interstate. On the Interstate line, Portland is managing a grant to identify improvements to the streets that intersect with light rail that will improve access to the light rail stations and support transit-oriented development.

Curb Ramp Program, Audible Signals, Truncated Domes

The City is retrofitting existing sidewalks to have curb ramps that comply with the Americans with Disabilities Act including adding 'truncated domes' at curb ramp edges so blind or low-sighted individuals can more easily detect where the street begins. Audible signals help blind or low-sighted individuals know when traffic signals change and the walk sign is on. Additional details for all three of these efforts in found in the Pedestrian Modal Plan.

Tri-Met Five-Year Plan

Tri-Met is in the formative stages of developing a five-year transit plan to guide service and capital improvements throughout the region.

Water Taxis

In 1991, the Office of Transportation Commissioned a report, River Access and Transportation (RAT), to describe a program to "unite the east and west banks of the Willamette River while maximizing the potential for economic benefit from recent public and private investments." The program is intended to implement a series of projects to increase access to and along the river and complement public and private sector initiatives such as the Oregon Convention Center and OMSI. Existing docks are at NW Ankeny, RiverPlace, and Willamette Park. Phase I and II of RAT resulted in the River Overlook near the Convention Center and the Eastbank Esplanade dock. The TSP Major Improvements List includes Phase III, a dock at Oaks Park. Other future dock locations identified in the report are NW 9th Avenue and OMSI. Other potential dock locations are Ports of Call, NW 27th, NW 19th, N Albina, SW Salmon, North Macadam, SW Whitaker, and Johns Landing. The report ultimately envisioned a fleet of water taxis with frequent headways.

Conclusion

While Portland is not a direct provider of public transportation services, it is responsible for many elements of the public transportation system. The City is responsible for ensuring that pedestrians and bicyclists have safe and convenient access to transit by providing sidewalks and bike lanes. Curb ramps help the elderly and disabled access the transit system more easily. The City also sponsors and participates in programs that encourage the use of transit. The Central City streetcar was developed through a consortium of public and private entities, including the City. Improved transit service and the transportation infrastructure to support it are key to implementing the 2040 Growth Concept and creating livable communities.

PEDESTRIAN MODAL PLAN

Introduction

Walking is the most affordable and accessible of all transportation modes. It is also clean, easy on the City's infrastructure, healthy for the individual, and integral to community livability. Portland has a history of creating a wonderful pedestrian scale, as can be seen in the Central City and older neighborhoods. Like most North American cities, however, Portland has its share of 'edge' communities developed around automobile transportation. In the last several decades, the City has annexed many neighborhoods where streets are not built with sidewalks, principally in Southwest Portland and mid-Multnomah County.

Various local studies have demonstrated a correlation between the quality of the pedestrian environment and the amount of walking activity. (These studies include the Land Use Transportation Air Quality (LUTRAQ) Project and household surveys conducted by Metro and the Portland Office of Transportation [PDOT] in 1994.) Residents in 'walkable' neighborhoods are very satisfied with the pedestrian safety and convenience these neighborhoods provide.

Today, the City of Portland is committed to providing the benefits of walking to all residents by supporting pedestrian travel as a safe, efficient, desirable, and accessible mode throughout the City's neighborhoods. Walking is no longer considered an 'alternative' to the automobile, rather, it is an essential component in efforts to develop a multimodal transportation system and reduce reliance on the automobile. Walking is considered the preferred, not the alternative, mode for short trips. State and regional policies also support this view, including Oregon's Transportation Planning Rule (TPR), the Urban Growth Management Functional Plan (UGMFP), and the 2000 Regional Transportation Plan (RTP).

Portland's 1998 Pedestrian Master Plan and Pedestrian Design Guide are the culmination of two years of work, including outreach and input from thousands of citizens. The Master Plan details the many elements that go into making Portland pedestrian friendly. It is the City's guiding document for pedestrian policies and projects. The Pedestrian Design Guide is the guiding document for designing pedestrian facilities. Any updates or changes to the guidelines go through a City-sponsored public process.

This pedestrian modal plan incorporates many elements of the 1998 Pedestrian Master Plan, but does not replace it. The Transportation System Plan (TSP) updates the Comprehensive Plan policies and objectives contained in the Pedestrian Master Plan and identifies a 20-year list of pedestrian projects taken from the Master Plan. The other elements of the Pedestrian Master Plan and Pedestrian Design Guide remain in effect as the guiding documents for improving pedestrian facilities and access in Portland.

Requirements

Transportation Planning Rule

In addition to the common elements that must be included in each of the modal plans (as described on page 5-2), the TPR includes the following element specific to pedestrians:

> Identify a network of pedestrian routes throughout the planning area and a list of facility improvements that are consistent with ORS 366.514, which requires that at least one percent of the funds received from the State Highway Fund each year be spent on footpaths (and bicycle trails) along highways, roads or streets and in parks and recreation areas.

In addition to the modal plan requirements, Section 660-012-045 of the TPR requires jurisdictions to adopt regulations that address the following:

> On-site facilities shall be provided which accommodate safe and convenient pedestrian and bicycle access from and within new subdivisions, multi-family developments, planned developments, shopping centers, and commercial districts to adjacent residential areas and transit stops, and to neighborhood activity centers within one-half mile of the development. Single-family residential developments shall generally include streets and accessways. Pedestrian circulation through parking lots should generally be provided in the form of accessways.

Section 660-012-045 also requires "convenient pedestrian and bicycle travel" as a condition of land use approval for any offsite road improvements.

2000 Regional Transportation Plan

The RTP includes three policies that specifically affect pedestrians:

- Policy 17.0 focuses on designing a regional pedestrian environment that is safe, direct, convenient, attractive, and accessible for all users.

- Policy 17.1 calls for increasing the pedestrian mode share through improved access to transit, improved pedestrian facilities, and land use and design.

- Policy 17.2 focuses on providing increased pedestrian access and connectivity to transit, appropriate and planned land uses, and pedestrian facilities as part of all transportation projects.

The RTP identifies a regional pedestrian system that provides mobility between, and easy accessibility within, the Central City, regional centers, and town centers. On-street and off-street regional pedestrian corridors, multi-use paths, and local pedestrianways form a complementary and continuous network. Portland's pedestrian network and classifications must be consistent with the RTP pedestrian system. Although the pedestrian classifications

in the RTP, TSP, and Central City Transportation Management Plan (CCTMP) differ somewhat, they are consistent with each other (see Table 5.6).

Table 5.7
Comparison of Pedestrian Classifications

2000 RTP	TSP Classification
Pedestrian District	Pedestrian District
Transit/Mixed Use Corridor	City Walkway, Transit/Pedestrian Street (Central City)
Multi-Use Facility with Pedestrian Transportation Function	Off-Street Path
Not mapped	Local Service Walkway

With three exceptions, the TSP classification maps contain all of the regionally designated pedestrianways. The first exception is an extension of the Willamette Greenway Trail in North Portland from its existing designation that ends south of the St. Johns Bridge to a connection with the existing designation on Swan Island. The extension would go through an area of north Portland that currently has industrial sanctuary zoning along most of it. The City is conducting a feasibility study for this extension. If the extension proves feasible, the TSP will be amended to add an Off-Street Path designation along this section. The TSP contains a new objective for the North District to address this discrepancy between the RTP and the TSP. (See "District Pedestrian-Related Objectives" on Page 5-71.)

The second exception is the 'Red Electric Line' alignment shown in the RTP. If completed, this trail would provide a link between the future Fanno Creek Greenway and the Willamette Greenway. The Southwest Urban Trails Plan discusses the possibility of this trail. A feasibility study is needed to determine if and where there should be an alignment. If the trail proves feasible, the TSP will be amended to add an Off-Street Path designation. The TSP contains a new objective for the Southwest District to address this discrepancy between the RTP and TSP. (See "District Pedestrian-Related Objectives" on Page 5-73)

The final exception is the Banfield (I-84) trail alignment in the Northeast District. This alignment is designated as a Multi-use Path in the RTP and will also be on the Regional Trails and Greenway Map. The City has incorporated the alignment in the bicycle modal plan and maps, but has not determined the alignment to be inappropriate for pedestrians. The alignment is on the TSP's Potential Studies list.

2040 Growth Concept

The 2040 Growth Concept lays out a network of main streets and corridors. Main streets are linear corridors of district-wide importance, characterized by dense commercial and mixed-use development and transit-supportive residential uses, frequent transit service, and high pedestrian use. SE Hawthorne Boulevard and NW 23rd Avenue are often cited as examples of main streets. Similar to main streets, corridors emphasize high-quality transit and pedestrian and bicycle

improvements; however, less intensive land uses are planned for them.

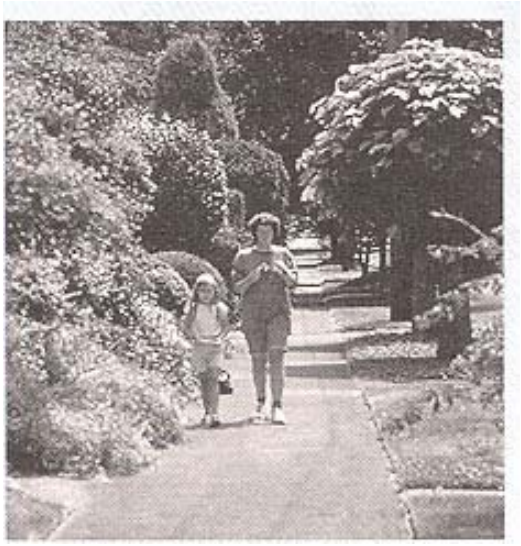
A Main Street Pedestrian Design Area overlay was adopted by resolution as part of Portland's Pedestrian Master Plan. This overlay is a refinement of the City Walkway street classification. It is applied to 2040 Growth Concept main streets that meet the land use and transit guidelines for Pedestrian Districts.

Main Street Pedestrian Design Areas share many characteristics with Pedestrian Districts, and the design treatment would be similar for both. A Main Street Pedestrian Design Area differs from a Pedestrian District in being a linear corridor rather than a compact district, and an overlay rather than a TSP classification. As the City implements new zoning that supports the Main Street Pedestrian Design Area criteria, additional City Walkways may be designated for the design areas by amending the Pedestrian Master Plan.

The TSP will also implement the 2040 Growth Concept through better pedestrian access to transit. This will be achieved through the addition of Pedestrian Districts, as well as the addition of transit classifications.

Approach to Mode

To promote walking as the preferred mode for short trips, the Portland region has a vision of neighborhoods with well-connected, human-scale streets; concentrated areas of activity; interesting landscapes; and pedestrian amenities. Neighborhoods will provide safe, convenient, and pleasant walking environments and increase residents' accessibility to local destinations. These pedestrian-oriented neighborhoods will be linked by high-quality transit, providing residents with greater regional accessibility. Education of all transportation users regarding safe driving and pedestrian rights will increase pedestrian safety.



To help the region move towards this vision, the City's approach to the pedestrian system continues to emphasize capital projects. Portland has decided it can make the greatest contribution to encouraging pedestrian travel by providing facilities (such as sidewalks, curb ramps, and crossings) where they are most needed. These facilities improve the attractiveness and quality of the pedestrian environment. This approach is directly related to the adopted pedestrian goals and policies in Portland's Comprehensive Plan.

Policy Framework

City of Portland Pedestrian Master Plan

The City of Portland Pedestrian Master Plan was adopted in 1998, following an extensive needs assessment and active citizen involvement process. The Pedestrian Master Plan establishes a 20-year framework for improvements that will enhance the pedestrian environment and increase opportunities to choose walking as a mode of transportation. The plan includes pedestrian policies, pedestrian street classifications, pedestrian design guidelines, a list of capital projects, and a set of recommended funding strategies. The TSP updates the policies and street classifications in the Pedestrian Master Plan. (Other sections of this modal plan discuss other elements of the plan, including the Pedestrian Design Guide and programs.)

City of Portland Comprehensive Plan

The City of Portland's Comprehensive Plan contains statements that guide how the City plans and implements improvements. In addition, a number of district and neighborhood plans have been adopted that contain more area-specific statements. These statements are ordered from the general to the specific as goals, policies, objectives, and action items. Goals, policies, and objectives are formally adopted by City Council Ordinance. Action items are recommended steps to achieve the objectives, but are not formally adopted by City Council.

The Comprehensive Plan addresses a broad range of goals for the City. Most policies relating to transportation are found in the Transportation Element of the Comprehensive Plan, which encompasses Goal 6: Transportation, Goal 11B: Public Rights-of-Way, and the Central City Transportation Management Plan (CCTMP). Other policies relating to pedestrians are found in Goals 2, 5, 7, 8, and 12.

Goal 6 Transportation

Policies and objectives within Goal 6 that relate to pedestrian transportation are primarily under Policy 6.23, Pedestrian Transportation, which states:

> Plan and complete a pedestrian network that increases the opportunities for walking to shopping and services, schools and parks, employment, and transit.

The objectives for Policy 6.23 address:

A. Promote walking as the mode of choice for short trips by giving priority to the completion of the pedestrian network that serves Pedestrian Districts, neighborhood shopping, schools, and parks.

B. Support walking to transit by giving priority to the completion of the pedestrian network that serves transit centers, stations, and stops; providing adequate crossing opportunities at transit stops; and planning and designing pedestrian improvements that allow adequate space for transit stop facilities.

C. Improve the quality of the pedestrian environment by implementing pedestrian design guidelines to ensure that all construction in the right-of-way meets a pedestrian quality standard and by developing special design districts for Pedestrian Districts and main streets.

D. Increase pedestrian safety and convenience by identifying and analyzing high pedestrian collision locations; making physical improvements, such as traffic calming, signal improvements, and crossing improvements in areas of high pedestrian use; and supporting changes to adopted statutes and codes that would enhance pedestrian safety.

Other pedestrian-related policies and objectives in Goal 6 are as follows.

Policy 6.8, Pedestrianway Classification Descriptions, describes the type of pedestrian use that should be emphasized on each street and how future street improvements and public and private development relate to those uses. These classifications update those contained in the Pedestrian Master Plan. They also supercede the classifications in the CCTMP, except for the Central City Transit/Pedestrian Street classification, which remains unique to the Central City.

The pedestrian classifications are described briefly below. Chapter 2 contains the full text.

- Pedestrian Districts are areas with a dense mix of land uses, convenient and frequent transit service, and a compact and walkable size. Pedestrian districts are intended to give priority to pedestrian access where high levels of pedestrian activity exist or are planned.

- City Walkways are intended to provide safe, convenient, and attractive pedestrian access to activities along major streets and to recreation and institutions within and between neighborhoods.

- Off-Street Paths are intended to serve recreational and other walking trips with a transportation purpose. Off-Street Paths are located along the rivers, in parks, or in forest areas where streets do not exist.

- Local Service Walkways are intended to serve local circulation needs for pedestrians and provide safe and convenient access to local destinations.

- Central City Transit/Pedestrian Streets are intended to accommodate high levels of pedestrian traffic, provide urban design features to promote pedestrian activities, and provide visual signals to motor vehicles to respect the presence and priority of pedestrians and transit along the street.

The Pedestrian Design Guide provides specific guidance on the design treatment of each classification.

Policy 6.3, Transportation Education, states:

> Encourage walking by developing education programs for both motorists and pedestrians and by supporting and participating in encouragement events for pedestrians. (Objective C)
>
> Increase public awareness of the benefits of walking and bicycling and of available resources and facilities. (Objective E)

Policy 6.20, Connectivity, states:

> Provide interconnected local and collector streets to serve new development and to ensure safe, efficient, and convenient pedestrian, bicycle, and vehicle access with preference for public streets. (Objective A)
>
> Provide convenient and safe bicycle and pedestrian connections to transit routes, schools and parks, as well as within and between new and existing residential developments, employment areas, and other activity centers where street connections are not feasible. (Objective C)

Policy 6.21, Rights-of-Way Opportunities, states:

> Evaluate opportunities and the existing and future need for a bikeway, walkway, or other transportation use when considering vacation of any right-of-way. (Objective A)
>
> As a condition of street vacation, require pedestrian and bicycle facilities if needed. Give first preference to a dedicated right-of-way and second preference to a public walkway/bikeway easement. (Objective B)

DISTRICT PEDESTRIAN-RELATED OBJECTIVES

District-specific objectives addressing pedestrian access and infrastructure improvements are contained in Policy 6.34 through Policy 6.40 for the seven Transportation Districts: North, Northeast, Far Northeast, Southeast, Far Southeast, Northwest, and Southwest. Selected objectives are listed below; the complete text of district policies and objectives is provided in Chapter 2.

North:

- Improve pedestrian and bicycle access within the St. Johns Town Center. (Policy 6.34, Objective I)
- Complete the sidewalk system in North Portland, including enhanced pedestrian crossings. (Policy 6.34, Objective K)
- Consider extension of the Willamette Greenway Trail south following the outcome of a feasibility study. (Policy 6.34, Objective L)

Northeast:

- Enhance pedestrian access to and improve transit service to regional and district commercial areas. (Policy 6.35, Objective B)

- Implement the projects recommended in the Columbia Corridor Transportation Study that improve safety for all modes and local connections. (Policy 6.35, Objective I)

- Implement the recommendations in the Hollywood and Sandy Plan to create a pedestrian-friendly and transit-supportive town center and main street. (Policy 6.35, Objective J)

- Bring substandard streets up to city standards. (Policy 6.35, Objective L)

Far Northeast:

- Implement the transportation goals developed for the Gateway regional center by focusing on 102nd as a main street boulevard. (Policy 6.36, Objective D)

- Add pedestrian facilities, including sidewalks and crossings, and enhancements such as street trees and drinking fountains to provide good access within neighborhoods and to Gateway and other commercial areas. (Policy 6.36, Objective F)

Southeast:

- Facilitate pedestrian access and safety by improving connections to the Willamette River; adding connections between neighborhoods and parks, institutions, and commercial areas; and enhancing pedestrian crossings with curb extensions and improved markings. (Policy 6.37, Objective D)

- Support SE Tacoma's function as a main street, and implement transportation projects that will reinforce this designation. (Policy 6.37, Objective L)

Far Southeast:

- Accommodate bicyclists and pedestrians along arterials and at crossings. (Policy 6.38, Objective C)

- Provide adequate street connections in the Far Southeast District through the development of a master street plan. (Policy 6.38, Objective F)

- Support transit and pedestrian-friendly development along the Division main street. (Policy 6.38, Objective G)

- Implement the Gateway Concept and Redevelopment Strategy recommendations to provide street connections as redevelopment occurs. (Policy 6.38, Objective I)

- Improve pedestrian access at the light rail transit stations by adding local street connections and improvements. (Policy 6.38, Objective J)

Northwest:

- Incorporate pedestrian and bicycle access improvements into all transportation projects, especially along arterials and at crossing locations. (Policy 6.39, Objective C)

- Reinforce the Northwest District main streets by retaining and improving their pedestrian-oriented character and improving access to transit. (Policy 6.39, Objective E)

- Preserve on-street parking, adding street trees, and buffering pedestrians from traffic. (Policy 6.39, Objective G)

- Limit transportation projects on West Burnside to those that reduce vehicle miles traveled, give preference to transit, improve pedestrian and bicycle access, or improve safety. (Policy 6.39, Objective H)

Southwest:

- Improve the primary transportation functions of SW Neighborhood Collectors by supporting pedestrian, bicycle, and transit use; calming traffic; and discouraging heavy volumes of non-local commuter traffic. (Policy 6.40, Objective B)

- Consider designation of a 'Red Electric Line' alignment for pedestrians and bicyclists, as identified in the Southwest Urban Trails Plan, upon completion of a feasibility study. (Policy 6.40, Objective C)

Goal 11B Public Rights-of-Way

Goal 11B, Public Rights-of-Way, and its policies and objectives describe how the City's transportation system should be designed and built. Pedestrian-related policies and objectives under Goal 11B include:

- Promote a compact urban form by supporting development in high-priority 2040 Growth Concept areas, including facilities and improvements that support mixed-use, pedestrian-friendly development and increase walking, bicycling, and transit use. (Policy 11.9, Objective A)

- Address existing deficiencies or hazards by improving pedestrian safety. (Policy 11.9, Objective B)

- Consider the needs of all users of a planned facility in its design and construction process. (Policy 11.10, Objective B).

- Use a variety of transportation resources in developing and design projects such as the Pedestrian Design Guide. (Policy 11.10, Objective E)

- Include sidewalks on both sides of all new street improvement projects except where noted in the policy. (Policy 11.10, Objective G)

- Construct local residential streets to minimize pavement, but take into account the needs of pedestrians. (Policy 11.10, Objective J)

- Ensure that transportation facilities are accessible to all people and that all improvements to the system comply with the Americans with Disabilities Act. (Policy 11.10, Objective K)

- Encourage the formation of local improvement districts (LIDs) in currently developed areas for the construction of street improvements, including sidewalks, drainage, and street trees, where feasible. (Policy 11.10, Objective M)

Central City Transportation Management Plan

The pedestrian classifications in the CCTMP are: Pedestrian Districts, City Walkways, Off-Street Paths, Local Service Walkways, and Central City Transit/Pedestrian Streets. The TSP incorporates all these pedestrian classifications, except for Central City Transit/Pedestrian Streets, which remains unique to the Central City.

The CCTMP's pedestrian policies generally support a Central City that has a pedestrian-friendly environment with good connections to neighborhoods and a high level of availability, accessibility, convenience, safety, and attractiveness. The policies also address increasing the pedestrian mode split. (Chapter 2 of the TSP contains the complete text of the CCTMP policies and objectives.)

Other Pedestrian-Related Policies and Objectives

In addition to the Transportation Element (Goal 6, Goal 11B, and the CCTMP), the following Comprehensive Plan policies and objectives address pedestrian transportation.

RECREATIONAL TRAIL DESIGNATIONS.

Recreational Trails are Comprehensive Plan designations that are depicted as 'stars' on the City's Official Zoning Maps. Many, but not all, Recreational Trails are also classified as City Walkways and Off-Street Paths. PDOT is working with the Bureau of Planning and the Bureau of Parks and Recreation to determine the best approach to combine and/or incorporate the Recreational Trail designations into the transportation system. Initial analysis indicates that not all of the designated Recreational Trails have a true transportation (i.e., connectivity) purpose; it therefore may not be appropriate to incorporate all of them into the transportation system. There are also mapping inconsistencies among bureaus, making it difficult to determine where overlaps occur. This issue will not be fully addressed during the adoption of the TSP, but will be an ongoing effort.

Goal 2, Urban Development, Policy 2.12, Transit Corridors, states in part:

> Require development along transit routes to relate to the transit line and pedestrians and to provide onsite pedestrian connections.

Policy 2.16, Strip Development, states:

> Discourage the development of new strip commercial areas and focus future activity in such areas to create a more clustered pattern of commercial development.

Policy 2.17, Transit Stations and Transit Centers, states in part:

> Encourage transit-oriented development patterns at light rail transit stations and at transit centers to provide for easy access to transit service. The design and mix of land uses surrounding light rail transit stations and transit centers should emphasize a pedestrian- and bicycle-oriented environment and support transit use.

Goal 5, Economic Development, Policy 5.4, Transportation System, Objective E states:

> Promote safe and pleasant bicycle and pedestrian access to and circulation within commercial areas. Provide convenient, secure bicycle parking for employees and shoppers.

Goal 7, Energy, Policy 7.6, Energy Efficient Transportation, states in part:

> Provide opportunities for non-auto transportation including alternative vehicles, buses, light rail, bikeways, and walkways.

Objective H of Policy 7.6 states:

> Promote walking and bicycle commuting by developing bikeways and walkways, encouraging spot hazard improvements on city streets, providing bicycle lockers at transit centers and park-and-ride lots, implementing bicycle commuter services such as long-term bicycle parking, showers, and changing facilities, and promoting covered walkways/sidewalks.

Goal 8, Environment, Policy 8.4, Natural Resources, Objective H states:

> Enhance the value and beauty of Portland's bicycle and pedestrian routes by locating them to take advantage of significant viewpoints, scenic sites, and scenic corridors.

Goal 12, Urban Design, enhances the pedestrian environment through its policies of enhancing and extending "Portland's attractive identity" and providing a "pleasant, rich and diverse experience for pedestrians."

Policy 12.4, Provide for Pedestrians, states:

> Portland is experienced most intimately by pedestrians. Recognize that auto, transit and bicycle users are pedestrians at either end of every trip and that Portland's citizens and visitors experience the City as pedestrians. Provide for a pleasant, rich and diverse experience for pedestrians. Ensure that those traveling on foot have comfortable, safe and attractive pathways that connect

Portland's neighborhoods, parks, water features, transit facilities, commercial districts, employment centers and attractions.

Objectives:

A. Providing for pedestrians should be a primary mode of transportation throughout the City. Ensure that the safety and convenience of pedestrians are not compromised by transportation improvements aimed at motor vehicle traffic. Movement patterns for pedestrians should contribute to Portland's sense of community and provide for connections between areas of the City.

B. Enhance the environment occupied by Portland's pedestrians. Seek to enrich these places with designs that express the pleasure and hold the pleasant surprises of urban living.

C. Provide Portland's sidewalks with buffering from auto traffic and auto parking areas; provide trees that will shade sidewalks on hot days; provide sidewalks of adequate width to accommodate the pedestrians that future development is expected to generate; provide convenient connections from sidewalks to parks, developments, and attractions; and ensure that the pedestrian circulation system is safe and accessible to children, seniors and the disabled (including the blind).

D. Reinforce commercial areas that include a storefront character and/or are on transit streets by requiring development to be oriented to pedestrians.

E. Complete the 40-Mile Loop and Willamette Greenway trails and establish links between these trails and Portland's residential neighborhoods and parks.

F. Link Portland's trails and parks to the system of greenspaces being created for the metropolitan region.

G. Retain rights for pedestrian access and circulation when considering requests for street vacations. Preserve existing pedestrian routes and protect routes needed by pedestrians in the future. Ensure that street vacations do not reduce access to light and air or the intimate scale that is so much a part of Portland's character.

Most district and neighborhood plans, which are adopted as part of the Comprehensive Plan, have policies and/or objectives that address pedestrian transportation. These plans typically focus on the need for safe and convenient pedestrian access to neighborhood destinations such as schools and parks and on providing signage on designated routes.

Existing Conditions

Summary of Inventory

An adequate pedestrian network requires supportive physical infrastructure (sidewalks, curb ramps, crossings), interconnected destinations within walking distance, and a comfortable, attractive pedestrian environment. To assess the non-qualitative elements of the pedestrian network, the City took an inventory of sidewalks and curb ramps on all street segments within the city limits in fall 1994.

The sidewalk inventory revealed that the inner, older neighborhoods are much more likely to have completed sidewalk systems than the more recently annexed areas of Portland such as the outer east neighborhoods or southwest. Within each Transportation District, the pattern of sidewalk distribution between local and arterial streets is fairly similar. Citywide, a slightly greater percentage of local streets have sidewalks than do arterial streets. (Figure 4-2 of the Pedestrian Master Plan shows the Sidewalk Inventory Map.)

The curb ramp inventory showed that, as of 1994, Portland had ramps at approximately one-third of all corners. Ramps are more concentrated in business districts and along transit routes. There is a greater deficiency of ramps at 'T' intersections than at other intersections.

Pedestrian Districts

The concept of the Pedestrian District was introduced in Portland in 1977 as part of the original Arterial Streets Classification Policy. Pedestrian Districts are typically compact walkable areas of intense pedestrian use, with a dense mix of land uses and good transit service, where walking is intended to be the primary mode for trips within the district. The 21 areas classified as Pedestrian Districts outside the Central City and the six within the Central City are listed below.

Transportation Element Pedestrian Districts outside the Central City (with transportation district initials in parentheses) are:

- St Johns (N)
- Kenton (N) – revised from 1996
- Woodlawn (NE)
- Killingsworth (NE)
- Boise (NE)
- Eliot (NE)
- Hollywood (NE)
- Montavilla (FNE)
- Gateway (FSE, FNE) – revised from 1996
- Ventura Park (FNE) – revised from 1996
- Northwest (NW)
- Lents (FSE) – revised from 1996
- Hillsdale (SW) – revised from 1996
- Multnomah Village (SW)
- Johns Landing (SW)

- Lair Hill (SW) – new
- Bridgeton (NE) – new
- 60th Station (NE, SE) – new
- 82nd Station (NE, SE) – new
- 148th Station (NE, SE) – new
- 162nd Station (NE, SE) – new

Central City Transportation Management Plan Pedestrian Districts are:

- North Macadam
- Downtown
- Goose Hollow
- North of Burnside
- River District
- Lloyd-Coliseum

Over time, new Pedestrian Districts may be added or existing districts may be revised. For example, several areas in Portland are identified as regional Pedestrian Districts in the RTP, but were not classified as Pedestrian Districts in Portland's 1996 Transportation Element. The TSP incorporates these new Pedestrian Districts.

New and revised Pedestrian Districts should meet certain essential criteria to ensure they are consistent with the policy established in the Comprehensive Plan. The guidelines for new or expanded Pedestrian Districts relate to zoning, transit service, size, and configuration. (Chapter 2 of the Pedestrian Master Plan provides a detailed description of the relevant guidelines.)

Creating or revising Pedestrian Districts requires amending the Transportation Element of the Comprehensive Plan.

Existing Deficiencies

High-Crash Locations

The State of Oregon collects crash data and makes it available to the City annually. High-crash locations were identified during the Pedestrian Master Plan process, based on data from 1991 to 1995. This analysis revealed that automobile/pedestrian crashes tended to be distributed along major arterial routes, particularly where two arterial streets intersect.

As a result of this process, the Pedestrian Master Plan recommends crossing improvements for two intersections with high crash rates (N Lombard at Interstate Avenue and SE Foster Road at 82nd Avenue). In addition, a number of projects on the TSP Project List address some of the high auto/pedestrian crash statistics. These improvements and projects include multimodal and signal improvements at SE 39th and Hawthorne, and pedestrian and crossing improvements along inner West Burnside, SE 122nd, and N Killingsworth.

According to more recent data, the intersections with the highest crash rates are:

- SE Powell Boulevard at 82nd Avenue
- N Interstate Avenue at Lombard Street
- SE Division Street at 122nd Avenue
- E Burnside Street at Grand Avenue
- SE Hawthorne Boulevard at 39th Avenue
- W Burnside Street at 4th Avenue
- SW Broadway at Jefferson Street
- NE Killingsworth Street at 72nd Avenue
- SW Broadway at Harrison Street
- SE Woodstock Boulevard at 45th Avenue
- NE Glisan Street at 82nd Avenue

Deficiency Index

The Pedestrian Deficiency Index, developed through the Pedestrian Master Plan process, measures how critically pedestrian improvements are needed by assigning a value to each street segment. This value is based on several factors: missing sidewalks, difficult and dangerous street crossings, and lack of a connected street network.

Information about missing sidewalks was based on the 1994 sidewalk inventory data. Difficult and dangerous street crossings were evaluated based on traffic speed, traffic volume, roadway width, and high-crash locations. Lack of a connected street network was approximated by giving points to especially long street segments.

Streets of highest deficiency tended to be toward the edges of the City, with the notable exception of inner West Burnside, which has a high deficiency rating based as a result of high auto/pedestrian crash counts. (Figure 4-5 of the Pedestrian Master Plan shows the Deficiency Index Map.)

Status and Conditions Report

PDOT prepares an annual status and conditions report for transportation facilities. The latest report was published in 2000, but reflects 1997 data. The 2000 report indicates that the City has 2,117 lineal miles of sidewalk and 54,870 street corners.

Issues from District Needs Assessment

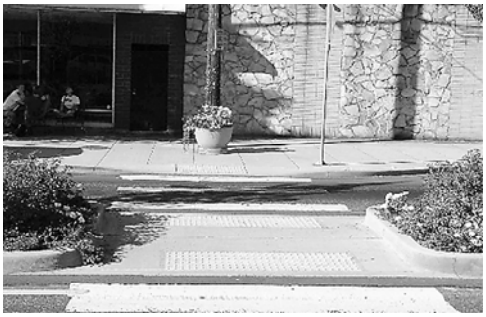
In fall 1998, PDOT held TSP workshops in each of the Transportation Districts to gather information about transportation issues and community needs. Participants were asked to identify needed transportation improvements in their neighborhood and indicate their top three priority issues, or 'transportation values.'

Four of the top seven values identified in the workshops relate directly to pedestrian travel: safety and livability on local streets; sidewalks, curb cuts, and off-street facilities; greater connectivity; and more transportation choices. Increasing safety and livability was especially important in the Northwest, North, Northeast, and Southwest Districts. Adding or improving sidewalks, curb cuts and other off-street facilities was a major concern in the North, Far Northeast, Southwest, Southeast and Far Southeast Districts. Improving connectivity was especially important in the Far Northeast, Southwest and Far Southeast Districts. Providing more transportation choices was one of the top priorities in Southeast.

Implementation Measures

Pedestrian Design Guide

The Portland Pedestrian Design Guide was created as a companion to the Pedestrian Master Plan. It was developed through a consensus-building process involving each of the programs and agencies responsible for the form and function of the public right-of-way.

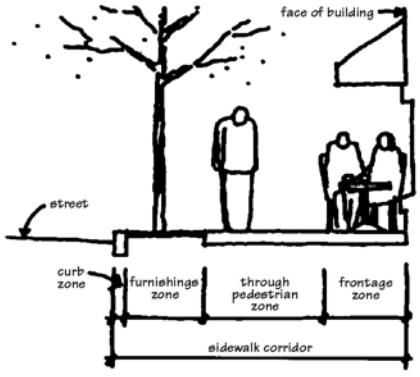


'Domes', being tested at SW Woodstock, are intended to assist visually-impaired pedestrians.

Many transportation activities share the public right-of-way, including walking, bicycling, transit, freight movement, and automobile travel. Each function has specific design needs and constraints. Accommodating the variety of functions often results in an environment that discourages pedestrian travel.

The Pedestrian Design Guide integrates the wide range of design criteria and practices related to the public right-of-way into a coherent set of new standards and guidelines that, over time, will promote an environment conducive to walking. It also attempts to bring together the many disparate regulations and codes that relate to pedestrian travel, including the Americans with Disabilities Act (ADA) of 1990, the City Code, some of the Standard Construction Specifications issued by the City Engineer, and other engineering guidelines issued by various national organizations.

The City Engineer issues the Pedestrian Design Guide, and every project designed and built in the City of Portland should conform to these guidelines. The Pedestrian Design Guide comprises both general design principles, which should be incorporated into every pedestrian improvement, and design guidelines for specific elements of the pedestrian network. The design principles state that a pedestrian environment should be safe and accessible to all, connect to places people want to go, be easy to use and provide good places, and be economical and used for many things.



The design guidelines describe the attributes of good sidewalk corridors, street corners, crosswalks, pathways, and stairs. For each of these pedestrian network elements, the guidelines also outline the associated legal aspects of making additions and improvements to the system and provide guidance for designing and implementing the improvements.

The most basic element of the pedestrian network is the area intended for pedestrian travel. Within sidewalk corridors, this area is referred to as the through pedestrian zone. The recommended widths for this zone range from 10 feet to 15 feet, depending on the street classification and the density of the surrounding area. Narrower widths are not

recommended for new construction, but are accepted in existing constrained conditions where increasing the sidewalk width is not practicable. (Table A-1 of the Pedestrian Master Plan provides additional detail.)

For City arterial streets where construction to a full urban standard is not anticipated, the guidelines provide for two types of alternative pathways: separated pathways and widened shoulder pathways. The Pedestrian Design Guide also provides a hierarchy of materials and treatment methods to guide the development of pathways. For example, pathway materials range from concrete (most preferred) to bark mulch (least preferred) and should be selected based on a number of criteria, such as safety, durability, amount of use, impact, and cost. It is important to note that these alternative treatments are intended to be interim improvements and are not intended to fulfill development requirements for street improvements.

Southwest Urban Trails Plan

City Council adopted the Southwest Urban Trails Plan in July 2000. The plan is a collaborative effort among PDOT, Southwest Portland neighbors, and the Southwest Trails Group. Its purpose is to increase pedestrian access throughout Southwest Portland for recreation and transportation. The plan identifies an urban trail network linking pedestrians to schools, parks, transit, shopping, regional trail systems, and adjacent cities. Urban trails are a combination of existing public roads, sidewalks, stairs, trails, and walkways, as well as proposed trail routes and improvements primarily through unimproved public rights-of-way and across parks and schools.

The trails have been incorporated into the TSP's structure of pedestrian designations. Many of the trails occur on Local Service Streets. When consistent with policies, trail segments are designated as Off-Street Paths or City Walkways. Some of the projects in the plan were large enough to be included in the TSP project list (see Chapter 3), while others are on the reference list. The final trails map is referenced in Policy 6.40 Southwest Transportation District, Objective E. and included in Appendix B.

Hollywood-Sandy Plan Pedestrian Component

The Hollywood-Sandy Plan, adopted by City Council in April 2000, identifies a number of pedestrian improvements needed to support the Sandy main street and Hollywood town center. While sidewalks are present along virtually all street frontages, they are typically less than the 12-foot and 15-foot widths appropriate for City Walkways and arterials in pedestrian districts such as Hollywood. Additional pedestrian crossings are needed for better access to transit.

The transportation concept for the Hollywood-Sandy Plan identifies additional signalized pedestrian crossings at NE 14th, 31st, and 35th. Curb extensions and medians are proposed for several locations, such as NE 37th, to reduce crossing distances. Northeast 42nd from Tillamook to the transit center and NE Sandy from 37th to 47th are identified as 'enhanced pedestrian streets' where the highest level of pedestrian enhancements should be focused. The enhancements would include streetscape improvements, traffic modifications, curb extensions, and improved crossings.

Existing Regulations

All new development, changes to existing development, and changes in the type or number of uses must comply with the zoning regulations in the City Code. Title 33: Planning and Zoning, has the most consequence for the pedestrian mode. Other pedestrian-related regulations are contained in Title 14: Public Peace, Safety and Morals; Title 16: Vehicles and Traffic; and Title 17: Public Improvements. These regulations implement the goals and policies of the Comprehensive Plan.

Title 33

BASE ZONES

In single-dwelling and multi-dwelling residential zones, a variety of standards influence the pedestrian environment. Building and garage setbacks maintain the scale and placement of buildings, promote ”open, visually pleasing front yards,” and minimize the obtrusiveness of vehicle areas. Institutional development standards are intended to “maintain compatibility with and limit the negative impacts on surrounding residential areas” by requiring, for example, buffer zones, landscaped areas, and minimum building setbacks of 15 feet. In pedestrian districts and on transit streets, additional standards (such as reduced setbacks) are provided for institutional uses to “reduce reliance on the automobile and encourage pedestrians and transit riders by ensuring safe and convenient pedestrian access to buildings.”

In high-density multi-dwelling zones, commercial zones, and higher-density employment and industrial zones, standards are generally intended to provide a pedestrian orientation and create an environment that is inviting to pedestrians. These include minimal building setbacks, landscaped area and ground floor window requirements, and pedestrian standards.

Pedestrian standards primarily address connectivity and apply to all development (except houses, attached houses, and duplexes) in multi-family, commercial, and employment zones. The standards are intended to “encourage a safe, attractive, and usable pedestrian circulation system in all developments. They ensure a direct pedestrian connection between the street and buildings on the site, and between buildings and other activities within the site. In addition, they provide for connections between adjacent sites, where feasible.”

The basic requirement of the pedestrian standards is an onsite pedestrian circulation system that connects the main entrance to all adjacent streets, and provides connections between all buildings and to all amenities on the site. The circulation system must be hard surfaced, at least 5 feet wide (6 feet in commercial and employment zones), and lighted to allow for night use. If the system crosses driveways, parking areas, and loading areas, it must be visually separated, using a different elevation or paving material or other method. If it runs parallel and adjacent to auto travel lanes, the system must be a raised path or be separated by a physical barrier.

ADDITIONAL USE AND DEVELOPMENT REGULATIONS

Community design standards ensure that new development “enhance the character and livability of Portland’s neighborhoods” through methods such as landscaping and building design requirements, vehicle parking restrictions, and pedestrian access standards.

Standards for public recreational trails improve the pedestrian environment by supporting alternative travel modes, providing connections to other transportation systems, and creating a "pleasant, aesthetically-pleasing urban environment".

In designated areas, special street setback requirements maintain appropriate open areas and adequate separation from the street to "increase visibility and safety for pedestrians and drivers; provide a pleasant pedestrian environment and human scale; [and] improve the appearance of the corridor and reduce visual clutter".

Superblocks standards regulate the amount and location of open areas and walkways on large commercial sites where streets have been vacated, in order to promote an improved system of walkways and open areas that link to adjacent buildings, the public circulation system, and any available public transit.

The regulations may be modified or adjusted if a site is difficult to develop in compliance with the regulations and the proposed development meets the intended purpose of the regulations, or when strict application of the regulations would prevent all use of a site.

OVERLAY ZONES AND PLAN DISTRICTS

Overlay zones and plan districts modify the regulations of the base zone in a variety of areas identified on the City's Official Zoning Maps. Overlay zones consist of regulations that address specific subjects; plan districts consist of regulations tailored to a specific area of the City. Those that are particularly relevant to the pedestrian environment are briefly described below.

Design overlay zones are intended to ensure that infill development in areas where design and neighborhood character are of special concern is compatible with the neighborhood and enhances the area. Specific guidelines are adopted for each design district or subdistrict. Areas outside a design district but within a design overlay zone use the community design standards.

Although not currently applied anywhere, light rail transit station overlay zones have potential implications for the pedestrian environment. These zones promote a pedestrian-oriented and transit-supportive environment by encouraging mixed uses; built-up, intensive areas of shops; and activities near light rail stations.

Plan districts with special pedestrian regulations have been designated for Central City, Columbia South Shore, Gateway, Hillsdale, Johnson Creek Basin, Macadam, North Cully, and South Auditorium. Because of variations in use and character, each plan district applies a unique set of pedestrian regulations. The regulations generally comprise one or more of the following: special setbacks, site design requirements, ground floor window standards, streetscape standards, parking restrictions, density bonuses, restrictions on drive-through facilities, and pedestrian access requirements.

New Regulations

Title 33

Pedestrian-related changes in Title 33 focus on clarifying and improving the building setback along transit streets and in Pedestrian Districts and clarifying and strengthening

main entrance requirements along transit streets. The recently adopted subdivision regulations (formally Title 34 of the Zoning Code) improved regulations for pedestrian connections and pedestrian facilities for sites that are subdividing based on Metro's standards for connectivity.

Title 17
New provisions are being added to Title 17 to address the need for street and pedestrian connections on large sites being developed but not subdivided using Metro's RTP standards for connectivity – 530 feet for full street connections and 330 feet for pedestrian connections where full streets are not feasible.

Programs and Strategies

PDOT funds a pedestrian coordinator position within Transportation Planning. The Transportation Options Division and Traffic Investigations Section fund other activities associated with promoting pedestrian facilities, education, and safety.

Audible Pedestrian Signals
The Audible Pedestrian Signals (APS) program is a joint effort of PDOT's Transportation Options Division and Signals and Street Lighting Section to increase the number of audible signals for blind and low-sighted pedestrians. PDOT recently received an ODOT grant to install 50 new signals, adding to the existing 35 locations.

Traffic Calming
The Traffic Investigations and Transportation Options Division reviews and installs traffic calming measures such as speed bumps, traffic circles, and curb extensions. Most traffic calming measures enhance the pedestrian environment and increase pedestrian safety. A number of traffic calming projects will be reviewed and funded through PDOT's CIP process.

Education and Outreach
The 1998 Pedestrian Master Plan includes education and encouragement. PDOT's Transportation Options Division leads education and outreach efforts. Safety education includes safety curricula for elementary and middle schools and Walk Your Kids to School Day. The division also conducts walks and publishes materials to encourage and educate citizens about the benefits of walking.

Safe Routes to Schools
Safe Routes to Schools is a program designed to enable and encourage children to walk and bicycle to and from school. The intent of the program is to identify routes used by children to reach schools and analyze potential problems. Safe Routes to Schools began in Oregon in 2001 with the passage of House Bill 3712. The legislation directs cities and counties to work with school districts to identify hazards that keep children from walking and bicycling to school safely. Five schools in Portland received small grants to establish community task forces to develop plans for their schools. The program looks at conditions near schools such

as traffic speeds, amount of truck and bus traffic, lack of sidewalks, sidewalk condition, unsafe crosswalks, pedestrian-unfriendly intersections, and missing links in the transportation system that makes it difficult for children to walk and bicycle to school. Transportation staff participated on the task forces and facilitated discussions on traffic safety problems, helped to design student and parent surveys on travel behavior and attitudes, produced maps and educational materials for classroom instruction, made small operational improvements in school zones to improve pedestrian safety. With additional funding, larger scale projects such as curb extensions, pedestrian refuge islands, speed bumps, raised crosswalks, traffic circles, and flashing beacons. Safe Routes to Schools is one of several education, enforcement, and engineering programs recommended in the Neighborhood Traffic Safety Plan (see Motor Vehicle Modal Plan – Programs).

Facilities Tracking

PDOT is working to provide a better database and tracking system of pedestrian facilities, using the TSP benchmarks and PDOT's internal Information Management System (IMS) program. The TSP performance measures and benchmarks will track the percentage of streets and pathways improved with complete pedestrian facilities. These benchmarks will be reviewed every five years. The IMS program will use work orders, permitting, and computer mapping to track existing and new facilities as they are planned, permitted, and constructed.

Local Improvement District Program

The City rarely builds local street improvements, including sidewalks. Property owners usually use the local improvement district (LID) process to improve existing streets. The affected property owners must vote to approve the improvements and pay a portion of the cost. The City recently revised the LID process and standards to provide additional funding and flexibility in order to increase the number of local street improvements.

Curb Ramp Program

The ADA Curb Ramp Request Program identifies and builds new curb ramps throughout the City to enhance accessibility. Each year, staff and area residents identify locations that need additional ramps. PDOT's pedestrian coordinator works with Bureau of Maintenance staff and the Metropolitan Human Rights Center to provide outreach, database maintenance, site inspections, prioritization, and construction. The program constructs approximately 100 ramps each year.

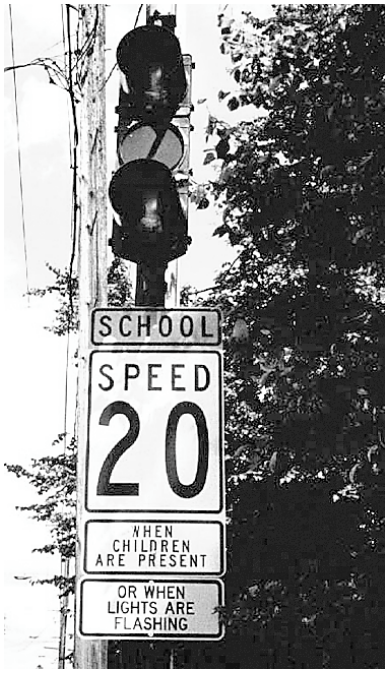
Project Review

PDOT is working to improve its system for moving projects from the TSP to the CIP. It is creating procedures and criteria to review and prioritize pedestrian projects that are identified during the year, prior to a TSP update.

Other Programs

The pedestrian coordinator works with staff throughout PDOT to obtain funding for pedestrian and signal projects; advises on and monitors transportation plans and projects; and coordinates with Metro on regional trail and pedestrian plans and projects.

Projects



Many TSP projects over the next 20 years, such as new streets, seismic upgrades for bridges, and redesign and redevelopment of streets, will include pedestrian-related improvements. Other transportation projects, such as traffic signals and turning lanes, may also have benefits for pedestrians.

The TSP identifies the following significant pedestrian improvements (not listed in order of importance or funding priority). (Chapter 3 provides the complete project list and additional details.)

- Pedestrian improvements and safe crossings, streetscape improvements, and signal remodels on SE Hawthorne between SE 20th and SE 60th (Project No. 70029)

- Pedestrian improvements and safe crossings, curb ramp upgrades, sidewalks, and curb extensions in conjunction with transit and other street improvements on Burnside between SE 12th and NW 23rd (Project No. 20014)

- Design and construction of transportation and streetscape improvements on NE Alberta between NE Martin Luther King, Jr. and NE 33rd (Project No. 40026)

- Pedestrian, streetscape, and transportation improvements along SE Belmont between SE 12th and SE 43rd (Project No. 70009)

- Sidewalk and crossing improvements, main street design, and multi-modal improvements on NE Cully between NE Fremont and NE Columbia (Project No. 40037)

- High-priority pedestrian and local street improvements in Gateway Regional Center (Project Nos. 50018, 50019, and 50020)

- Multi-modal street improvements, improved pedestrian crossings, and connections to transit in the Hollywood Town Center (Project No. 40045)

- Improved pedestrian crossings, signals, and facilities on SE Powell between Ross Island Bridge and SE 26th (Project No. 70045)

- Improvements to the pedestrian environment within the Eliot, Woodlawn Park, and Montavilla Pedestrian Districts (Project Nos. 40038, 40076, 70043)

- Walkway to provide access to transit and schools on SW Hamilton between Scholls Ferry and Dosch (Project No. 90034)

- Bridge and pedestrian path to connect SW Lee to SW 43rd (Project No. 90044)

- Sidewalks and crossing improvements for pedestrians and access to transit on N Killingsworth between Denver and Greeley (Project No. 30030)

- Improved sidewalks, pedestrian access to transit, and pedestrian crossings on SE Division between I-205 and the city limits (Project No. 80009)

Other pedestrian improvements fall below the threshold for inclusion on the TSP 20-year project list, but are still important for completing the pedestrian network. These smaller projects tend to be lower in cost and/or fill in small gaps in the network. Most of them come from the Pedestrian Master Plan, neighborhood and community plans, or TSP district workshop suggestions. A small sample of these projects is listed below. (Appendix E contains the complete list.)

- Stairs in the SW 10th Avenue right-of-way from Burlingame to Bertha

- Pedestrian improvements on streets between SE 130th and 135th Avenues and SE Salmon and Mill in the vicinity of David Douglas High School

- Improvement of NW 26th to City Walkway standards

- Construction of a 70-meter off-street path connection in the SE 36th Place right-of-way between 36th Place and Francis

- Pedestrian connection from the Bridgeton neighborhood to Delta Park

- Public stairway within the SW Harrison right-of-way to link Harrison to 16th

- Sidewalks on N Portland Boulevard between Willamette Boulevard and 7th/Dekum

- Pedestrian connections in SW Portland consistent with the Southwest Urban Trails Plan

Conclusion

As the Pedestrian Master Plan states, "A community that is designed to support walking is livable and attractive." Implementation of the 2040 Growth Concept relies on creating compact centers that are walkable. Portland is committed to improving the pedestrian realm throughout the City and ensuring that walking is a viable choice for short trips.

BICYCLE MODAL PLAN

Introduction

The bicycle is a low-cost and effective means of transportation that is quiet, non-polluting, extremely energy-efficient, versatile, healthy, and fun. Bicycles also offer low-cost mobility to the non-driving public, including the young. In the United States, bicycles were a popular means of transportation in the pre-automobile age. As the automobile became more popular, bicycles lost their advantage as well as their place on the road. Now, as cities work to create more balanced transportation systems and make streets a safe place for all modes, the bicycle is making a comeback.

Since the 1970s, Portland residents have successfully advocated for improved bicycling conditions in the region. The City formed a Bicycle Path Task Force in 1972. A Bicycle Master Plan was created in 1973, but languished until 1978, when City Council appointed a citizen Bicycle and Pedestrian Advisory Committee. The committee worked on identifying and prioritizing improvements to the bicycle and pedestrian networks. That group evolved into separate advisory committees in 1992.

The Office of Transportation initiated the Bicycle Program in 1979 to create a bicycle map, develop bicycle-parking regulations, install bicycle racks and lockers, and organize events. The Bicycle Program emphasized various aspects of bicycling over the next two decades, depending on community interest and funding availability: corridor improvements, district improvements, bicycle parking, maintenance, and events and education.

The 1996 Bicycle Master Plan was created through a 2½-year effort that included extensive citizen outreach and input. The plan details the many elements that go into making Portland bicycle friendly. The improvements that resulted from these efforts, along with increased environmental awareness and improvements in bicycling equipment, have dramatically increased bicycle travel in Portland and have led policymakers at all levels to treat the bicycle as a serious mode of transportation.

This bicycle modal plan incorporates many elements of the Bicycle Master Plan, but does not replace it. The TSP updates the Comprehensive Plan policies and objectives contained in the Bicycle Master Plan, identifies a 20-year list of bicycle projects taken from the Bicycle Master Plan and other sources, and updates Table 3.2 (guidelines for selecting bikeway facilities) in Appendix A of the Bicycle Master Plan. The remainder of the Bicycle Master Plan remains in effect as the guiding document for improving bicycling in Portland.

Requirements

Transportation Planning Rule

In addition to the common elements that must be included in each of the modal plans (as described on page 5-2), the TPR also contains the following elements specific to bicycling:

> Identify a network of bicycle routes throughout the planning area and a list of facility improvements that are consistent with ORS 366.514, which requires that at least one percent of the funds received from the State Highway Fund each year be spent on bicycle trails (and footpaths) along highways, roads or streets and in parks and recreation areas.

In addition to the modal plan requirements, other sections of the TPR address bicycle transportation. Section 660-012-045 requires jurisdictions to adopt regulations so that development will provide onsite facilities that will accommodate "safe and convenient pedestrian and bicycle access" from and within residential, commercial, and other activity centers and to transit. Section 660-012-045(3)(b)(B) states: "Bikeways shall be required along arterials and major collectors." Development that requires offsite road improvements must accommodate "convenient pedestrian and bicycle travel, including bicycle ways along arterials and major collectors." The TPR defines "safe and convenient" as "reasonably free from hazards, particularly types or levels of automobile traffic, which would interfere with or discourage pedestrian or cycle travel for short trips."

2000 Regional Transportation Plan

The first RTP bicycle policy focuses on providing a continuous regional network of safe and convenient bikeways that connect to other transportation modes and local bikeway systems. The second bicycle policy focuses on increasing the bicycle mode share throughout the region and improving bicycle access to the region's public transportation system.

The regional bikeway system identifies a network that provides mobility among the Central City, regional centers, and town centers, as well as easy accessibility among and within them. A system of on-street and off-street regional bikeway corridors, multi-use paths, and local bikeways forms a complementary and continuous network. Portland's bicycle network and classifications must be consistent with the 2000 RTP bicycle system. Although the bikeway classifications in the RTP and TSP are somewhat different from each other, they are consistent (see Table 5.8).

Table 5.8
Comparison of Bicycle Classifications

2000 RTP	Portland TSP
Regional Access Bikeway	City Bikeway
Regional Corridor On-Street Bikeway	City Bikeway
Community Connector Bikeway	City Bikeway
Regional Corridor Off-Street Bikeway	Off-street Path
Not mapped	Local Service Bikeway

With two exceptions, the TSP classification maps contain all of the regionally designated bikeways. The first exception is an extension of the Willamette Greenway Trail from its existing designation that ends south of the St. Johns Bridge to a connection with the existing designation on Swan Island. The extension would go through an area of north Portland that currently has industrial sanctuary zoning along most of it. The City is conducting a feasibility study for this extension. If the extension proves feasible, the TSP will be amended to add an Off-Street Path designation. The TSP contains a new objective for the North District to address this discrepancy between the RTP and the TSP. (See "District Bicycle-Related Objectives" on page 5-96)

The second exception is the 'Red Electric Line' alignment shown in the RTP. If completed, this trail would provide a link between the Fanno Creek Greenway and the Willamette Greenway. The Southwest Urban Trails Plan discusses the possibility of this trail. A feasibility study is needed to determine if and where there should be an alignment. If the trail proves feasible, the TSP will be amended to add an Off-Street Path designation. The TSP contains a new objective for the Southwest District to address this discrepancy between the RTP and TSP. (See "District Bicycle-Related Objectives" on page 5-96)

Approach to Mode

The City's approach to the bicycle system focuses primarily on capital projects and bicycle education. Capital projects include expanding the existing bikeway network and providing end-of-trip facilities, such as short-term and long-term bicycle parking (including at transit centers and MAX stations to improve the bicycle/transit link), showers, changing rooms, and clothing storage. Bicycle education and encouragement efforts are concerned with developing safe, responsible bicycling skills in children and adults, teaching motorists how to share the road, and increasing public awareness of the benefits of bicycling. This approach is directly related to the goals and policies adopted in Portland's Comprehensive Plan.

The City is now shifting its bicycle capital spending to focus on filling in gaps in the existing network, as well as expanding the network. The City is also focusing on improved bike signage along the bike routes; the goal is to develop a network of signs that will guide bicycle riders along developed bikeways and to major destination points. In addition, the City continues to concentrate on providing convenient and secure short-term and long-term bicycle parking at all expected destinations, This approach is intended to emphasize Portland's interconnected bicycle network and make bicycling more attractive as a mode of travel.

Bicycle lanes alert merging drivers on the approach to the Broadway Bridge to where bicyclists will be

Policy Framework

City of Portland Bicycle Master Plan

The City of Portland Bicycle Master Plan was adopted in 1996 following an extensive citizen involvement process. The purpose of the Bicycle Master Plan is to establish a 20-year framework for changes that will substantially improve the bicycling environment in Portland. The Plan includes bicycle policies, benchmarks, a recommended bikeway network, discussion of end-of-trip facilities, design guidelines, a list of capital projects, and other strategies to encourage bicycling. The TSP updates the policies of the Bicycle Master Plan. Elements of the Bicycle Master Plan are discussed in other parts of this modal plan.

City of Portland Comprehensive Plan

The City of Portland's Comprehensive Plan contains general statements that guide how the City plans and implements improvements. In addition, a number of district and neighborhood plans have been adopted that also contain more area-specific statements. These statements are ordered from the general to the specific as goals, policies, objectives, and action items. Goals, policies, and objectives are formally adopted by City Council ordinance.

The Comprehensive Plan addresses a broad range of goals for the City. Most policies relating to transportation are found in the Transportation Element of the Comprehensive Plan, which encompasses Goal 6, Transportation, Goal 11B, Public Rights-of-Way, and the Central City Transportation Management Plan. The Transportation Element has been completely rewritten as part of the TSP. The Goal 6, Goal llB, and CCTMP policies are summarized below. The full text for each can be found in Chapter 2 of the TSP.

Goal 6 Transportation
The policies and objectives within Goal 6 that relate to bicycle transportation are primarily under Policy 6.23, which states:

> Make the bicycle an integral part of daily life in Portland, particularly for trips of less than five miles, by implementing a bikeway network, providing end-of-trip facilities, improving bicycle/transit integration, encouraging bicycle use, and making bicycling safer.

The objectives for Policy 6.23 address:

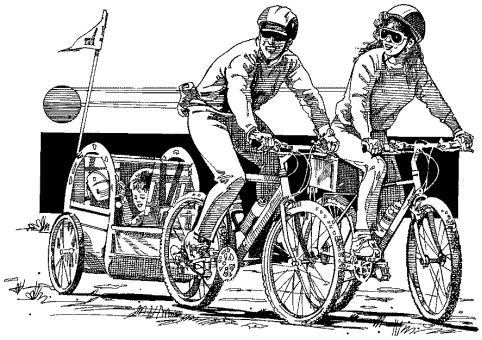
A. Completing a network of bikeways

B. Providing continuous bicycle facilities

C. Installing bicycle signage

D. Increasing bicyclist safety and convenience

E. Providing short-term and long-term bicycle parking



F. Encouraging the provision of showers and changing facilities

G. Increasing the number of bicycle/transit trips

H. Promoting bicycling as safe and convenient transportation to and from school

Policy 6.7 provides three bikeway classification descriptions – City Bikeway, Off-Street Path, and Local Service Bikeway.

- The City Bikeway classification describes appropriate land use, facility design, improvements, on-street parking, and bicycle parking that are typical of or should be made in conjunction with City Bikeways.

- The Off-Street Path classification describes its function as a connection or short-cut to other bikeways and destinations, where Off-Street Paths should be located, and how the paths should be improved.

- The Local Service Bikeway classification describes all other streets not classified as City Bikeways or Off-Street Paths as local and describes the appropriate level of bicycle improvements, the priority of on-street parking, and how the street should operate for bicycles.

The bikeway classifications are shown on the maps for each of the city's seven Transportation Districts, located under policies 6.34 through 6.40 in Chapter 2 and following the policies for CCTMP (for that district). These designated bikeways are adopted as part of the Comprehensive Plan.

In addition to these policies and objectives, other bicycle-related objectives in Goal 6 are:

- Develop and implement education and encouragement plans aimed at youth and adult cyclists and motorists. (Policy 6.3,Transportation Education, Objective D)

- Increase public awareness of the benefits of walking and bicycling and of available resources and facilities. (Policy 6.3,Transportation Education, Objective E)

- Provide interconnected local and collector streets to serve new development and redeveloping areas and to ensure safe, efficient, and convenient pedestrian, bicycle, and vehicle access with preference for public streets. (Policy 6.20, Connectivity, Objective A)

- Provide convenient and safe bicycle and pedestrian connections to transit routes, schools, and parks, as well as within and between new and existing residential developments, employment areas, and other activity centers where street connections are not feasible. (Policy 6.20, Connectivity, Objective C)

- Evaluate opportunities and the existing and future need for a bikeway, walkway, or other transportation use when considering vacation of any right-of-way. (Policy 6.21, Rights-of-Way Opportunities, Objective A)

- As a condition of street vacation, require pedestrian and bicycle facilities if needed. Give first preference to a dedicated right-of-way and second preference to a public walkway and bikeway easement. (Policy 6.21, Rights-of-Way Opportunities, Objective B)

DISTRICT BICYCLE-RELATED OBJECTIVES

District-specific objectives addressing bicycle access and infrastructure improvements are contained in Policy 6.34 through Policy 6.40 for the seven Transportation Element Districts: North, Northeast, Far Northeast, Southeast, Far Southeast, Northwest, and Southwest. The CCTMP also includes policies and objectives for bicycles. Selected objectives are listed below; the complete text of district policies and objectives is provided in Chapter 2.

- North – Consider extension of the Willamette Greenway Trail south from its current designation that ends at N Edgewater and connecting to the trail on Swan Island, following the outcome of a feasibility study. (Policy 6.35, Objective L)

- Northeast – Continue to develop east/west and north/south bicycle routes, both on-street and off-street, to connect with existing bikeways (including those on East Burnside and I-205) and with work, school, commercial, and recreational destinations. (Policy 6.36, Objective G)

- Far Northeast – Improve the designated bicycle network and connect major routes to routes in adjacent districts and jurisdictions. (Policy 6.37, Objective C)

- Southeast – Improve access and safety for bicycles through the development of more inner Southeast east/west bike routes and the provision of bicycle facilities across bridges and to a variety of destinations, including downtown, the river, and parks. (Policy 6.38, Objective E)

- Far Southeast – Accommodate bicyclists and pedestrians along arterials and at crossings, especially at activity nodes, through a combination of street and traffic management improvements. (Policy 6.39, Objective C)

- Northwest – Incorporate pedestrian and bicycle access improvements into all transportation projects, especially along arterials and at crossings. (Policy 6.40, Objective C)

- Southwest – Consider designation of a 'Red Electric Line' alignment for pedestrians and bicyclists, as identified in the Southwest Urban Trails Plan, upon completion of a feasibility study. (Policy 6.41, Objective C)

Goal 11B Public Rights-of-Way

Goal 11B, Public Rights-of-Way, and its policies and objectives describe how the City's transportation system should be designed and built. Bicycle-related objectives under Goal 11B include:

- Promote a compact urban form by supporting development in high-priority 2040 Growth Concept areas, including facilities and improvements that support mixed-use, pedestrian-friendly development and increase walking, bicycling, and transit use. (Policy 11.8, Project Selection, Objective A)

- Address existing deficiencies or hazards by improving pedestrian, bicycle, and vehicular safety. (Policy 11.8, Project Selection, Objective B)

- Use a variety of transportation resources in developing and designing projects for all City streets, such as the City of Portland's Pedestrian Design Guide, Bicycle Master Plan, and Design Guide for Public Street Improvements. (Policy 11.10, Street Design and Right-of-Way Improvements, Objective E)

- Provide planned bicycle facilities in conjunction with street improvements, or develop convenient alternative access for bicycles on parallel streets, when the appropriate bikeway facility cannot be provided on the designated street because of severe environmental or topographical constraints, unacceptable levels of traffic congestion, or the need to retain on-street parking. (Policy 11.10, Street Design and Right-of-Way Improvements, Objective F)

- Provide bike and pedestrian connections at approximately 330-foot intervals on public easements or rights-of-way when full street connections are not possible, except where prevented by barriers such as topography, railroads, freeways, or environmental constraints. (Policy 11.11, Street Plans, Objective E)

Central City Transportation Management Plan (CCTMP)

In July 1993, a bicycle transportation study was conducted as part of the CCTMP. The study identified the factors that encourage or discourage people from commuting by bicycle to and from the Central City and focused on how to support bicycling as a serious mode of transportation. The study's findings are addressed by the CCTMP bicycle policies and action items.

The CCTMP also describes the functional purpose of Central City Bikeways and the desired design treatment and traffic operations of these bikeways. In general, Central City Bikeways are "intended to provide safe, direct, and convenient access between and within transportation districts and sub-districts." To accommodate bicycles on Central City Bikeways, suggested roadway modifications include:

- Reduction of mixed-use travel lane widths

- Reduction in the number of mixed-use travel lanes

- Relocation of transit stops where transit operations are not negatively impacted

- Removal of on-street parking except where it is determined to be critical to adjacent land uses

- Measures to reduce traffic volume or speed

Bicycle policies specific to the Central City address bicycle mode split, trip-end facilities, bicycle access, and improvements to the bicycle network and connections. These policies and their associated action items were adopted as part of the Central City Transportation

Management Plan in 1995. The complete text of the policies and objectives is contained in Chapter 2.

Other Bicycle-Related Policies and Objectives
In addition to the Transportation Element, the following Comprehensive Plan objectives address bicycle transportation.

Economic Development Goal, Policy 5.4, Transportation System, Objective E, states:

> Promote safe and pleasant bicycle and pedestrian access to and circulation within commercial areas. Provide convenient, secure bicycle parking for employees and shoppers.

Energy Goal, Policy 7.6, Energy Efficient Transportation, states, in part:

> Provide opportunities for non-auto transportation including alternative vehicles, buses, light rail, bikeways, and walkways. . .

Energy Goal, Policy 7.6, Energy Efficient Transportation, Objective H, states:

> Promote walking and bicycle commuting by developing bikeways and walkways, encouraging spot hazard improvements on City streets, providing bicycle lockers at transit centers and park-and-ride lots, implementing bicycle commuter services such as long-term bicycle parking, showers, and changing facilities, and promoting covered walkways/sidewalks.

Environment Goal, Policy 8.4, Natural Resources, Objective H states:

> Enhance the value and beauty of Portland's bicycle and pedestrian routes by locating them to take advantage of significant viewpoints, scenic sites, and scenic corridors.

Most district and neighborhood plans have policies and/or objectives that address bicycle transportation. Typically, these plans focus on the need for safe and convenient bicycle access to neighborhood destinations such as schools and parks and on providing signage on designated routes.

Existing Conditions

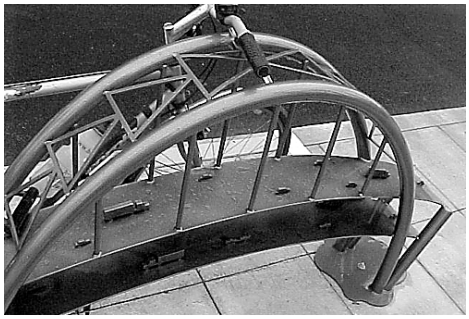
Summary of Inventory

Bicycle Lanes, Bicycle Boulevards, and Paths
As of October 2001, there were approximately 146 miles of bicycle lanes, 27 miles of bicycle boulevards, and 55 miles of off-street paths in the City of Portland.

The City has also planned and funded an additional 16 miles of bicycle lanes, 11 miles of off-street paths, and 1.4 miles of bicycle boulevards, to be implemented by the end of 2001. An additional 24.6 miles of "signed connections" will be identified when bicycle route signs are installed.

End-of-Trip Facilities

New short-term bicycle parking the public right-of-way in the River District.



BICYCLE PARKING

Throughout the Central City, there are more than 1,500 City-installed short-term parking spaces (mostly on sidewalks), 300 privately installed short-term spaces, over 700 long-term spaces, and 290 additional long-term spaces in the form of bicycle lockers. Unfortunately, many spaces intended for long-term parking (not including bicycle lockers) do not comply with existing City Code and do not provide adequate security.

Outside the Central City are approximately 600 City-installed short-term spaces. According to a 1995 bicycle parking survey of all of Portland's commercial and industrial districts outside the Central City, total bicycle parking amounts to only 3 percent of available off-street automobile parking (less than the City Code requirements of 5 percent). Municipal buildings provide the most bicycle parking (9 percent of off-street automobile parking) and office buildings and retail businesses provide the least (2 to 3 percent of off-street automobile parking).

Bicycle parking at light rail stations, transit centers, and park-and-ride lots is essential for improving the bicycle/transit link. As of 1996, bicycle lockers had been installed at park-and-ride lots, light rail stations, and transit centers. These include:

- 4 lockers, 6 bike lids, and 10 rack spaces at Gateway Regional Center
- 4 lockers and 6 rack spaces at 60th Avenue
- 4 lockers and 3 rack spaces at Rose Quarter
- 3 bike lids and 4 rack spaces at Civic Stadium
- 4 lockers and 14 rack spaces at Washington Park
- 4 lockers, 2 bike lids, and 8 rack spaces at 122nd Avenue station area
- 4 lockers and 4 rack spaces at Barbur Boulevard
- 8 lockers and 5 rack spaces at Hollywood Transit Center

The City provides long-term bicycle parking in 170 locker spaces throughout the Downtown core.

SHOWERS AND CHANGING FACILITIES FOR COMMUTING CYCLISTS

As of February 2001, publicly accessible showers and changing facilities were provided at four City-sponsored 'bike central' locations: Lloyd Athletic Club, Riverplace Athletic Club, Princeton Athletic Club, and Commonwealth Fitness Club. Commuting cyclists are also served by showers and changing spaces at their workplaces. The zoning code awards bonus floor area to buildings in the Central City that provide locker rooms and showers that are available for employees and additional long-term bicycle parking.

Existing Deficiencies

Bicycle/Motor Vehicle Crashes

On average, approximately 160 bicycle/motor vehicle crashes per year are reported in Portland, with the number of crashes decreasing since 1987 and leveling off since 1990 (ODOT Bicycle-Motor Vehicle Crash Summaries, 1987-1994). Most of these crashes occurred at intersections, resulting from both motorist errors (30 percent of total crashes) and cyclist errors (21 percent of total crashes). Other causes were bicyclists traveling against the flow of traffic (11 percent) and bicyclists or motorists entering or leaving mid-block (12 percent and 9 percent, respectively).

Collision data from January 1996 through December 1998 also show that nearly all crashes over this period (nearly 72 percent) took place at an intersection. There are no particular locations where collision rates are high. This indicates that intersections in general provide the most dangerous riding conditions for bicyclists.

Many potential bicyclists cite the fear of traffic as their main objection to riding a bicycle on urban streets. The City can help alleviate this fear by providing good bikeway facilities. All streets (other than limited access facilities such as freeways) should be accessible by bicycle, with the appropriate bicycle facility based on the street's classification, motor vehicle traffic speed and volume, and the street's presence on Portland's bikeway network (see Table 5.8). The type of facility may be a bicycle boulevard, separate bicycle lanes, or a wider shared outside lane.

End-of-Trip Facilities

The provision of adequate short-term bicycle parking continues to vex planners and cyclists alike, particularly in the City's urban core where lot-line to lot-line developments make it difficult to easily site bicycle parking within fifty feet of building entrances, as required by Title 33 of the City Code. Often, required bicycle parking at newly-constructed development is located in parking garages. Though this is allowed by Title 33, which states that short-term bicycle parking can be sited "inside a building, in a location that is easily accessible for bicycles," the result is bicycle parking that is difficult to reach and not clearly visible to potential users. Title 33 also requires signage to be placed at main entrances if bicycle parking is not visible from the main entrance, but property owners and managers frequently do not want to do this.

Issues from District Needs Assessment

In fall 1998, PDOT held TSP workshops in each of the Transportation Districts to gather information about transportation issues and community needs. Participants were asked to identify needed transportation improvements in their neighborhood and indicate their top three priority issues, or 'transportation values.'

Three of the top seven values identified in the workshops relate directly to bicycle travel: safety and livability on local streets; greater connectivity; and more transportation choices. Increasing safety and livability was especially important in the Northwest, North, Northeast, and Southwest Districts. Improving connectivity was especially important in the Far Northeast, Southwest, and Far Southeast Districts. Providing more transportation choices was one of the top priorities in the Southeast District.

Bicycle Master Plan

Portland's Bicycle Master Plan was developed from 1994 to 1996, with input from over 2,000 residents, including neighborhood activists, business people, parents, educators, regular cyclists, and individuals wishing to bicycle—both for the first time and more frequently. Additional input came from staff of the Portland Office of Transportation (PDOT); Tri-Met; the Port of Portland; Multnomah, Washington, and Clackamas Counties; Metro; the Oregon Department of Transportation (ODOT); and the Portland Bureaus of Planning and Parks. The plan was adopted by City Council Resolution No. 35515 on May 1, 1996.

The plan provides guidance over a 20-year period for improvements that will encourage more people to ride more frequently for daily needs. The goal is to make bicycling an integral part of daily life in Portland. In addition to the policies and objectives of Portland's Comprehensive Plan Transportation Element, the Bicycle Master Plan addresses four key elements:

- Developing a recommended bikeway network
- Providing end-of-trip facilities
- Improving the bicycle/transit link
- Promoting bicycling through education and encouragement

The plan also includes bikeway design and engineering guidelines. It addresses bikeway classifications, as well as bicycle policies and strategies for the Central City Transportation Management Plan (CCTMP).

The TSP is intended to balance the implementation of Bicycle Master Plan elements with the improvements needed to serve all other modes.

Recommended Bikeway Network

National and local polls frequently cite the lack of bikeways as the primary reason more people do not bicycle for daily trips. This is also the case in Portland, where 88 percent of those surveyed in 1994 stated that lack of bikeways prevented more frequent cycling. In addition, the survey identified bicycle lanes as the most desirable type of bikeway facility (49 percent), with bicycle boulevards and off-street paths also considered important (35 and 18 percent, respectively).

The Bicycle Master Plan recommends streets and paths as bikeways, based on their connection to land uses, ease of implementation, need for safety improvements, lack of parallel facilities, and/or need for continuity. The objectives and action items in the plan are intended to result in a comprehensive, continuous, and well-maintained bikeway network that will maximize the benefits of bicycling to both Portland's cycling and

non-cycling public. Table 5.9 below shows under what circumstances the types of bikeway facilities are appropriate on streets with specific classifications. For instance, striped bicycle lanes are usually not needed on Local Service Streets.

Table 5.9
Guidelines for Selecting Bikeway Facilities

Average vehicles/day	Transportation Element Street Classification	Recommended Bikeway Facility
≤ 3,000	Local Service Street	Street as is, unless specified otherwise on bikeway network.
> 3,000	Local Service Street	Bicycle lanes. Where not possible, traffic calming improvements or wide outside lane acceptable.
≥ 3,000 but < 10,000	Neighborhood Collector; Community Transit	Bicycle lanes. Where not possible, traffic calming improvements or wide outside lane acceptable.
≥ 10,000 but < 20,000	Neighborhood Collector; District Collector; Traffic Access Street; Major City Traffic Street; Major Transit Priority Street; Transit Access Street; Community Transit; Major Truck Street; Minor Truck Streets	Bicycle lanes. Where not possible, wide outside lane acceptable.
≥ 20,000	Neighborhood Collector; District Collector; Traffic Access Street; Major City Traffic Street; Major Transit Priority Street; Transit Access Street; Major Truck Street; Minor Truck Street	Bicycle lanes. Where not possible, a parallel alternative facility should be developed.

End-of-Trip Facilities

End-of-trip facilities consist of bicycle parking, showers, and changing space for bicycle commuters and are an essential component of bicycle travel. Based on the results of a nationwide Harris Poll conducted in 1991 and a 1992 Portland bicycle user survey, the availability of end-of-trip facilities is a critical factor in deciding whether or not to commute by bicycle.

Good, secure bicycle parking offers the following benefits:

- Inexpensively and efficiently increases a building's parking capacity
- Serves those who use bicycles as a mode of transportation
- Encourages bicycle use

The type of facilities needed (from simple street furniture to secure bicycle lockers and gear storage space) varies, according to the following factors:

- The type of trip being made; whether the bicycle will be left unattended all day or for a short time.
- Weather conditions. Covered bicycle parking is likely to be of greater importance during the wetter months.
- The value of the bicycle. The more a cyclist has invested in a bicycle, the more concern she or he will show for theft protection.
- Security of the area. This is fairly subjective, determined by cyclists' perception of how prone the area is to bicycle theft and their own experiences with bicycle theft.

Bicycles and Transit

Linking bicycles with mass transit (bus and rail) addresses the barriers of lengthy trips, riding at night, inclement weather, and steep topography. This linkage enables bicyclists to reach distant areas and can increase transit ridership on weekends and midday. Bicycling to transit decreases the amount of land and funds consumed by expansive park-and-rides, and reduces air pollution, energy consumption, and traffic congestion.

Bicycle/transit integration has four main components:

- Allowing bicycles on transit
- Offering bicycle parking at transit locations
- Improving bikeways to transit
- Encouraging usage of bicycle and transit programs

Education and Encouragement

Education is an important element in increasing bicycling and improving safety. While the most immediate way to improve the safety of cycling is to improve the quality of Portland's bikeway facilities, bikeways cannot do it alone. There is also a need for proper education of both youth and adult cyclists and motorists.

The Bicycle Master Plan addresses three education components:

- Developing safe cycling skills in children
- Teaching adult cyclists their rights and responsibilities
- Teaching motorists how to more effectively share the road with cyclists

Bikeway Design Guidelines

The Bicycle Master Plan outlines bicycle facility design practices and standards, based on the American Association of State and Highway Transportation Officials' (AASHTO) manual, "Guide for the Development of Bicycle Facilities 1991," with supplementary material from ODOT's 1996 ODOT "Oregon Bicycle and Pedestrian Plan."

Implementation Measures

Summary of Existing Regulations

All new development, changes to existing development, and changes in the type or number of uses must comply with the zoning regulations in the City Code. Title 33, Planning and Zoning, has the most consequence for the bicycle mode. Other bicycle-related regulations are found in Title 16, Vehicles and Traffic, and Title 17, Public Improvements. These regulations are intended to implement the goals and policies of the Comprehensive Plan. Modifications or adjustments may be made to the regulations if a site is difficult to develop in compliance with the regulations and the proposed development meets the intended purpose of those regulations, or when strict application of the regulations would prevent all use of a site.

Title 33
In multi-dwelling residential, commercial, employment, and industrial zones, standards are generally intended to provide onsite circulation, bicycle parking, and access to bicycle amenities.

ADDITIONAL USE AND DEVELOPMENT REGULATIONS
Additional use and development regulations intended to encourage the use of bicycles include:

- Parking and loading standards, which ensure adequate short-term and long-term bicycle parking based on the demand generated by the use category and the level of security necessary.

- Superblocks standards, which require that developments on superblocks provide walkways within the block and that these walkways be accessible to bicycles (or provide an alternative connection), hard surfaced, and lighted.

PLAN DISTRICTS
Plan districts modify the regulations of the base zone in a variety of areas identified on the City's official zoning maps. Plan districts with bicycle provisions include Cascade Station/Portland International Center (CS/PIC), Central City, Gateway, and Hillsdale. Special bicycle regulations generally consist of one or more of the following: bicycle parking and other end-of-trip facilities, bicycle connections between buildings and to transit, overall accessibility, and use restrictions. The Central City Plan District also offers a floor area bonus for projects in commercial and employment zones that provide locker room facilities and extra long-term bicycle parking.

Title 16
Title 16 contains bicycle-riding regulations for Portland. It includes operating rules, rules on impounding bicycles, and rules on renting bicycles. Title 16 also regulates roller skates, skateboards, and scooters.

Bicycle Design Guidelines
The standards address the type of bicycle facility to be implemented (off-street path, bicycle lane, bicycle boulevard, or shared roadway), based on a street's classification and motor vehicle traffic speed and volume. They also specify guidelines for each type of facility, intersections, and miscellaneous design elements. Appendix A of the Bicycle Master Plan contains the detailed engineering and design guidelines.

Oregon Revised Statutes
ORS 366.514 mandates the expenditure of funds for bicycle and pedestrian facilities when roads are being 'constructed, reconstructed, or relocated' using state highway funds. Not less than one percent of the total amount of highway funds received must be spent on bicycle and pedestrian facilities.

Oregon Vehicle Code
The Oregon Vehicle Code regulates bicyclists (and motorists when bicycles are present) in several ways. The regulations address failure of motorists to yield to bicyclists, vehicle laws that pertain to bicyclists, and vehicle equipment requirements, including the bicycle helmet law. The Bicycle Master Plan contains the complete text of the state regulations and Title 16 regulations.

New Regulations

Title 33
Potential changes to Title 33 regulations for bicycles include clarifying where short-term bicycle parking can be located. Currently, short-term bicycle parking can be located inside buildings if the location is easily accessible to bicycles. Short-term bicycle parking in garages or other automobile storage areas is problematic because the parking is frequently not under observation, making the bicycles more easily stolen, and because more conflicts between bicyclists and motorists are likely to occur. The potential revisions to the regulations relating to the location of short-term bicycle parking will be examined through a separate process.

A change is being made to long-term bicycle parking regulations. Currently, long-term parking can be located within 750 feet offsite. In areas with large blocks, measuring the distance 'as the crow flies' sometimes means the bicyclist has to walk much further than 750 feet. Within the Central City, with its generally tight grid, 750 feet is a reasonable measurement. Outside the Central City, where block sizes vary greatly and the pedestrian environment is less complete, it may not be reasonable to allow offsite long-term bicycle parking. Amendments to the bicycle parking regulations will reduce the distance from 750 feet to 300 feet (the same distance that required automobile parking is allowed to be from a site).

Title 17
In areas of the City with storefront and/or lot-line to lot-line development, typically no room is provided on private property for the installation of convenient, short-term bicycle parking. Including short-term bicycle parking as a part of frontage improvements required by Title 17 will increase the supply of convenient bicycle parking over time. In the Central City, three short-term bicycle parking racks can be accommodated on each block face. The number of racks will vary by length of block face and sidewalk constraints (i.e., only in sidewalks that

are at least ten feet in width. A new development standard will describe where and how the bicycle racks will be placed within the right-of-way. This standard will be applied similarly to how street trees and street lighting are required. The intent is that bicycle parking will be placed on block faces that have building main entrances.

Programs and Strategies

Bicycle parking for PGE Park replaces a few spaces of on-street auto parking.

Bicycle Promotions

PDOT continues to fund a bicycle coordinator position within Transportation Planning. The Transportation Options division funds other activities associated with promoting bicycle use, including managing the bicycle locker program, managing bicycle signing projects, soliciting funding for bicycle projects, advising on and monitoring transportation plans and projects, and conducting bicycle rides. Encouraging bicyclists to bike to events can reduce congestion and reduce the demand for automobile parking as it did for Bike to the Ballpark Day at PGE Park in August 2001 (at right).

Education and Encouragement

Encouragement goes hand-in-hand with education to increase cycling. Together, they improve skills and raise awareness. Encouragement includes such measures as providing a bikeway network and associated facilities (bicycle parking, network signing), holding encouragement events, providing financial and non-financial incentives, providing information about cycling routes, sponsoring group rides, and other bicycle-related activities. PDOT's Transportation Options section implements these activities.

Bicycle/Transit Integration

Tri-Met manages most of the aspects related to bicycle/transit integration, but PDOT staff help Tri-Met's efforts by promoting bicycle/transit services and providing bikeways to transit stations. The Bicycle Transportation Alliance, a local bicycle advocacy group, assists by administering bicycle locker rental at transit centers.

The City currently administers a bicycle locker program n the Downtown core, providing secure and weather-protected long-term bicycle parking to area students, workers, and residents. This locker rental program charges a month user fee of $10 with a refundable $25 key deposit. The program operates at capacity during much of the year, with an occupancy rater of approximately 90 percent during the winter months.

Bicycle Projects

TSP Major Transportation Improvements

Some of the significant bicycle improvements identified in the TSP Major Improvements List include (not in order of importance or funding priority):

- Bike lanes on SE Foster between SE 136th and the City limits in conjunction with other street improvements (Project No. 80011)

- Bike lanes on SE 92nd between SE Stark and Lincoln in conjunction with other street improvements (Project No. 70060)

- Bike lanes on NE Cully between NE Prescott and Columbia in conjunction with other street improvements (Project No. 40037)

- Bike lanes on SE 174th between SE Stark and the City limits in conjunction with other street improvements to SE 174th/Jenne Road and the intersection with SE Powell (Project No. 80007)

- Bike lanes on SE Holgate between SE 42nd and the City limits (Project Nos. 70032 and 70033)

- SW Sunset between SW Capitol and Dosch in conjunction with other improvements to City standards (Project No. 90063)

- NW and SW Naito Parkway improvements, including bike lanes between NW Davis and SW Market (Project No. 20038)

- Signed bikeway connection on N Force/Broadacre/Victory to the I-5 river crossing (Project No. 30011)

Chapter 3 contains the complete list of TSP projects (although not sorted by mode).

Many of the projects in the TSP planned for construction over the next 20 years incorporate multimodal design elements that will enhance bicycle transportation. Projects that result in the redesign of existing streets or structures, or provide new streets, often improve bicycle access. Other transportation projects such as traffic signals and turn lanes, may also benefit bicycle movement and safety. Maintenance activities such as pavement overlays provide an opportunity to include new bicycle features such as bike lanes.

Other Bicycle Projects

Many of the bicycle projects identified through the needs assessment process do not qualify as 'significant planned improvements' in the TSP, but are still important to improving the bicycling environment. In addition to the projects listed on the Major Transportation Improvements List, many bicycle improvements are implemented as a part of Reference List categories. Chapter 3 describes how the projects were placed in each of these two project lists. The Bicycle Master Plan is the primary source for both major bicycle improvements such as those listed above, as well less expensive bicycle projects. Appendix E lists all of the Bicycle Master Plan projects. These smaller projects are funded through a variety of sources, including the Capital Improvement Program. See Chapter 14 in Volume II for more details on funding.

Conclusion

The bicycle is an essential component in our efforts to develop a multi-modal transportation system and reduce our reliance on the automobile. No longer considered an 'alternative' means of travel, it plays an important role as a legitimate transportation choice. This view is also supported by regional and state policies such as Oregon's Transportation Planning Rule and Metro's 2000 Regional Transportation Plan. The City of Portland is committed to making the bicycle a safe, efficient, and desirable mode of travel and an integral part of daily life.

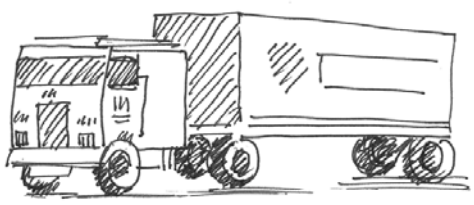
City-sponsored rides encourage new riders to explore their neighborhoods and practice good bicycling habits.

FREIGHT MODAL PLAN

Introduction

The confluence of important geographic elements make Portland one of the largest and most important freight distribution centers on the West Coast:

- Two navigable rivers, Columbia and Willamette, providing access from hundreds of thousands of fertile inland acres (barge)
- Proximity and ease of access to the Pacific Ocean coast and the Pacific Rim countries beyond (ship)
- Relatively flat and accessible north-south access via I-5 and the Burlington Northern, and Santa Fe Railroads (truck/train)
- Relatively flat and accessible east-west access via I-84 and the Union Pacific Railroad (truck/train)



- A rapidly growing air/freight industry (airplane)

The efficient movement of freight, including hazardous substances, through and within the City is critical to Portland's economic well-being. Trucking is the most frequently used, versatile, and often most efficient means of movement. Whether as a beginning or interim step in distribution, or as a final delivery to a retail outlet or end user, trucking will continue to be the way most goods and products move within the City and region.

Trucks are subject to most of the same traffic constraints as other vehicles. With vehicle miles of travel increasing more rapidly than miles of roadway, congestion (especially during peak travel hours) will worsen in the future. Travel times will increase, encouraging truckers to look for alternate, and potentially inappropriate, routes to their destinations. Although absolutely necessary to retail/commercial businesses, truck deliveries and loading practices can also have adverse impacts.

Potential truck freight conflicts with the quality of life in urban situations include:

- Late night deliveries (light, noise, vibration)
- Peak-hour deliveries (congestion, traffic interference)
- Movement of hazardous substances (safety)
- Through-trucks on neighborhood or retail commercial streets (noise, vibration, intimidation, safety, inappropriate use of street capacity)
- Loading operations (noise, aesthetics)

- On-street loading (traffic or access interference)

The most efficient way to prevent inappropriate truck traffic, on neighborhood streets or elsewhere, is to provide a system of safe, efficient, and convenient truck routes within truck districts, between industrial districts, and to intermodal terminals and truck loading areas. Improvements that reduce delays and barriers on the designated routes are needed to maintain efficient truck freight movement.

Freight movement by air, water, and rail does not require accommodation in the street right-of-way. Each of these modes is, for the most part, separate from other modes of transportation, except at intermodal terminals where freight loads are interchanged and at street and rail right-of-way intersections. Non-truck modes of freight movement are also regulated differently, with the state and federal governments having most regulatory responsibility for air, water, and rail freight. Because these modes have different needs from truck freight, they are addressed separately in this chapter under the Air, Rail, Water, and Pipeline Modal Plan.

Requirements

Transportation Planning Rule

In addition to the common elements that must be included in each of the modal plans (as described on page 5-2), the state Transportation Planning Rule (TRP) contains the following elements specific to trucks and freight:

OAR 660-12-030, (1) (c): Determination of Transportation Needs, requires the "movement of goods and services to support industrial and commercial development."

The movement of hazardous substances is a special consideration within freight movement. The state Transportation System Planning Guidelines recognize this special need by recommending that transportation system plans include a 'Truck Route Plan – Hazardous Materials Routes' as a functional consideration in street design requirements.

2000 Regional Transportation Plan

Metro's role is to identify the regionally significant freight system and intermodal facilities, coordinate planning for the system, and make sure that adequate land is available for expansion of intermodal facilities, manufacturing, wholesale, and distribution activities. The 2000 Regional Transportation Plan (RTP) includes two freight-related policies and a number of objectives. The RTP requires Portland to be consistent with these RTP policies and classification maps.

RTP Policy 15.0, Regional Freight System, focuses on providing an "efficient, cost-effective and safe movement of freight in and through the region." The objectives address providing access between the freight corridors and intermodal facilities and industrial sanctuaries, maintaining reasonable travel times for freight movement, coordinating planning activities for regional freight corridors, and correcting safety deficiencies.

Policy 15.1, Regional Freight System Investments, focuses on protecting and enhancing "public and private investments in the freight network." Its objectives address opportunities for partnerships and funding for freight mobility investments.

The RTP identifies freight corridors and intermodal facilities. Table 5.10 compares the freight classifications in the RTP, Portland's Transportation System Plan (TSP), and Central City Transportation Management Plan (CCTMP).

Table 5.10
Comparison of Freight Classifications

2000 RTP Classification	TSP Classification
Industrial Area	Freight District*
Main Roadway Route	Regional Truck Street
Road Connector	Major Truck Street/Minor Truck Street
Not mapped	Local Service Truck Street
Marine Facility, Air Cargo Facility, Railroad Facility, Intermodal Railyard	Freight Facility
Truck Terminal, Distribution Facility	Not mapped
Main Railroad Line	Main Rail Line
Branch Railroad Line	Not mapped

Note: Within Freight Districts, streets are not separately identified, except for Regional Truck Streets and Major Truck Streets that form a boundary of a Freight District.

The City's freight classifications relate to the RTP freight classifications as follows:

- The City's Regional Truck Streets, for truck freight trips "with one or no trip ends within a City of Portland Transportation District," coincide with state and federal highways (I-5, I-84, I-205, I-405, US 26, US 30, 99W, 99E). These highway routes, in turn, coincide with the RTP's Main Roadway Routes.

- Many of the City's arterials, or portions of those arterials, serve as Major Truck Streets, "with one or both trip ends in a Transportation District." Included in this category are: Interstate, Going, St. Helen's Road/US 30, Grand/Martin Luther King, Jr., Portland, Killingsworth, 82nd, 102nd, 122nd, Stark/Washington, Jefferson/Canyon, Hawthorne, Powell, Holgate, Macadam, Barbur, Capitol, Beaverton-Hillsdale, Front, Arthur, Sheridan, 4th, 5th, and Kelly. These arterials are classified in the RTP as Road Connectors.

Potential Consistency Issues with the RTP Freight Classifications

TERMINALS, RAILROAD BRANCH LINES, DISTRIBUTION FACILITIES

Portland has inventoried, but not mapped, truck terminals, distribution facilities, and branch rail lines other than the major facilities. These are minor facilities whose location may change over time without impacting the freight system.

FREIGHT DESIGNATIONS IN FREIGHT DISTRICTS

For purposes of Portland's TSP, all streets in Freight Districts are 'truck streets' available for the movement of trucks. The Freight Districts only call out Regional Truck Streets that go

through or are at the boundary and Major Truck Streets that form a boundary of a district. The traffic and street design designations within Freight Districts determines the hierarchy of streets for design and the movement of motor vehicles, including trucks.

WATER AVENUE ON-RAMP (CENTRAL EASTSIDE INDUSTRIAL DISTRICT)
The project for the Water Avenue on-ramp is included in the RTP as Project No. 1026 – Water Avenue Ramps on I-5. It is described as "Construct new freeway access from the Central Eastside Industrial District to I-5." This project has the potential for substantial environmental impacts and limited benefits given the large costs. The City does not support the project and believes that alternatives exist which would address the access issues addressed by the project. See the discussion on page 5-10 for the alternative projects.

Approach To Mode

Consistent with the themes for the TSP, Portland's approach to truck freight mobility and access is:

- Manage the road system to provide for and further the objectives of truck freight mobility and access contained in the Portland Comprehensive Plan, the Portland Regional Framework Plan, and the Regional Transportation Plan.
- Recognize the contributions that freight movement and distribution make to the economic well being of the City.
- Minimize conflicts between truck freight and residential or retail/commercial activities.

The objectives of the Freight Modal Plan are to:

1. Support and implement the Federal and National Highway Plans as they apply to freeways and other designated federal truck routes or connectors.
2. Support and implement the Oregon Highway Plan on freeways and other designated state routes.
3. Support and implement the Regional Transportation Plan on roadways of regional significance.
4. Enhance truck access to intermodal facilities and within designated Freight Districts.
5. Define locations and conditions where the needs of commercial vehicles and freight movement will be emphasized in the operation of the roadway system.
6. Build public and private partnerships to support the maintenance and development of public infrastructure for truck freight.

Definitions

Truck Freight

The City of Portland defines truck freight movement as the movement of heavy and medium trucks. Because light commercial trucks cannot be distinguished from private vehicles, they are not included.

Heavy Truck: Container

Medium trucks include trucks with two to four axles, and two-axle trucks with six tires. Heavy trucks include all articulated trucks, trucks with one to three trailers, and/or

with three to nine axles.

Hazardous Substances

The movement of hazardous substances is included within truck freight movements. Hazardous substances are defined by the U.S. Department of Transportation in the Code of Federal Regulations (CFR), Title 49, Parts 100 to 177 (October, 1983), and by the City of Portland in the Planning and Zoning Code, Chapter 33.910, Definitions.

The Oregon Department of Transportation (ODOT) prohibits the movement of hazardous substances where there is a potentially increased hazard for truck movement, humans, or the environment at a specific location. Hazardous substances are directed away from the I-26 tunnel leading into downtown Portland, and the at-grade railroad crossing parallel to U.S. Route 30, near Balboa Street.

Policy Framework

City of Portland Comprehensive Plan

The City of Portland's Comprehensive Plan contains general statements that guide how the City plans and implements improvements. In addition, a number of district and neighborhood plans have been adopted that contain more area-specific statements. These statements are ordered from the general to the specific as goals, policies, objectives, and action items. Goals, policies, and objectives are formally adopted by City Council ordinance.

The Comprehensive Plan addresses a broad range of goals for the City. Most policies relating to transportation are found in the Transportation Element of the Comprehensive Plan, which comprises Goal 6, Transportation; Goal 11B: Public Rights-of-Way; and the Central City Transportation Management Plan. The Transportation Element has been completely rewritten as part of the TSP, and the truck and freight-related policies and objectives are identified below on pages 5-114 through 5-115. These policies emphasize the efficient movement of trucks and the protection of residential and commercial areas from inappropriate truck traffic.

Goal 6 Transportation

Policies and objectives within Goal 6 that relate to freight and truck movement are primarily under Policy 6.9, Freight Classification Descriptions, Policy 6.29, Freight Intermodal Facilities and Freight Activity Areas, and Policy 6.30, Truck Movement. (The complete text of these policies is contained in Chapter 2.)

Policy 6.4, Classification Descriptions, describes how the classification descriptions and designations are used. Regionally significant streets must be classified for consistency with the 2000 RTP classifications for freight. While Portland uses different names for street classifications than those in the RTP, they are generally equivalent as shown on the matrix in this plan.

Policy 6.9, Freight Classification Descriptions, describes the freight districts, the four types of truck streets, and rail and freight facilities.

- Portland's Freight Districts include virtually all marine facilities, rail yards, air cargo facilities, reload facilities, truck terminals, and distribution facilities, as identified on Metro's regional freight system map. All streets within a Freight District, including Local Service Truck Streets, may be used for delivery of goods and access to truck-related industries.

Outside of Freight Districts, truck streets are classified as follows:

- Regional Truck Streets are intended to provide for interstate and interregional truck trips that bypass a district completely or have only one trip end within a Transportation District.

- Major Truck Streets are intended to provide for truck trips with one or both trip ends within a Transportation District, and to distribute traffic from Regional Truck Streets to Minor Truck Streets.

- Minor Truck Streets are intended to serve truck trips with both trip ends within a Transportation district, and to distribute traffic from Major Truck Streets to Local Service Streets to and from shipping and receiving points.

- Local Service Truck Streets are intended to provide for local circulation, access, and service requirements for truck movement.

- Major intermodal freight facilities are classified as either Main Rail Lines or Freight Facilities. Main Rail Lines are those identified as Class I rail lines—for example, the Union Pacific and Burlington Northern/Santa Fe. Freight Facilities are the major shipping and air terminals, and rail facilities that serve the statewide, interstate, and international movement of goods or commodities. These designations are in addition to the Freight District designation, which is where most of these intermodal facilities are located.

Policy 6.29, Freight Intermodal Facilities and Freight Activity Areas, guides the development and maintenance of the freight transportation system to ensure the safe and efficient movement of freight, goods, and commercial vehicles within and through the City. Several objectives address the need for coordination with other agencies, particularly the Port of Portland, in planning and developing road, marine, aviation, and rail facilities.

Policy 6.30, Truck Movement, guides the use of the transportation system by trucks. The policy attempts to balance the needs of trucks to travel to and from intermodal facilities, freight districts and other destinations with the needs of residents for quiet, livable streets. The policy recognizes that delivery and service trucks need to use local residential streets, but that through truck movement should be confined to higher classified streets. Generally, the longer the truck trip, the higher classified the street it travels on should be. Tools to insure that this occurs are street design (narrow residential streets), operation (tight corner radius), permitting (oversize load permits), and signing (truck-restricted streets).

DISTRICT FREIGHT-RELATED OBJECTIVES

District-specific objectives addressing freight and truck issues are included within the Transportation District policies of Goal 6. Selected objectives are listed below; the complete text of the district policies and objectives is contained in Chapter 2. Truck traffic is of

particular interest to North Portland residents, leading to the St. Johns Truck Strategy, which was completed in 2001.

North:

- Improve truck and freight movement in North Portland through changes to the street system, street classifications, and signing to enhance the economic vitality of the area and minimize impacts on residential, commercial, and recreational areas. (Policy 6.34, Objective A)

- Support use of the North Marine Drive/Lombard (north of downtown St. Johns)/North Columbia Boulevard loop as the truck and commuter access to the Rivergate Industrial Area and adjacent industrial uses. (Policy 6.34, Objective B)

- Direct industrial traffic onto North Columbia Boulevard, while allowing limited access from residential neighborhoods and mitigating for unacceptable traffic impacts. (Policy 6.34, Objective C)

Northeast:

- Encourage automobile and truck through-traffic to use major arterials at the edges of the district to reduce peak-period traffic impacts and to preserve neighborhood livability. (Policy 6.35, Objective A)

Far Northeast:

- Enhance the arterial system by improving connections and eliminating bottlenecks, such as rail crossings and viaducts, that contribute to intrusions into residential neighborhoods by commercial, industrial and non-local traffic. (Policy 6.36, Objective A)

Southeast:

- Discourage regional and interdistrict truck traffic from using Local Service Streets in Southeast Portland by establishing convenient truck routing and signing that better serve trucks, while protecting Southeast neighborhoods. (Policy 6.37, Objective G)

Northwest:

- Route non-local and industrial traffic around the edges of the district on Major City Traffic Streets and Regional Trafficways. (Policy 6.39, Objective B)

Goal 11B Public Rights-of-Way

Freight and truck-related policies and objectives under Goal 11B focus on carrying out the 2040 Growth Concept, including providing adequate access to employment and industrial areas. Policy 11.10, Street Design and Right-of-Way Improvements, Objective I states, "Improve streets within Freight Districts and on truck-designated streets to facilitate truck movement." Objective F under Policy 11.13, Performance Measures, includes 'mobility and access' and 'economic development' as topics for which benchmarks should be measured.

Central City Transportation Management Plan
The Central City Transportation Management Plan (CCTMP) recognizes that all of Lower Albina and a large portion of the Central Eastside have important industrial functions. Policy 2.7, Maintain Access to Industrial Activities, supports mobility for commercial vehicles serving industrial activities. Policy 2.8, Industrial Sanctuaries, supports protecting the Central City's industrial sanctuaries from commercial development and its associated parking.

Other Truck and Freight-Related Policies and Objectives
Many of the policies and objectives under Goal 5, Economic Development, address the importance of freight and truck movement in Portland, as identified below.

Policy 5.1, Urban Development and Revitalization, Objective C, states:

> Retain industrial sanctuary zones and maximize use of infrastructure and intermodal transportation linkages with and within these areas."

Policy 5.4, Transportation System, states:

> Promote a multi-modal regional transportation system that encourages economic development.

Objective A of Policy 5.4 states:

> Support regional transportation improvements to facilitate the efficient movement of goods and services in and out of Portland's major industrial and commercial areas. Ensure access to intermodal terminals and related distribution facilities.

Objective B of Policy 5.4 states:

> Support the maintenance and efficient use of the transportation infrastructure for local, national, and international distribution of goods and services.

Policy 5.5, Infrastructure Development, specifically addresses the importance of public infrastructure in fostering economic development in City-designated target areas.

Objective D of Policy 5.5 states:

> Build public and private partnerships to link public infrastructure development to other development plans.

Objective E of Policy 5.5 states:

> Use public investment as a catalyst to foster private development in Council-designated target areas.

Policy 5.10, Columbia South Shore, addresses the needs of one of the most important employment and industrial areas of the city, including maintaining the capacity of the area infrastructure to accommodate future development.

Objective F of Policy 5.10 states:

> Protect the transportation capacity of the area's highways and roads through both review of individual projects and identification and construction of new facilities which increase the system's capacity.

Objective G of Policy 5.10 states:

> Recognize the importance of Portland International Airport and other regional transportation facilities to the South Shore district.

Existing Conditions

Summary of Inventory

The total freight tonnage moved in and around the Portland metropolitan area was more than 165 million tons in 1996. In 1996, the truck share of this cargo was 106 million tons, or 61 percent, of the total tonnage. Trucks carried 68 percent of the value of all freight.

The TSP Inventory (1996) describes air, freight, mainline, and pipeline facilities. (Air, rail, water, and pipeline facilities are addressed in a separate modal plan later in this chapter.) The TSP Inventory describes the 273 freight facilities by category. Marine facilities including port terminals, rail facilities, airports, reload facilities (rail-to-truck and truck-to-truck), truck terminals, distribution facilities, carriers, and freight forwarder and customs brokers. Mainline freight carriers include navigable waterways, railroad main lines, and main roadway routes. Pipeline distribution centers are also identified. The vast majority of these facilities are located in areas zoned as industrial sanctuaries and freight districts.

Recent Freight Studies and Plans

Recently completed studies include (additional details can be found in Chapter 12, Area Studies, Volume II of the TSP):

West Hayden Island Marine Terminal Development
West Hayden Island is separated on the south from Portland by the Oregon Slough. The only automobile access to Hayden Island is via I-5 which connect the eastern end of the island to both Portland and Vancouver via the Interstate Bridge. Rail access is provided by a main line of the Burlington Northern Santa Fe Railroad which runs north/south across the center of the island. Through earlier studies, it was determined that a need for future marine industrial use would exist and West Hayden Island was the only major land parcel available to meet this need.

In order to transition the West Hayden Island area to marine terminal facilities and an intermodal rail yard in accordance with the West Hayden Island Development Plan, a transportation analysis was completed in 1999. The purpose of the analysis was to identify

specific traffic impacts associated with development of the bulk terminal and the container terminal/intermodal rail yard. The analysis showed that the addition of bulk terminal traffic would have no adverse traffic impacts. The addition of a container terminal(s) and intermodal rail facilities would result in adverse impacts to traffic operation on Hayden Island and at the intersection of I-5 with Marine Drive. A bridge linking West Hayden island to Marine drive is proposed in conjunction with development of the marine terminal facilities and the intermodal rail yard. Development of West Hayden Island is not occurring immediately because of cost and other issues.

Columbia Corridor Transportation Study

The Columbia Corridor reaches from the Rivergate Industrial District on the west to Troutdale on the east. The purpose of the study was to look at ways to reduce or remove the impacts of truck traffic on NE Marine Drive and on NE 33rd Drive. The 1999 study adopted by City Council resolution recommends accommodating future traffic by directing more traffic to existing underutilized facilities before constructing increased traffic capacity. Improvements fall into four categories: expanded transit service, safety and traffic management projects, connectivity improvements, and system improvements. (Additional details of the study and its recommendations are in Chapter 12 of Volume II of the TSP.

St. Johns Truck Strategy

The St. Johns Truck Strategy was in response to citizen requests during the 1992 update of the Transportation Element regarding the impacts of truck traffic on residential and commercial streets in the North Portland area. The intent of the study was to identify ways to reduce or remove truck traffic on these streets while providing for truck movement across the peninsula from Columbia Boulevard, I-5, and the industrial areas in North Portland to the St. Johns Bridge. The recommendations from the St. Johns Truck Strategy include:

- Designating a truck route between Columbia Boulevard and the St. Johns Bridge
- Limiting truck weights for local deliveries
- Follow-up studies to evaluate implemented projects and to study hazardous materials movement
- Education and enforcement of existing regulations and a truck signing program
- Projects including traffic calming, redesign/rebuild of certain intersections and street segments

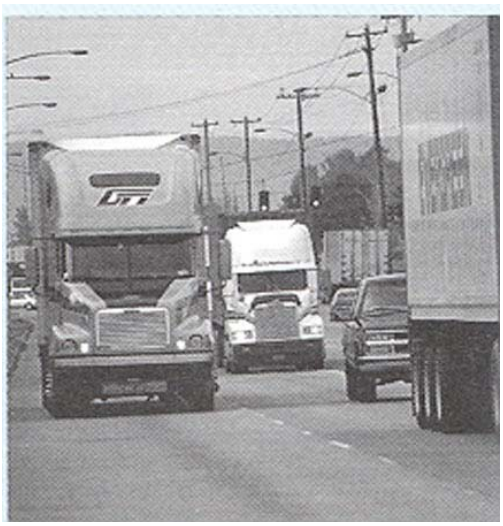
Additional detail on the St. Johns Truck Strategy can be found in Chapter 12, Area Studies, of Volume II of the TSP and in the St. Johns Truck Strategy report and recommendation dated May 2001.

Currently underway is:

I-5 Transportation and Trade Partnership

The states of Washington and Oregon initiated the I-5 Transportation and Trade Partnership in response to recommendations of a 1999 bi-state leadership committee considering the effects of congestion on the highway and rail systems. It recommended that that the region develop a strategic plan for the I-5 corridor to address the transportation mobility needs in the corridor between I-205 in Vancouver and I-84 in Portland. The outcome will be list of recommendations and implementation measures, including future exploration of innovative

Existing Deficiencies



Recent studies of the truck freight distribution system have identified a number of deficiencies within the system. The majority of those deficiencies take the form of congestion or street/intersection design, leading to delays and/or trucks seeking alternate routes that may not be part of the designated truck routing system. A lack of appropriate truck route signing also contributes to unnecessary truck freight movement in residential and commercial areas.

The important geographic elements that make Portland one of the largest and most important distribution centers on the West Coast will continue to direct the City's business interests in the foreseeable future. Truck freight volume tends to grow at a faster rate than the region's population. The growth assumptions used by the Metro and Port of Portland's commodity flow model include a 4.2 percent annual growth in truck trips. The same source shows a doubling of freight volume by the year 2030. Barge, ship, and rail tonnage is also expected to grow.

If there is no significant change in how the region provides for truck freight, these assumptions foretell a future of inconsistent and inefficient truck trips and delayed cargo or supplies.

Regional Freight System Performance

The RTP states that of the total goods moving into, out of, and within the region, 62 percent complete all or part of the trip by truck. By 2020, the increase in truck trips will result in an average 30 percent increase in truck travel times. Regional truck delay hours are expected to increase by more than nine times over 1994 levels by 2020 if no new transportation projects are constructed.

Identified deficiencies in the system include street and intersection designs, including railroad crossings, turn movements, signalization, and freeway interchanges. The greatest negative impact on truck freight movement is congestion, which causes delays and difficulty in maintaining specific schedules. Congestion and delay shave encouraged peak truck freight movement to occur prior to the PM peak period, to avoid the heaviest traffic. For example, peak direction travel in the I-5 corridor consumes between about 80 and 100 percent of the corridor's capacity. Within the two-hour periods, travel demands approach or surpass the corridor's capacity, resulting in congestion and slow travel speeds. During the midday, when the highest volume of trucks use the freeway (e.g., 11 percent of the traffic across the I-5 bridge consists of heavy trucks), from 30 to 80 percent of the corridor's capacity is used.

Many of the regional corridors that carry truck freight are expected to experience continued congestion over the next 20 years. These corridors include I-5 North, I-205, and I-84. Future studies will address the major identified corridors where adequate improvements have not

been included in the RTP. The RTP and Chapter 4, Refinement Plans and Studies, of the TSP provide additional information about the issues and study objectives for these corridors.

Issues from District Needs Assessment
In fall 1998, PDOT held TSP workshops in each of the Transportation Districts to gather information about transportation issues and community needs. The resulting District Needs Assessments reinforce and expand upon the deficiencies and concerns identified in studies and the TSP Inventory. Residents' most common concern was the inappropriate use of neighborhood streets by trucks. Other concerns about trucks included the hours of operation, loading practices, size of trucks, and noise.

Two of the top seven values identified in the workshops relate to trucks and freight: providing for the movements of goods, and supporting economic development and access to jobs. In addition, managing congestion was a key value mentioned at all district workshops.

Implementation Measures

Existing Regulations

Hazardous Substances
Title 33, Planning and Zoning, regulates the use, storage, and routing of hazardous substances.

In the Portland Planning and Zoning Code, Chapters 33.140, Employment and Industrial Zones, and 33.840, Hazardous Substances Review, regulate the use, storage, and routing of hazardous substances. Paragraph 33.840.030, Evaluation Factors, requires applicants for Hazardous Substances Review to relate the location of their site "to City-designated routes for the transport of hazardous substances." At this time, the City does not have designated hazardous substances routes. Chapter 33.840 requires applicants for Hazardous Substances Review to relate the location of their site to "City-designated routes for the transport of hazardous substances."

Truck Loading
Truck loading facilities are required on private property for any building with 20,000 square feet or more of floor area. Buildings with more than 50,000 square feet of floor area require two loading spaces. Loading spaces must be set back from the street or other property lines and provided with landscaping.

Projects

The following TSP projects provide examples of projects that address freight movement needs (not listed in order of importance or funding priority):

- Grand/Martin Luther King Jr Viaduct Reconstruction (Project No. 20036)
- Southern Triangle Circulation Improvements (Project No. 20050)
- Going/Greeley Climbing Lane and Interchange Improvements (Project No. 30016)

- North I-5 Widening (Project No. 30022)
- 11th/13th Roadway Connector (Project No. 40001)
- 47th/Cornfoot Intersection Improvements (Project No. 40009)
- 105th/Clark/Holman Street Improvements (Project No. 50017)
- South Portland Improvements (Project No. 90060)

Potential Strategies

Region 2040

The relationships, conflicts, and mitigation of truck deliveries and loading practices with the form and function of designated urban centers, including the Central City, regional centers, town centers, main streets and station communities is an on-going need. Freight needs should be considered as a part of area plans and strategies developed to address these needs and potential conflicts. Strategies to consider include:

- Timed truck deliveries (off-peak hours, specified hours)
- Loading regulations and/or loading facility requirements (placement, hours of operation, screening)
- Truck regulation enforcement

Specific truck freight needs should be addressed in the City's industrial districts such as, Johnson Creek, Banfield, Brooklyn, Central Eastside, Guild's Lake, Lower Albina, and Swan Island. Strategies to consider include:

Hazardous Substances

Several possible responses to moving hazardous substances could be explored.

- All or some existing truck routes could be designated as hazardous substance routes.
- Hazardous substance shipments could be directed to emergency service routes. However, some emergency service routes coincide with the state's identification of areas where hazardous substance movement is prohibited (I-26 tunnel, Balboa Street crossing of railroad tracks). (Emergency Response Classification Study, PDOT & Bureau of Fire, Rescue & Emergency Services, 1998)

The following considerations apply in designating hazardous substances routes:

- Routes with storm drainage or runoff directly to rivers, streams, or other bodies of water used for human consumption should be avoided.
- No specific identifiable situations that could increase the likelihood of spills should be included, such as dangerous intersections, steep grades, and inadequate street improvements.

- No situations that could unduly exacerbate the effects of a hazardous material spill should be included, such as proximity to schools, residential areas, community water supplies, or sensitive environmental areas.

Information and Education
Truck movements can be improved through informational and educational efforts. Strategies include:

- Provide clarity of truck routes through signing, including hazardous substances routes.
- Provide information about Portland's truck routes and facilities to truck freight businesses and/or companies with their own truck fleets.
- The provision of information to business transportation managers, dispatchers, truck drivers, and others responsible for truck routing.

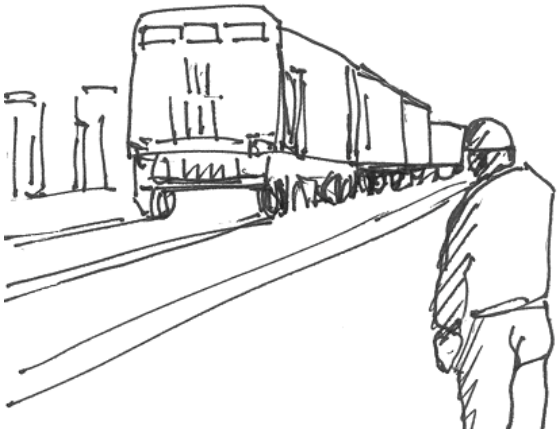
Conclusion

As the RTP states, the significant growth in freight movement that is projected by the 2040 Commodity Flow Analysis indicates that there is a need for an adequate supply of land for intermodal facilities and the need to maintain and enhance the freight transportation system. The TSP addresses the freight movement needs inside Portland through recommended projects and future studies.

AIR, RAIL, WATER, AND PIPELINE MODAL PLAN

Introduction

Air, rail, water, and pipeline (ARWP) facilities provide alternative modes to motor vehicles for delivering and distributing necessary goods and services. They help reduce road congestion and associated vehicle-produced air and water pollution. In some cases, they serve where typical ground vehicles would be impractical, such as for conveying power, data, bulk goods, large quantities of smaller goods, or rapid national or global distribution.



The authority to regulate ships, trains, and planes and their movements lies mostly with the federal government. The Oregon Public Utility Commission also has regulations affecting trains, such as railroad crossings. The City of Portland's authority is largely limited to regulation of support facilities (land uses), such as train stations, airports, and docking facilities.

The Port of Portland's Portland International Airport and Columbia and Willamette River terminals serve airborne and shipborne traffic, providing connections to other modes of travel. The federal government regulates air space, river and coastal waters, and the routes used by these modes.

AMTRAK, an agency of the federal government, provides rail passenger service. The Burlington Northern/Santa Fe Railroad and Union Pacific Railroad provide freight movement. Railroads and railroad rights-of-way are privately owned.

The public pipeline infrastructure includes water distribution, sewage, and stormwater collection. Investor-owned utilities include natural gas and petroleum pipelines, as well as electronic trunk lines for television, telephone and data transmission wire, and fiber optic cables. Pipeline distribution occurs largely within easements, both within and outside of street rights-of-way.

Requirements

The state Transportation Planning Rule (TPR) requirements include Oregon Revised Statute (ORS 660-12-020), Elements of Transportation System Plans, and ORS 660-12-030, (1) (c), Determination of Transportation Needs. These sections require local jurisdictions to prepare modal plans, including "air/mainlines and pipelines," and to consider the "movement of goods and services to support industrial and commercial development."

In addition to the common elements that must be included in each of the modal plans (as described on page 5-2), the TPR contains the following elements specific to the air, rail, water, and pipeline modes:

- Location of public use airports.
- Location of mainline and branchline railroads and railroad facilities.
- Location of port facilities.
- Location of major regional pipelines and terminals.
- For airports, the planning area includes the areas within airport imaginary surfaces (flight envelopes).

The TSP inventory (supporting document) identifies the location of these facilities. Major port and rail facilities are shown on the maps for each of the City's seven Transportation Districts, located under policies 6.34 through 6.40 in Chapter 2 and on the CCTMP district map for freight.

Approach to Mode

Consistent with the themes for the TSP, Portland's approach to the provision of air, rail, water and pipeline services is:

- Management of public resources and infrastructure to further the planning objectives for the development and maintenance of the air, rail, water and pipeline facilities identified in the Portland Comprehensive Plan, the Portland Regional Framework Plan, and the Regional Transportation Plan.
- Recognize the contributions that air, rail, water and pipeline facilities make to the economic well being of the City.
- Administration and management of the street rights-of-way, as necessary for the distribution of goods and services provided by mainlines and pipelines.
- Provision of safe and efficient access to regional air, water and rail facilities.

The objectives of the Air, Rail, Water and Pipeline Modal Plan are to:

1. Support the economic health of Portland and the region through planning and development of marine, aviation, and rail facilities with the Port of Portland and other affected agencies, groups, and individuals.
2. Support rail as a primary mode for freight movement.
3. Provide support for area and regional planning for major regional pipelines and terminals.
4. Maintain the viability and efficiency of Union Station as the multimodal transportation hub for downtown Portland, Portland International Airport as the air passenger hub facility for the region, and other passenger transfer facilities in existing and emerging regional centers.

5. Support expansion of and improvements to the Northwest Corridor passenger rail service between Eugene, Portland, Seattle, and Vancouver, B. C., including high speed rail service.

Policy Framework

City of Portland Comprehensive Plan

The City of Portland's Comprehensive Plan addresses a broad range of goals and policies for the City. Specific goals and policies relating to ARWP facilities are contained in:

- Goal 5 Economic Development
- Goal 6 Transportation
- Goal 11 A Public Facilities
- Goal 11 C Sanitary and Stormwater Facilities
- Goal 11 E Water Service

These policies emphasize the public or private provision of infrastructure (sanitary and stormwater sewers and water supply), Portland International Airport and Union Station as multimodal passenger centers, freight-related intermodal facilities (marine and aviation), and the quality and maintenance of distribution facilities.

Transportation Element

Goal 6 and Goal 11B along with the CCTMP make up the Transportation Element of the Comprehensive Plan.

Goal 6 Transportation
Policies and objectives within Goal 6 that relate to ARWP facilities are primarily under Policy 6.9, Freight Classification Descriptions, and Policy 6.29, Freight Intermodal Facilities and Freight Activity Areas.

Policy 6.4, Classification Descriptions, describes how the classification descriptions and designations are used. Policy 6.9, Freight Classification Descriptions, describes the freight districts where most ARWP facilities are located and rail and freight facilities.

- Portland's freight districts include virtually all marine facilities, rail yards, air cargo facilities, reload facilities, truck terminals, and distribution facilities, as identified on the RTP's freight system map. All streets within a Freight District, including Local Service Truck Streets, may be used for delivery and movement of goods and access to truck-related industries.

- Main Rail Lines are those that are identified as Class I rail lines, for example, Union Pacific and Burlington Northern/Santa Fe.

- Freight Facilities include major shipping and air terminals and rail facilities that serve the statewide, interstate, and international movement of goods and commodities.

Policy 6.29, Freight Intermodal Facilities and Freight Activity Areas, guides the development and maintenance of the freight transportation system to ensure the safe and efficient movement of freight, goods, and commercial vehicles within and through the City. The objectives address the need for coordination with other agencies, particularly the Port of Portland, in planning and developing road, marine, aviation, and rail facilities. Since Portland does not have a lead role in developing ARWP facilities, coordination and inter-jurisdictional planning is its main involvement.

District freight-related objectives relate primarily to truck freight movement and are detailed in the Freight Modal Plan in this chapter.

Goal 11B Public Rights-of-Way

Freight-related policies and objectives under Goal 11B focus on carrying out the 2040 Growth Concept, including providing adequate access to employment and industrial areas. Objective F under Policy 11.13, Performance Measures, includes "mobility and access" and "economic development" as topics for which benchmarks should be developed to evaluate the TSP.

Central City Transportation Management Plan

The Central City Transportation Management Plan (CCTMP) recognizes that all of Lower Albina and a large portion of the Central Eastside have important industrial functions. Policy 2.8, Industrial Sanctuaries, supports protecting the Central City's industrial sanctuaries from commercial development.

Other ARWP-Related Policies and Objectives

Outside of Goals 6 and llB, several policies and objectives address AWRP facilities, as identified below.

GOAL 5 ECONOMIC DEVELOPMENT

Policy 5.4, Transportation System, Objectives A and B, support "transportation improvements that facilitate the efficient movement of goods and serves" and the "maintenance and efficient use of the transportation infrastructure for local, national, and international distributions of goods and services."

Policy 5.10, Columbia South Shore, Objective G, recognizes "the importance of Portland International Airport" to the South Shore district.

GOAL 11 PUBLIC FACILITIES

Goal 11A contains sub-goals and policies that address the City's infrastructure. Policy 11.1, Service Responsibility, and Policy 11.6, Public Facilities System Plan, require the City to provide facilities and services at appropriate levels for all land use types and to develop a public facilities plan that addresses the needs of the City for the following 20 years.

Goal 11 C, Sanitary and Stormwater FacilitiesPolicies require the development and maintenance of a sanitary and storm sewer system that will "meet the needs of the public and comply with federal, state and local clean water requirements."

Goal 11 E, Water ServicePolicies require the City to "insure that reliable and adequate water supply and delivery systems are available to provide sufficient quantities of high quality water to meet the existing and future needs of the community." In particular, Policy 11.32

requires that storage and distribution facilities are maintained in order to protect water quality, insure a reliable supply, assure adequate flow for all user needs, and minimize water loss.

Existing Conditions

Portland lies approximately 100 river miles from the Pacific Ocean and serves as the collection and distribution point for goods and produce as much as 360 miles upriver. The Port of Portland owns and operates four shipping terminals (Terminals 2, 4, 5, and 6) and one passenger ship boarding facility at Swan Island. Cascade General leases the Swan Island shipyard (dry dock/ship repair) from the Port. The Port is also planning to develop and is initiating the acquisition of approximately 500 acres on West Hayden Island for marine facilities, largely to accommodate growth in container and bulk shipping and car delivery and distribution. While this project is temporarily on hold, it is stilled slated for development in the future.

Several privately owned general-purpose docks and bulk facilities (grain/mineral) provide additional shipping opportunities.

Portland International Airport, the region's major airport, lies within Portland's city limits, adjacent to the Columbia River. It is located close to the region's largest industrial area, Columbia South Shore. The Portland International Center/ Cascade Station site supports airport uses. Including all related and proximate facilities, the airport totals approximately 3,200 acres, and the Portland International Center/ Cascade Station site encompasses 458 acres.

Portland International Airport lies within the Columbia South Shore Plan District, West Columbia Industrial District, and Northeast Truck District. Portland International Center is a separate plan district, and is also within the West Columbia Industrial District and the Northeast Truck District.

Plan districts *address concerns unique to an area when other zoning mechanisms cannot achieve the desired results. Each plan district has its own nontransferable set of regulations (Title 33 Planning and Zoning Code, Chapter 33.500, Plan Districts in General).*

Portland International Airport is allowed and regulated through a 10-year conditional use master plan, which addresses all aspects of the airport's growth and operation. The City is in the process of updating and approving the master plan. The nearly 500-acre Portland International Center/ Cascade Station site east of the airport will include office, retail-commercial, lodging, entertainment, warehousing, and manufacturing uses in support of the airport, as well as airport-related parking (employee and rental cars). This recently approved site was previously regulated as a planned unit development, a form of conditional use, but is now regulated as a Plan District. The movement of truck freight, and all other street traffic, to and from the airport is regulated by a transportation agreement between the Port of Portland and the City of Portland for certain street improvements, and by regulations included within the Portland International Center/Cascade Station Plan District.

The Port of Portland's air facilities serve growing passenger and freight movement. A total of 2.5 million air passengers in 1970 grew to 13.0 million in 1998. Air freight movement, including mail, was less than 100,000 tons in 1970, and grew to over 320,000 tons in 1998. (Port of Portland, Portland International Master Plan Summary Report, September 2000)

The airport and its related facilities also provide for general aviation and helicopters. In addition, several other public and private helicopter facilities/landing pads are located at area hospitals and downtown structures, Tom McCall Waterfront Park, and the Rose Garden.

The Union Station rail and bus multimodal facility predates the conditional use process. The Trailways bus depot was sited and operates in accordance with a conditional use review, as does an approved ship passenger boarding facility at Swan Island.

The Trailways bus depot and Union Station train passenger facilities are located within the Central Business District. Other rail facilities, such as the Albina and Brooklyn rail yards (northeast and southeast Portland, respectively), provide for the distribution of freight by rail.

Portland International Airport has a significant freight component, while the Union Station rail depot and Trailways bus depot do not.

Rail terminals (rail yards) for freight have undergone significant change in recent years. A reliance on large, all-encompassing rail yards has given way to smaller switching yards, unit trains, and other technologies. Of five railroads serving this area in 1980, only Burlington Northern/Santa Fe and Union Pacific are left, and only two rail yards of significant size remain in Portland: Brooklyn and Lower Albina. Both of these larger rail yards, and a number of smaller switching yards, were established prior to the City's current conditional use review requirements. Freight moved by rail totaled 10.3 million tons in 1996. (Metro, Commodity Flow Analysis for the Portland Metropolitan Area, 1999) Union Station provides the only passenger station for rail travel within the metropolitan area.

Private river tours often depart from and return to downtown Portland at either Tom McCall Waterfront Park or the Riverplace marina, both within the Central Business District.

Recent Studies and Plans

Columbia River Channel Deepening

The Columbia River navigation channel is 114 miles long, 40 feet in depth, and 600 feet wide. It is a very important pasaage to reach port facilities in Oregon and Washington. The transpacific container fleet is getting larger; 75 percent is constrained by the current channel. Over 50 percent of the grain vessels are also constrained. The Bi-State Committee on the Columbia River Channel are recommending deepening the channel from 40 to 43 feet to accommodate present and future fleet requirements while meeting environmental requirements and building public consensus for the project. An analysis has found that approximately one-half of the channel would require deepening, but there are environmental issues including sediment quality, compliance with the Endangered Species Act (ESA), dredge disposal, and ecosystem restoration. In January 2002, the U.S. Army Corps of Engineers completed a Biological Assessment for the Columbia River channel deepening project. In May, National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) released 'no jeopardy' opinions. The U.S. Army Corps of Engineers will issue a draft supplemental EIS for public comment in July, with the final document to be released in Fall 2002.

If the project goes forward, it is expected to cost $183.6 million with Oregon's share approximately $10 million.

West Hayden Island Marine Terminal Development

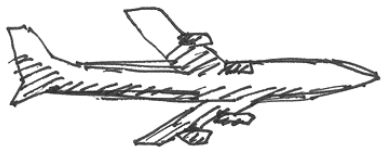
West Hayden Island is separated on the south from Portland by the Oregon Slough. The only automobile access to Hayden Island is via I-5 which connect the eastern end of the island to both Portland and Vancouver via the Interstate Bridge. Rail access is provided by a main line of the Burlington Northern Santa Fe Railroad which runs north/south across the center of the island. Through earlier studies, it was determined that a need for future marine industrial use would exist and West Hayden Island was the only major land parcel available to meet this need.

In order to transition the West Hayden Island area to marine terminal facilities and an intermodal rail yard in accordance with the West Hayden Island Development Plan, a transportation analysis was completed in 1999. The purpose of the analysis was to identify specific traffic impacts associated with development of the bulk terminal and the container terminal/intermodal rail yard. The analysis showed that the addition of bulk terminal traffic would have no adverse traffic impacts. The addition of a container terminal(s) and intermodal rail facilities would result in adverse impacts to traffic operation on Hayden Island and at the intersection of I-5 with Marine Drive. A bridge linking West Hayden island to Marine drive is proposed in conjunction with development of the marine terminal facilities and the intermodal rail yard. Development of West Hayden Island is not occurring immediately because of cost and other issues.

Future Conditions

Growth in air, rail, and waterborne freight and passengers will put significant burdens on existing facilities and services, or even on proposed new facilities and services. Additional or expanded facilities are typically subject to City land use review, which is intended to eliminate unnecessary impacts on surrounding land uses or to require mitigation of those impacts that cannot be eliminated.

Traditional public utilities, such as sewer and stormwater, are undergoing significant changes in the City. Sewage and stormwater are being converted to separate systems to improve water quality of the Willamette River and Columbia Slough. Pipeline facilities are rapidly diversifying; basic infrastructure needs now include investor-owned electronic services such as fiber optic or cable access trunk lines for data and remote systems control.

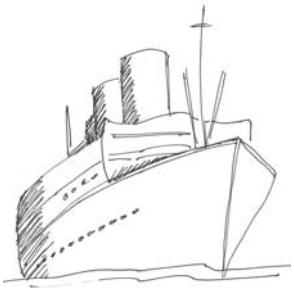


Continued significant growth is expected for both air passengers and air freight. Although air freight represents only about one tenth of one percent of all freight tonnage in the region, it moves some of highest-valued products, largely from high-technology sources. Air freight tonnage is expected to increase more than three-fold from 1998 tonnage to 958,000 tons in 2020. (Port of Portland, Port Transportation Improvement Plan, 1997) The number of air passengers is expected to more than double from 1998 (13.0 million) to 2020 (27.0 million). (Port of Portland, Portland International Master Plan Summary Report, September 2000)

The growth in air freight and passenger service will require increased air service facilities. It has not yet been resolved whether airport facilities should be expanded at Portland International Airport or a satellite location, or if a new regional airport should be built. The Regional Air Transportation Demand Task Force (of Portland State University's Institute of Portland Metropolitan Studies) has reviewed these issues and recommends not creating any major new facilities at this time.

Bulk goods (grains and minerals) moved through Portland constitute more than half of the region's annual export tonnage. Most of the bulk goods to be exported arrive by unit trains. However, about 40 percent of grain exports arrive in Portland by barge. The future promises even more bulk goods via both unit trains and barges, through both the Port of Portland and private facilities. (Metro, Commodity Flow Analysis for the Portland Metropolitan Area, 1999)

Rail freight movement in the area is not expected to grow as fast as other segments of the economy. The volume of domestic rail freight is expected to increase by less than 2 percent in the medium term and less than 1.5 percent in the long term. International rail freight is expected to grow about twice as fast as domestic: 4.4 percent in the short term and 3.9 percent in the long term. (Metro, Commodity Flow Analysis for the Portland Metropolitan Area, 1999)



High expectations are held for marine freight, where tonnage is expected to increase more than three-fold by 2030. (Scott Drumm, Port of Portland, commodity flow presentation to St. Johns Truck Strategy Advisory Committee, 2001) More barges, bulk shipping, and car unloading are expected to occur at Port of Portland and private terminals. These expectations lead to concerns about sufficient land for marine facilities in future years.

In a more speculative vein, it is expected that water taxis and commuter boats will add to the transportation options in Portland and the region. River tour activities are also expected to increase. Portland has existing facilities to accommodate significant waterborne commuter or commercial recreational traffic, such as the Tom McCall Waterfront Park seawall, Eastside Esplanade docking facilities, South Waterfront marina and docking facilities, and Swan Island passenger terminal. Growth in these activities will likely result in additional development requests for small- to medium-sized docking and passenger boarding facilities.

Implementation Measures

Title 33

Portland City Code, Title 33, Planning and Zoning, regulates pipelines, other trunklines (such as fiber optic cables), and rail lines, under the category of Rail Lines and Utility Corridors. This land use category is allowed by right in employment and industrial zones, and is a conditional use in all residential and commercial zones.

Title 33 also regulates rail, bus, and air passenger terminals, under the category of Aviation and Surface Passenger Terminals. This land use category is not allowed in residential or most commercial zones. Where it is not an allowed use, it is regulated as a conditional use.

*The **conditional use** review provides an opportunity to allow a use when there are minimal impacts or to mitigate for impacts to address identified concerns, or to deny the use if the concerns cannot be resolved. (Title 33: Planning and Zoning Code, Chapter 33.815, Conditional Uses)*

The Aircraft Landing overlay zone in Title 33 is intended to provide safer operating conditions for aircraft in the vicinity of the Portland Airport by limiting the height of structures and vegetation. All structures and vegetation within the Aircraft Landing zone are subject to height limits to protect aircraft during take-offs and landings.

The Portland International Airport Noise Impact overlay zone in Title 33 is intended to reduce the impact of aircraft noise on development within the noise impact area surrounding the airport. The zone achieves this by limiting residential densities and by requiring noise insulation, noise disclosure statements, and noise easements.

Title 33 regulates truck, marine and rail freight terminals, and grain terminals, under the category of Warehouse and Freight Movement. This land use category is an allowed use only within employment and industrial zones, it is prohibited in other zones. The Port of Portland and a few private companies control shipborne freight movement within the City of Portland, through various docks, grain and shipping terminals.

Significant portions of the Willamette and Columbia River frontages have been zoned for employment or industrial uses. This includes the Port of Portland's Terminals 2, 4, 5, and 6 and Swan Island. A number of private docks and bulk goods (grain, mineral) terminals are interspersed with the Port's facilities.

Title 17

Title 17, Public Improvements, provides for installation of utilities within the right-of-way. Investor-owned utilities are required to enter into a franchise agreement before use of the right-of-way is allowed.

Projects

The identification of improvements or actions necessary to meet state and regional goals and requirements is integral to the TSP. Improvements included in the TSP projects list (Chapter 3) for the upkeep of ARWP facilities include:

- Several projects to provide access to businesses currently impacted by railroad crossing difficulties (Lombard, Division Street, and Marine Drive rail crossings) (Project Nos. 30048, 20023, 30039)

- Boat docks accessible to water taxis, at Oaks Park and the Steel Bridge (Project No. 70048)

- Railroad improvements, including expanding rail capacity in and to Rivergate, and rail access from Rivergate to Hayden Island (Project Nos. 30019, 30054, 30055)

Programs and Strategies

In addition to projects identified by the TSP process, recent or near-future actions to maintain competitive ARWP facilities in the City and region include:

- Renewal and amendment of the existing Portland International Airport 10-year master plan (Port draft complete; needs City approval)

- Regional discussions about the growth and expansion of Portland International Airport (through the Regional Air Transportation Demand Task Force, of Portland State University's Institute of Portland Metropolitan Studies)

- Deepening of the Columbia River to accommodate larger, more efficient ships

- Combined Sewer Overflow Program to improve the quality of the Willamette River for wildlife and recreation

- Annexation of West Hayden Island, expected to provide more than 500 additional acres for marine-related development for multimodal freight facilities (ship/train/truck)

Conclusion

The efficiency of Portland's economic engine relies to a significant degree on a complete and modern infrastructure, providing for the latest technologies as well as standard services. The ability of local businesses to compete globally depends on access to all levels of technology. Existing goals, policies, and code recognize the need to provide for traditional facilities and services, but do not necessarily accommodate new services.

TRANSPORTATION DEMAND MANAGEMENT and PARKING PLAN

Introduction

Portland has long believed it is not possible to eliminate congestion by building more roads because of the costs involved, effects on air quality, and unacceptable impacts on neighborhoods. Transportation demand management (TDM) holds the most promise for reducing congestion and creating communities that are not dominated by the automobile. TDM includes a variety of strategies to encourage more efficient use of the existing transportation system and reduce reliance on the personal automobile. These strategies include:

- Increasing the number of travel choices, such as transit, ridesharing, walking, bicycling, telecommuting and delivery services.
- Reducing the need for travel by creating more efficient land use.
- Rewarding consumers for using the travel option that fits the trip, using each mode for what it does best.

TDM measures reduce congestion and the need for costly road expansion.

The primary benefit of managing travel demand is to minimize the need to expand the capacity of the region's transportation system (e.g., building new highways or adding lanes to existing highways). Managing travel demand will also help the region reduce overall per capita vehicle travel, reduce air pollution, and maximize energy conservation in a relatively low-cost manner. Other benefits include road and parking facility cost savings, user financial savings, increased road safety, increased travel choice, and increased equity.

Transportation demand management and parking management strategies have historically been focused on the downtown area and the Lloyd District. The primary strategies were designed to reduce automobile trips, encourage transit use, and discourage commuter parking through a variety of parking pricing strategies, regulations, and employer incentive programs.

More recently, demand management activities have spread throughout the City and region. While transit is the main focus in diverting trips from single-occupant vehicles, over three dozen common TDM strategies are available. The City, Tri-Met, Metro, DEQ, and transportation management associations (TMAs) are pursuing a number of these approaches.

Requirements

Transportation Planning Rule

The state Transportation Planning Rule (TPR) defines transportation demand management as "actions which are designed to change travel behavior in order to improve performance of transportation facilities and to reduce need for additional road capacity. Methods may include but are not limited to the use of alternative modes, ride-sharing and vanpool programs, and trip-reduction ordinances."

The TPR contains requirements specific to transportation demand management and parking management. The basic requirement is to have a demand management plan and a parking plan. The two plans should do the following:

- Show achievement of a 10 percent reduction in the number of parking spaces per capita over a 20-year period.
- Show achievement of a 10 percent reduction in vehicle miles traveled (VMT) per capita over a 20-year period.
- Show achievement of an additional five percent reduction in VMT within 30 years of adoption of the Transportation System Plan (TSP).
- Establish minimum and maximum parking regulations.
- Be consistent with demand management programs, transit-oriented developments, and planned transit service.

If jurisdictions choose alternative standards instead of the VMT reduction standard, the Land Conservation and Development Commission (LCDC) can authorize alternative standards to demonstrate progress towards achieving reduced reliance on the automobile. Metro is choosing to use an alternative method that relies on non-SOV (single-occupant vehicle) split targets rather than VMT reduction.

In lieu of meeting the 10 percent reduction in parking spaces per capita, jurisdictions may use ordinances to reduce parking, as follows:

- Reduce minimum off-street parking requirements for all non-residential uses from 1990 levels.
- Allow provision of on-street parking, long-term lease parking, and shared parking to meet minimum off-street parking requirements.

- Establish off-street parking maximums in appropriate locations, such as downtowns, designated regional or community centers, and transit-oriented developments.
- Exempt structured parking and on-street parking from parking maximums.
- Require that parking lots over three acres in size provide street-like features along major driveways (including curbs, sidewalks, and street trees or planting strips).
- Provide for designation of residential parking districts.

Employee Commute Option Rule

The Oregon Environmental Quality Commission adopted the Employee Commute Option (ECO) Rule in July 1996 in response to the Federal Clean Air Act. The rule requires employers with 50 or more employees at a single site to reduce vehicle commute trips to their site by 10 percent over three years. The ECO Rule is part of the region's Ozone Maintenance Plan (OMP). Although due to expire in 2006, its requirements will likely be part of a new OMP after that date.

Urban Growth Management Functional Plan

Title 2, Regional Parking Policy, of the Urban Growth Management Functional Plan (UGMFP) is intended to make more efficient use of land and encourage the use of non-SOV modes by restricting the construction of new parking spaces. It requires local jurisdictions to:

- Place an upper limit on the amount of parking that local governments can require for specified land uses.
- Adopt parking maximums no greater than those established by the regional parking ratios for specified land uses.
- Develop large parking lots (over three acres) with 'street-like features' such as curbs, sidewalks, and trees in planting strips

The intent is to link parking minimums and maximums to the availability of transit and the pedestrian environment. Title 2 establishes two zones for the region: one where 20-minute peak hour bus service or light rail is easily accessible and one where this service is not available.

Jurisdictions can determine parking standards that make sense for their communities, but they must substantially comply with the regional adopted limits specified in Title 2. If a jurisdiction chooses to vary from the Title 2 requirements, it must show that its parking regulations, as a package, substantially meet the intent of Title 2. The implementation

section of this modal plan (page 5-148) details the regulations the City of Portland adopted in October 2000 to meet these requirements.

2000 Regional Transportation Plan

The 2000 Regional Transportation Plan (RTP) establishes 2040 regional non-SOV modal targets, as shown in Table 5.11.

Table 5.11
2040 Regional Non-SOV Modal Targets

2040 Design Type	Non-SOV Modal Target
Central City	60 – 70 percent
Regional Centers Town Centers Main Streets Station Communities Corridors	45 – 55 percent
Industrial Areas Intermodal Facilities Employment Areas Inner Neighborhoods Outer Neighborhoods	40 – 45 percent

Note: The targets apply to trips to and within each 2040 design type. The targets reflect conditions appropriate for the year 2040 and are needed to comply with TPR objectives to reduce reliance on single-occupant vehicles.

The alternative mode share targets are intended to be goals for cities and counties to work toward as they implement the 2040 Growth Concept at the local level. They may also serve as performance measures in "areas of special concern" (see the Motor Vehicle Modal Plan in this chapter). Improvement in non-SOV mode share will be used as the *key regional measure* of assessing transportation system improvements in the Central City, regional centers, town centers, and station communities. In other 2040 design types, non-SOV mode share will be used as an *important factor* in assessing transportation system improvements. Local mode share targets can be no less than the modal targets shown in Table 5.10.
In addition, local jurisdictions must identify actions in local TSPs that will result in progress toward achieving the non-SOV modal targets. The actions should include consideration of maximum parking ratios, regional street designs, transportation demand management strategies, and transit's role. Benchmarks to evaluate progress toward achieving modal targets may be based on future RTP updates and analysis if local jurisdictions cannot generate benchmarks as part of their TSPs.

Three regionally adopted RTP policies are relevant to the TDM/parking modal plan:

- Policy 19, Regional Transportation Demand Management, and its objectives are aimed at the regional role in improving access to alternatives to SOV driving, including promoting transit-supportive design and TMAs, establishing mode split targets, and investigating the use of market-based strategies to encourage more efficient use of resources.

- Policy 19.1, Regional Parking Management, supports efficiently managing the use of public and commercial parking through minimum and maximum parking ratios,

adopting parking management plans, and conducting studies of market-based strategies such as parking pricing and employer-based parking cash-outs.

- Policy 19.2, Peak Period Pricing, deals with managing and optimizing the use of highways to reduce congestion, improve mobility, and maintain accessibility. The Metro-led Traffic Relief Options Study, completed in 1999, examined the potential of roadway pricing to meet regional transportation, environmental, and land use goals. The study determined that pricing certain roads would achieve these goals, but did not recommend pricing existing roads at this time. The study did recommend pursuing a pilot project in the near future, particularly where new roadway capacity is being constructed.

Oregon Highway Plan

The 1999 Oregon Transportation Commission requires local TSPs to be consistent with certain policies of the Oregon Highway Plan. The policy applicable to TDM is 4D, Transportation and Demand Management, which states: "It is the policy of the State of Oregon to support the efficient use of the state transportation system through investment in transportation demand management strategies."

Approach to Mode

Successful TDM implementation requires a package of strategies, programs, and measures. As shown in Table 5.12, these include, but are not limited to, enabling programs, alternative mode improvements and encouragement, driving disincentives, parking programs, marginalizing user costs and reducing auto ownership, and linking transportation and land use.

Marginalizing user costs means making the driver pay for more of the costs associated with driving – road damage, congestion, parking facilities, accident damages, and environmental damages.

The City's approach to TDM and parking management has focused on working with employers to create TDM programs for their employees. The City is now expanding its focus to also develop strategies and policies that encourage transportation options such as walking, biking, ridesharing, transit, telecommuting, and smart use of the automobile. In the coming years, the approach will include education, outreach, promotion, removing physical and perceptual barriers, providing incentives to target audiences, and creating and supporting partnerships and initiatives that promote transportation options. This approach is reflected in the following objectives:

- Work with employers to create programs for their employees to reduce SOV trips and increase use of carpooling, transit, and non-motor vehicle modes.

- Continue with the K-5 curriculum, and develop and implement a strong middle school and high school curriculum. Use interactive programs that illustrate the impacts of transportation choices on personal safety, health, and the environment, with a long-term goal to change travel behavior.

- Continue to develop and implement adult education programs such as the Portland State University traffic and transportation class designed for citizen activists to learn about and get involved in Portland transportation issues.

- Continue successful outreach programs to teach residents about safe and convenient places to ride or walk in their neighborhoods.

- Develop new outreach programs and collateral materials to promote and deliver trip reduction strategies.

- Work with employers, primarily through TMAs, to develop strategies and create programs for their employees to reduce SOV work trips.

- Work with businesses and employees in key employment and other regional 2040 centers to develop customized multi-modal transportation programs.

- Continue the use of parking controls.

Table 5.12
Transportation Demand Management (TDM) Measures

Enabling Programs	**Alternative Mode Improvements and Encouragement**	**Driving Disincentives**
• Comprehensive market reforms • Market TDM • Commute trip reduction • Transportation management associations (TMAs) and coordinators • Monitor travel	• Transportation allowances /subsidized transit passes • Park & Ride facilities • HOV facilities and preferential treatment • Transit service improvements • Rideshare programs • Free transit zones/shuttle services • Bicycle improvements • Pedestrian improvements • Bike & transit integration • Teleworking • Alternative work hours • Guaranteed ride home	• Full-cost pricing • Mileage fees • Increased fuel taxes • Road pricing • Vehicle restrictions
Parking Programs	**Recognizing user costs and reducing car ownership**	**Land Use Management**
• Increased and marginalized parking prices • Cash-out free parking • Reduced and flexible parking requirement • Preferential parking for rideshare vehicles	• Prorate insurance, licensing & registration by mileage • Distance-based vehicle purchase taxes • Encourage vehicle rentals and ownership cooperatives	• Higher density/mixed use/growth management • Neotraditional neighborhoods & transit-oriented development • Traffic calming • Transportation-efficient development & location-efficient mortgages

Source: PKM\TDM and Parking Management Approach to Mode

Policy Framework

City of Portland Comprehensive Plan

The City of Portland's Comprehensive Plan contains statements that guide how the City plans and implements improvements. These statements are ordered from the general to the specific as goals, policies, objectives, and action items. Goals, policies, and objectives are formally adopted by City Council ordinance. Action items are adopted by resolution and provide guidance for future activities.

Most policies relating to transportation are found in the Transportation Element of the Comprehensive Plan, which encompasses Goal 6, Transportation, Goal 11B, Public Rights-of-Way, and the Central City Transportation Management Plan. The Transportation Element has been completely rewritten as part of the TSP, and the policies and objectives that relate to transportation demand management and parking are identified below.

Goal 6 Transportation

Several policies and objectives under Goal 6 relate to transportation demand management and parking. (The complete text is contained in Chapter 2 of this document.)

Policy 6.15, Transportation System Management, states in Objective A:

> Reduce and manage automobile travel demand and promote transportation choices before considering the addition of roadway capacity for single-occupant vehicles.

Policy 6.26, Parking Management, is the overall policy that addresses parking and relates to TPR parking requirements. It states:

> Manage the parking supply to achieve transportation policy objectives for neighborhood and business district vitality, auto trip reduction, and improved air quality.

Objective A of this policy states:

> Implement measures to achieve Portland's share of the mandated 10 percent reduction in parking spaces per capita within the metropolitan area over the next 20 years.

Policy 6.27, On-Street Parking Management, directs the City to:

> Manage the supply, operations, and demand for parking and loading in the public right-of-way to encourage economic vitality, safety for all modes, and livability of residential neighborhoods.

The City's goal is to ensure that on-street parking is provided or retained where it is needed to support economic vitality of established commercial districts and neighborhoods.

Policy 6.28, Off-Street Parking, establishes the policy basis for zoning code regulations for minimum and maximum parking ratios, as required by Title 2 of the UGMFP. Its objectives

address how parking needs vary depending on the availability of transit, and how limitations on new parking can help achieve land use, transportation, and environmental goals. The policy states:

> Regulate off-street parking to promote good urban form and the vitality of commercial and employment areas.

Policy 6.29, Travel Management, is the primary policy addressing demand management and the impacts of traffic and parking, particularly on neighborhoods. The policy states:

> Reduce congestion, improve air quality, and mitigate the impact of development-generated traffic by supporting transportation choices through demand management programs and measures and through education and public information strategies.

This policy and its objectives address the range of measures that reduce the demand for parking and reduce vehicle miles traveled. Transportation demand management measures are key to ensuring the compatibility of institutions with the neighborhoods where they are located. The policy and objectives are implemented through conditional use and impact mitigation plan approval criteria in the zoning code.

Policy 6.34, Congestion Pricing, describes the City's role in supporting a regional, market-based system to price or charge for auto trips during peak hours.

District TDM/Parking-Related Policies and Objectives

District-specific objectives addressing parking and TDM strategies are contained in Policy 6.35 through Policy 6.41 for the seven Transportation Districts: North, Northeast, Far Northeast, Southeast, Far Southeast, Northwest, and Southwest. Selected objectives are listed below; the complete text of district policies and objectives is provided in Chapter 2. Policies for the Central City are discussed separately.

- North – Improve parking management within the St. Johns Town Center and at Portland International Raceway. (Policy 6.34, Objective O)

- Northeast – Work with Tri-Met and businesses to encourage the use of alternatives to automobiles, particularly in the Columbia Corridor, through transit service improvements and incentives and transportation demand management techniques such as flexible work hours, telecommuting, carpooling, and vanpooling. (Policy 6.35, Objective F)

- Far Northeast – Resolve the long-term future of the park-and-ride facility at the Gateway transit center to reinforce the Gateway regional center's long-term vitality. (Policy 6.36, Objective E)

- Southeast – Support the livability of Southeast neighborhoods by improving the efficiency of parking and loading in commercial areas and by reducing commuter parking in residential areas. (Policy 6.37, Objective N)

- Far Southeast – Consider implementing parking controls in the vicinity of light rail stations where commuter parking is impacting nearby residential neighborhoods. (Policy 6.38, Objective E)

- Northwest – Support a range of strategies in the high-density portions of the district parking issues, including commuter and event parking impacts. (Policy 6.39, Objective F)

- Southwest – Evaluate the transportation impacts on adjacent neighborhoods when considering increases in development potential of large new or redeveloping areas, and include mitigation measures in development plans. (Policy 6.40, Objective D)

Goal 11B, Public Rights-of-Way

Policy 11.12, Performance Measures, identifies criteria for measuring progress in achieving transportation goals. Objective E states:

> Use a set of benchmarks to measure progress toward attaining the Transportation Planning Rule goals of reduced vehicle miles traveled per capita and reduced parking spaces per capita.

Chapter 15, System Performance, of Volume II of the TSP contains the benchmarks for this objective and others under Policy 11.12.

Central City Transportation Management Plan

The 1995 Central City Transportation Management Plan (CCTMP) is the transportation system plan for the Central City. One of its primary goals is "minimizing the demand for parking without negatively impacting development opportunities by managing long- and short-term parking and providing incentives to encourage the use of alternative modes." The CCTMP has numerous policies and objectives that address parking and demand management.

The parking policies in the CCTMP are critical in setting the policy stage for the parking regulations found in the Central City Plan District chapter of the zoning code. The concept of the policies is to:

- Constrain the parking supply to encourage the use of alternatives to the automobile.

- Establish a system of parking ratios for office uses throughout the Central City.

- Manage on-street parking to support land use activities and mitigate impacts on adjacent neighborhoods.

The demand management policies of the CCTMP are intended to increase the availability of transit and support ridesharing, walking, and bicycling in the Central City. The emphasis is on supporting new demand management programs and working with Tri-Met and other organizations to promote alternatives to driving.

The mode split policies of the CCTMP establish targets for transit by district and for walk/bike and rideshare for the Central City as a whole. The mode split goal for walk/bike trips is 10 percent for home-based work trip attractions by 2010. The rideshare goal for average auto occupancy is 1.3 person per vehicle for home-based work trip attractions by 2010.

Chapter 2 contains the complete text for the Central City goal, policies, and objectives.

Other TDM/Parking-Related Policies and Objectives

In addition to the Transportation Element, the following Comprehensive Plan policies and objectives address transportation demand management and parking. (Policies and objectives that relate to transit, bicycle, and pedestrian movement are detailed in the modal plans addressing those subjects in this chapter.)

Goal 2 Urban Development.
Policy 2.15, Living Closer to Work of the Urban Development Goal states:

> Locate greater residential densities near major employment centers, including Metro-designated regional and town centers, to reduce vehicle miles traveled per capita and maintain air quality. Locate affordable housing close to employment centers. Encourage home-based work where the nature of the work is not disruptive to the neighborhood.

Goal 5 Economic Development.
Policy 5.4, Transportation System, states:

> Pursue transportation and parking improvements that reinforce commercial, industrial and residential districts and promote development of new commercial, industrial, and residential districts.

Goal 7 Energy.
Policy 7.6, Energy Efficient Transportation, states:

> Promote shared recreational use of school facilities and city parks, close-in recreation opportunities, and improved scheduling of events to reduce recreation-related transportation needs. (Objective D)
>
> Work with the private and public sectors to increase the number of preferentially located parking spots available for carpools. Work with Tri-Met to promote their availability. (Objective I)
>
> Match carpool riders and provide transit information to city employees. Promote public/private partnerships to increase employee ride-share, transit use, and flextime. (Objective J)

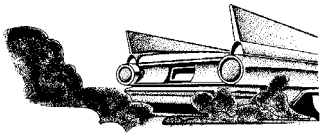
Policy 7.7, Telecommunications as an Energy Efficiency Strategy, and its objectives support telecommunications as a strategy to reduce the need for travel.

> Investigate opportunities for city employees to allow off-site work and telecommuting, when appropriate. (Objective C)

Goal 8, Environment, Policy 8.4, Ride Sharing, Bicycling, Walking, and Transit, states:

> Promote the use of alternative modes of transportation such as ridesharing, bicycling, walking, and transit throughout the metropolitan area.

Existing Conditions



Oregon's primary contribution to global warming is the burning of fossil fuels. Oregon generates about 40 million tons of carbon dioxide (CO_2) a year from all sources, with transportation contributing the largest share (about 53 percent).

One of the most significant barriers to a more sustainable transportation system is how motorists pay (or are subsidized) for their motor vehicle use. High fixed costs to purchase the vehicle, combined with low incremental user costs (e.g., free parking, free roads, and low motor fuel taxes), create hidden subsidies and incentives to driving. People need to know and experience the true cost of driving their cars. Even with these subsidies and low incremental costs, households in the Portland-Salem area spend more of their incomes on transportation than on any other category of expense except shelter.

Portland has a long history of managing downtown parking, adopting the Downtown Parking and Circulation Policy in 1975 (in response to the Federal Clean Air Act) and the Downtown Parking Management Plan. With the adoption of the Central City Transportation Management Plan (CCTMP) in 1995, the City expanded parking controls to the Central City area, while eliminating the 'lid' on parking downtown.

Parking Management Measures (Downtown Portland)

Parking Inventory

As of January 1999, there were 47,394 off-street and on-street spaces in the core area of downtown Portland, including 2,083 future spaces that have been approved by the City. Of the 35,645 existing off-street spaces (garages and lots), 32,194 (90 percent) are for commercial use and 3,451 (10 percent) are for residential and hotel use. Of the 6,215 on-street spaces, most (73 percent) are metered for 1 to 3 hours; only 8 percent are metered for over 4 hours or less than 1 hour. Fourteen percent are located in loading zones, and just over two percent are dedicated to other special zones, such as taxi, carpool, fire, and police.

As of January 1996, there were 8,121 off-street parking spaces in the Lloyd District. Over half (4,274) are located in garages, and over three-quarters (6,905) are for commercial use. The Lloyd District also has 1,118 metered spaces.

Carpool and Vanpool Parking

CITY-OWNED FACILITIES

To reduce the number of vehicles commuting to and parking in the Central City, the City offers conveniently located parking at a reduced rate for carpools. Tri-Met carpool staff

administer the various Central City carpool programs, using the spaces provided by the City. There are 1,284 carpool spaces available, and 889 of these are used.

PRIVATELY OWNED FACILITIES
Eight privately owned downtown surface lots currently provide a total of 150 carpool parking spaces. This program has reduced the number of vehicles commuting to downtown by approximately 80 vehicles.

SMARTPARK GARAGES
The City of Portland operates a system of six short-term parking garages downtown, providing over 4,500 parking spaces.

PARKING METER DISTRICTS
There are currently two parking meter districts in the City, one downtown and one in the Lloyd District. The districts are managed in accordance with the City's Parking Meter District Policy.

Area Parking Permit Programs

There are currently eight area parking permit programs – Goose Hollow (Zone A), Gander Ridge (Zone B); Homestead (Zones c, D and E); Lair Hill (Zone F); Central Eastside(Zone G); Northwest (Zone K). Expansion of the Northwest program is considering expanding its boundaries. Zone B will have its hours of operation expanded to include evening hours. Zone G boundaries may expand to SE 12th Avenue. Sullivan's Gulch and Irvington are considering permit programs in response to the recent expansion of Fareless Square to Lloyd District.

Transportation Management Associations

A transportation management association (TMA) is an organization of interested people – employers, institutions, and others – working together to address local transportation problems. There are five official TMAs in the region; of these, three are in Portland (Lloyd District, Columbia Corridor, and Swan Island.) The City's role is to provide technical assistance and funding. The operations funding for TMAs comes from the City, business improvement districts (if applicable), regional funds administered by Tri-Met, and private employer contributions.

Lloyd District Transportation Management Association
The Lloyd District TMA was formed in 1994, with federal and City of Portland resources, to provide trip reduction programs for employers in the Lloyd District. Trip reduction programs were critical to manage the access, mobility, and congestion problems expected to occur with the rapidly growing population and employment base in this business district. The TMA membership has developed from 10 to over 35 businesses, with a 12-member board of directors.

The TMA's focus includes improved public transit; ride sharing; alternative work hour programs; and programs promoting parking management, bicycle, and pedestrian measures. To accomplish these goals, the TMA partnered with the City of Portland and Tri-Met to develop the Lloyd District Partnership Plan, which includes the following elements:

- Implementation of Tri-Met's discounted employer transit fare program. Called PASSport, this program currently provides annual passes to over 44 employers in Lloyd District. In 2000, 6,000 employees participated, resulting in a reduction of nearly 4 million vehicle miles traveled annually.

- Implementation of a bicycle promotion and facilities improvement plan, resulting in a 38 percent increase in weekly bicycle trips since 1999 and the addition of 66 new bicycle parking spaces.

- A marketing and communications program, which has resulted in:

  - Thirty-five transit fairs and brown bags conducted at work sites within the Lloyd District since 1997, reaching over 3,000 employees.

  - Development of promotional and educational materials, which target employers looking for programs to help their employees use alternative transportation modes, and provide information and to employees about the variety of transportation options available to them.

  - Information centers, transportation coordinators, and a website to help the TMA provide information to district employees.

- Improved transit service for Lloyd District employees, including two new limited-stop, express route buses to the core of the Lloyd District; extension of Fareless Square to the Lloyd District; and the addition of Airport MAX service to the core of the Lloyd District.

The TMA also implements projects approved by the Lloyd District Revenue Allocation Committee. A portion of parking meter revenues is used to support implementation of the Lloyd District Partnership Plan, as well as to fund a number of other transportation-related projects and programs. The TMA recently voted to expand its services to include marketing and public safety.

Transit Management Alliance

The Transit Management Alliance is a program of the Columbia Corridor Association, an advocacy group for business and development interests in the Columbia Corridor. The Transit Management Alliance works with local businesses to create and promote commute options that improve employee access to Columbia Corridor businesses. The present area of focus is the airport area (north of Columbia Boulevard and Sandy Boulevard, from NE 33rd Avenue to NE 185th Avenue). The Transit Management Alliance operates a shuttle within the area bounded by NE 82nd Avenue, NE Airport Way, I-205, and NE Columbia Boulevard. Last year, the shuttle reduced vehicle miles traveled in the area by 10,008. The Transit Management Alliance is partially funded by regional transportation funds administered by Tri-Met.

Swan Island Transportation Management Plan

The Swan Island TMA began in 1999 and is partially funded by regional transportation funds administered by Tri-Met. Because there is limited access to major employers on Swan Island (such as Freightliner, UPS, Wanke Cascade, and WW Grainger), a major activity of the TMA is the ongoing effort to inform employers and employees about transportation options. In

2000, the TMA held over 20 transportation fairs to promote transit, the carpool incentive program, evening shuttle, and Car Free/CareFree week. The carpool incentive program encourages the use of commuter carpools, with a focus on swing and graveyard shifts. Funded by a regional Job Access grant, this program now has over 200 individuals registered in 100 carpools. An evening shuttle service links swing shift and graveyardshift employees to bus and MAX service from the Rose Quarter. The TMA also contracts with C-Tran to provide direct commuter service form Clark County. Swan Island programs have reduced annual vehicle miles traveled by 259,989.

Marquam Hill Transportation Partnership Plan

Adopted in August 1995, the Marquam Hill Transportation Partnership Plan is a joint effort to address transportation and parking problems on Marquam Hill and reduce auto trips to the area. The partners are:

- Oregon Health Sciences University
- Shriners Hospital for Crippled Children
- Veterans Affairs Medical Center
- Tri-Met
- City of Portland

The plan addresses regional ridership, mode split targets, local transportation and parking requirements, and the transportation needs of Marquam Hill. A Marquam Hill Oversight Board, with representation from the partner organizations and the Homestead neighborhood, was established to supervise implementation of the plan.

Major elements of the plan include:

- Introduction of an annual all-zone transit pass program, which health care providers make available to employees and students free or at a reduced price
- Introduction of three new am/pm direct express bus routes to Marquam Hill
- Introduction of a carpool matching program
- Introduction of a subsidized vanpool program
- Intensive use of marketing to promote the transit pass program, emergency ride home program, carpool and vanpool matching service, and new bus routes

The various data sources used to track progress and evaluate impacts of the plan indicate significant declines in the drive-alone mode and significant increases in transit usage. The plan is demonstrating that the strategies of a free transit pass, convenient bus service, strong marketing promotion of express bus service, promotion of carpooling, the availability of emergency ride home service, limited parking supply, and fees for parking can shift commuters from driving alone to other modes.

Car Sharing

Car sharing decreases auto dependence, VMT and vehicle emissions. It allows an individual to have the benefits of auto use, when needed, without the drawbacks of car ownership

(insurance, maintenance, car storage). While car ownership strongly encourages auto use, car sharing promotes auto use as one transportation option, along with transit, carpooling, biking, or walking.

The City recently promoted and coordinated a multi-agency effort to develop the first successful car sharing organization in the United States, which has become a model for car sharing organizations throughout the country. As of 2001, CarShare Portland operates 28 vehicles from 25 locations and has about 525 members. CarShare has been purchased by Flexcar of Seattle, which will expand the number of locations where its members can access vehicles.

Existing Deficiencies

Future population and employment growth projections indicate an increasing need to continue and expand on existing TDM programs and develop new programs, such as the web-based carpool/vanpool matching service, that will encourage a reduction in drive-alone trips. Parking limitations and pricing strategies will continue to be effective tools for reducing congestion and emissions.

Non-work trips that contribute to congestion and air pollution can be reduced y expanding Portland's TDM efforts into education, outreach, and neighborhood trip reduction programs.

Issues from District Needs Assessment

In fall 1998, the Portland Office of Transportation (PDOT) held TSP workshops in each of the Transportation Districts to gather information about transportation issues and community needs. Participants were asked to identify needed transportation improvements in their neighborhood and indicate their top three priority issues, or 'transportation values.'

Two of the top seven values identified in the workshops relate directly to transportation demand management: manage congestion and provide more transportation choices. Managing congestion was especially important in the Northwest, Northeast, Far Northeast, and Far Southeast Districts. Providing more transportation choices was a top priority in the Southeast District.

Systemwide Needs

The City was a partner with Metro and other local jurisdictions in a demonstration project financed by the Federal Highway Administration (FHWA) to determine if pricing roadways during peak traffic hours can help reduce congestion. Peak-period pricing is very effective in reducing congestion and improving mobility while limiting vehicle miles traveled and the need for new roads. Called the Traffic Relief Options (TRO) Study, the project was completed in spring 1999. The TRO Task Force recommended not to support peak-period pricing on existing roadways at that time. It recommended choosing a demonstration project for a new facility or new capacity on an existing roadway within two years.

Implementation Measures

Existing Regulations

Effective parking management has been part of the City's efforts to promote livability and economic vitality for many years. Existing parking regulations vary across the City.

Parking in the Central City is governed by a complex set of regulations intended to promote the use of alternative modes, support existing and new economic development, maintain air quality, and enhance urban form. These regulations were adopted as part of the 1995 CCTMP. Varying regulations and approval criteria apply, depending on whether the parking is to support existing or new development, is commercial parking not associated with a specific use, or is parking within a certain distance of light rail or the transit mall. A set of parking ratios limits the amount of parking for all uses downtown and for office uses in other districts of the Central City.

More recently, special parking regulations have been adopted for the Gateway plan district, Cascade/PIC plan district, and the Hollywood plan district. The intent of these regulations is to limit the amount of surface parking in order to support a compact urban form and reinforce use of transit and light rail. Light rail serves all three of the plan districts.

In October 2000, the City adopted new parking regulations to meet the requirements of Title 2 of the UGMFP. Because of the extensive parking regulations that had already been adopted, the City made only a few changes for the Central City. For the most part, the City's parking minimums were already consistent with Title 2 ratios. Several zones already allowed development without parking, and central employment (EX) and commercial office(CO1) zones were added. In addition, the minimum parking requirement for residential uses in the core area of the Central City plan district was eliminated.

Parking maximums already existed for all uses downtown; office uses in most other Central City districts; the Gateway, Cascade Station/PIC, and Hollywood plan districts; and EX and neighborhood commercial 1 (CN1) zones. The Citywide Parking Ratios Project adopted in 2000 added parking maximums for office uses in Central City districts that did not already have them (except North Macadam, which is establishing parking maximums through a separate process), and for most uses in all other areas of the City. The UGMFP suggests a two-tier approach to parking maximums. The City chose instead to apply one standard, but allows a higher parking maximum through a zoning code exception for areas located more than ¼ mile from 20-minute peak-hour bus service or ½ mile from a light rail station. Structured parking is exempt from parking maximums, except for colleges and other institutions or where plan district regulations do not exempt them.

Through conditional use and conditional use master plan reviews (Chapters 33.815 and 33.820 of the zoning code), conditions of approval are often placed on large institutions, such as churches and colleges, to require a transportation demand management plan. The TDM plans are tailored to each institution to ensure that transportation impacts can be mitigated over time as the institution grows. Impact mitigation plans (similar to a conditional use master plan) specifically require TDM plans. Policy 6.29, Travel Management, of the Transportation Element of the Comprehensive Plan, supports the TDM plan requirement.

Proposed Code Changes

Chapter 6, Implementation Strategies and Regulations, contains the new Title 33, Planning and Zoning, language that specifically requires TDM plans as part of conditional land use reviews. This language makes it clear that TDM plans are an important part of the transportation strategy to support large institutions and other uses.

To comply with the UGMFP Title 2 requirement that parking lots over three acres in size have 'street-like features', new regulations are being added to Title 33. In addition to the 'street-like features', these large parking lots must have their 'streets' or driveways spaced to meet the connectivity requirements (every 530 feet) contained in the 2000 RTP.

To encourage carsharing, incentives are being considered to encourage developers to provide parking for carsharing vehicles. A pilot project to allow carsharing vehicles to have designated on-street parking may be expanded to apply more widely.

Projects

The City will continue to support existing TMAs in Gateway, Swan Island, the Columbia Corridor, and Marquam Hill, as well as the development of new TMAs in other areas. The structure and the types of City participation differ for each TMA. City involvement may include funding, advice about forming the TMA, serving on the membership board, policy development, project development, and other technical support. In exchange for the City's support, the TMAs provide outreach services.

The TSP project list includes financial support for TMAs. The RTP and TSP project lists both include the following TMA projects (not listed in order importance or funding priority):

- North Macadam (Project No. 20041)
- Lloyd District (Project No. 20032)
- Gateway regional center (Project No. 50021)
- Swan Island (Project No. 30052)
- Columbia Corridor (Project No. 40033)

Programs and Strategies

The City of Portland currently implements a number of trip reduction programs to reduce congestion and improve air quality. This section identifies existing programs that should be continued and expanded, as well as new programs and strategies to support the City's parking management and TDM goals and objectives.

Parking Meter Districts
Parking meter districts are managed according to the district's parking management needs. By requiring users to pay to park, meter districts encourage the public to consider alternatives to driving to these districts.

Parking meters can be a useful tool for discouraging commuter or special event parking and ensuring that customer or residential parking is available in a timely manner. Generally, the lowest priority is to allow all-day on-street parking by commuters. The City will continue to explore opportunities for installing on-street parking meters in business districts of the Central City and in other inner-city commercial and residential areas.

In less dense commercial areas, on-street parking is managed with signage that limits the time a vehicle can park. It is difficult to effectively enforce these time limits without high-cost staffing to document violations. Parking meters are a more efficient and effective technique for achieving turnover of parking spaces.

Although meter districts are a source of revenue for the transportation system, the rates are set to support the economic vitality of the commercial district or to allocate scare parking resources, rather than primarily to generate revenue. The revenues go first to pay for capital and operating costs of the meter system. Operating costs include initial costs to mitigate parking impacts on adjacent neighborhoods if that should occur. After capital and operating costs are covered, remaining revenues may be allocated to support transportation services within the district and potentially citywide. These transportation services may include:

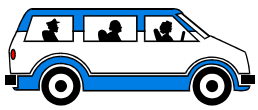
- Improvements in adjacent neighborhoods to offset the direct impacts of the meter district
- Public education programs to promote non-auto modes of travel
- Improvements to the pedestrian environment
- Maintenance and improvement of the right-of-way within the district
- Development of short-term off-street parking facilities
- Promotion of transit service and support of alternatives to standard transit service
- Programs to reduce the demand for parking

SmartPark Garage System

The City of Portland develops and operates a system of short-term parking garages that provide affordable parking for retail shoppers and visitors to the downtown area. This helps encourage downtown visitors, increase downtown viability and opportunities for development, and reduce auto emissions (since shoppers are less likely to circle City blocks in search of an on-street, metered space). Net revenue from the SmartPark system is used to finance a variety of transportation-related projects, such as the streetcar.

Carpools and Vanpools

Several carpool programs in Portland are designed to reduce the number of vehicles commuting to and parking within certain areas of the City. Carpooling is encouraged as an alternative to single-occupant commuting, especially for people traveling from destinations not well served by transit.



The City has partnered with Tri-Met since 1977 to offer discounted parking for carpoolers to downtown and the Lloyd District. The City provides both off-street and on-street parking spaces, while Tri-Met administers the monthly permit program and assists with carpool matching and marketing through employer outreach efforts. Carpoolers must carpool with the required number of members – (two or three-plus members, depending upon parking facility requirements) at least one way to or from work or school, at least four days a week.

Another City program establishes downtown carpool parking locations on privately owned surface lots, in accordance with a CCTMP requirement. Private operators contract with Tri-Met to sell carpool permits at a discounted price for a small number of spaces on each lot, subject to the CCTMP requirement. Some new development is also required to set aside carpool spaces in private parking facilities.

The City of Portland and Tri-Met have also developed an employer-paid carpool subsidy program called CarpoolCheck. The subsidy can be used by carpoolers in programs managed by Tri-Met, or used to pay private parking operators. Tri-Met manages CarpoolCheck, and five Central City employers (including the City of Portland) participate.

The City of Portland is currently developing a web-based ridesharing system. A coalition of over 20 public, private, and non-profit organizations participate in this project, which began September 1, 2001. CarpoolMatchNW.org is a self-serve, internet-based service that links riders and drivers from Salem to Vancouver, Washington. All transit, rideshare, and TMA organizations between Salem and Vancouver will be tied into this carpool/vanpool matching tool.

This new service addresses the three barriers to conventional carpool matching programs:

1. It is anonymous, so people can feel secure about finding fellow car and vanpoolers.

2. It is user-driven and does not depend on a coordinator to find suitable riders.

3. It is fast and convenient. People can find other riders in a few days, rather than in weeks or months.

Carpool, vanpool, and rideshare efforts should continue and expand in the following ways:

- Continue to explore opportunities to provide preferential carpool spaces on-street and in private parking facilities and public garages.

- Explore the possibility of a “School-Pool Program,” using the web-based rideshare system, for parents who drive their children to public and private schools. The School-Pool program would reduce the vehicle trips generated by parents whose children cannot walk or bicycle to school.

- Explore opportunities for turning small plots of temporarily unused land (such as ramps near highway projects, vacant lots, and land slated for new facilities) into vanpool parking lots. The spaces would ideally be available for about one year, with each parking lot eventually reverting to its owner for other uses.

- Explore opportunities to create vanpool loading zones in appropriate areas throughout the City.

Area Parking Permit Program

The Area Parking Permit Program (APPP) is used to control on-street commuter parking in areas adjacent to large employment centers, large attractions, or near major transit facilities. The program converts the on-street system to a limited time zone for all vehicles without permits. Permits are issued to residents and employees of the permit area. This program keeps out-of-district commuters from parking for free, then leaving the area to work, attending an event, or take transit to their final destination. The City has 10 programs bordering downtown and one in the Central Eastside Industrial District. Several more programs are under consideration.

Expanded Fareless Square

The fareless transit area, in place in the Central City since the late 1970's, expanded to a portion of the Lloyd District in September 2001. The program is funded by a combination of parking meter revenue, Tri-Met, and the Lloyd District TMA.

Recent planning for the Gateway regional center has included support for a 'circulator' – either a free bus that travels within the center or a combination of transit services that residents and employees could use within the area. Portland will continue to work with Tri-Met to develop this concept so some form of a fareless area will be in place by 2020. Fareless areas must meet Tri-Met criteria, such as having transportation and parking management plans, fees for parking, and an analysis of the costs and benefits to Tri-Met and the region.

Neighborhood-Based Programs

NEIGHBORHOOD RIDESHARE

Using federal funds, the City tested neighborhood-based rideshare matching and promotion as a possible way to overcome the barrier of sharing a ride with strangers and increase rideshare participation. Conducted with Central Northeast Neighbors, the project ended December 1998. It effectively showed the ability of a neighborhood to organize around the transportation needs of its residents and reduce SOV traffic from the neighborhood. Although there was interest in continuing the program, no funding is available at this time.

WALKING, BICYCLING, TRANSIT PROMOTION EVENTS

Bicycling and walking tours are held during the summer months to promote these modes. The Summer Cycle 2001 rides taught skills that make it easier to incorporate cycling into daily activities. Summer Walks 2001 tours showed people what makes Portland's neighborhoods livable and enjoyable to walk in.

NORTHWEST/RIVER DISTRICT TRANSPORTATION OPTION PLAN

The Northwest/River District Transportation Option Plan was developed to celebrate and encourage use of the Portland streetcar and other transportation options. The plan kicked off in July 2001 with the opening of the streetcar line, and is valid through December 2001. A central piece of the plan is the transportation options card, an incentive for residents of Northwest Portland to try one or more transportation options. The card is available to the first 1,000 residents who answer a short survey and order the card. It provides one-time offers of a free month transit pass, free use of the Portland streetcar, bike locker and Bike

Central discounts, and a CarSharing Portland membership discount. Six months after the card expires, the City will evaluate its use and its success as an incentive to try new transportation options.

City of Portland Employee Programs

TRIP REDUCTION INCENTIVE PROGRAM

The City of Portland began the employee Trip Reduction Incentive Program (TRIP) in 1995. TRIP includes a $25 per month (pre-tax) bus pass and carpool parking subsidy. There are approximately 2,700 employees in downtown work sites and over 1,400 participants in some element of the program. Transportation's Bureau of Maintenance has a separate 'Passport' program that provides a 100 percent subsidy to its employees.

In addition to the transit and carpool elements, the City created a Bike and Walk Commuter Program in 1999 to offer City employees $25 of additional (taxable) income per month. Employees who walk or bicycle to work at least 80 percent of their scheduled workdays are eligible for this benefit. The over 100 participants have reduced vehicle miles traveled in 2000 by 130,000.

As a result of these subsidies, City employees in the downtown complex have reduced their weekly auto trips by 20 percent. The auto trip rate before the program began has dropped from 33 percent to 26 percent, exceeding the target auto trip rate of 29 percent.

ALTERNATIVE WORK HOURS AND TELEWORK

Many employees work modified schedules or flex their schedules on an irregular basis. Telework is another management tool that can be used to increase productivity, reduce employee commute trips, and accommodate special needs of employees by allowing employees to work out of their home for part of the week.

The City of Portland adopted guidelines for a Telework program in 1995. These were updated and amended in 1996 and apply to all permanent City employees. Although not yet used extensively, the Telework program has demonstrated increased productivity, better time management, opportunities to balance home and work responsibilities, trust between managers and employees, employee retention, and improved employee morale. The Office of Transportation is developing a recommendation and proposed pilot program to implement the Telework program.

Clean Air Action Days

Clean Air Action (CAA) Days are days of voluntary action to reduce ozone precursor emissions (volatile organic compounds and nitrous oxides). When temperatures reach 90 degrees, the City, along with DEQ and other partners in clean air, promote actions and messages to encourage people to get to work without driving.

Education

During development of the TSP, the community expressed strong support for education activities for children and adults, with the emphasis on transportation choices and safety. Portland's transportation system includes nearly 300 miles of bikeways and 3,000 miles of sidewalks, as well as pedestrian trails, a state-of-the-art transit system, carsharing, and one of the first web-based ridesharing systems in the country. It is critical for residents and visitors to know about the options that are available.

PUBLIC SCHOOLS

Approximately five years ago, the City's Bureau of Traffic Management hosted a 'Reclaiming Our Streets' community forum at the Oregon Convention Center and designed the 'Reclaiming Our Streets' implementation guide. This guide outlines numerous trip reduction, education, and outreach activities to help promote the use of non-SOV transportation modes. The guide's education section recommends curricula for K-5, middle school, and high school.

The current 'Kids on the Move' K-5 education program focuses on safety, primarily because safety was the basis for a National Highway Traffic Safety Administration grant that helps fund the program. The curriculum also integrates lessons on alternatives to the SOV.

All five school districts within the Portland city limits have adopted the K-5 'Kids on the Move' curriculum. PDOT staff and police officers conduct bicycle and pedestrian safety workshops at the elementary schools, and 'Slow Down' banners are placed near the schools targeted for the workshops. During the summer, PDOT and the Bureau of Parks and Recreation conduct safety training at over 30 parks in the Play It Safe program.

The middle and high school curricula are being developed with interactive support programs, with implementation planned for 2002 and 2003. The long-term goal for the education program is to bring about behavior change by teaching children the impacts of their transportation choices. The curricula integrate messages that support alternatives to the automobile based on safety, health, and environmental considerations. io

OTHER EDUCATION PROGRAMS

PDOT also conducts several ongoing programs in cooperation with other organizations and agencies.

- BTA Middle School Bike Safety Curriculum: PDOT staff work with the Bicycle Transportation Alliance (BTA) on community outreach events in conjunction with BTA's curriculum and training program.

- Portland State University Transportation Class: A class taught in the spring and fall targets citizens and PSU students interested in how transportation works in Portland. PDOT staff act as guest speakers and participate in review of student projects.

- Police Activities League: PDOT participates in education activities aimed at disadvantaged youth.

- After Schools Programs: PDOT staff works with the Bureau of Parks and Recreation and the Community School Program to teach children about alternatives to the automobile.

Outreach

PDOT creates various written materials on transportation topics, including newsletters and promotional brochures. A web-based site (GettingAroundPortland.org) offers a wide range of transportation options available to residents and visitors, as well as on-line safety guide to biking, walking, riding the bus, and driving.

Special events throughout the year include summer cycle and walk events designed to teach people safe and convenient places to ride or walk in their neighborhoods. PDOT also participates in numerous special events at schools, transportation fairs, and parades.

Partners for Smart Commuting
Partners for Smart Commuting is a consortium of approximately 30 public agencies in Oregon and Washington. The group includes transit agencies, cities, counties, and state agencies, as well the participation of interested transportation management associations.

The main goal of Partners for Smart Commuting is to raise awareness about the effects of driving alone to work, such as air pollution, traffic congestion, gasoline dependence, and costs. Because the group members provide alternative transportation and promote energy conservation and environmental stewardship, they are dedicated to making an impact on people's transportation choices. By working together, the members can combine limited resources to help deliver an effective message through public service advertising.

Connections
The Connections program identifies problem areas, makes physical improvements (such as crosswalks, bus pads or shelters, improved signage, signal timing changes, audible signals, and tactile strips for the visually impaired), and completes missing segments of the existing citywide bikeway network. The program informs the most affected residents about the improvements and encourages their use by offering an incentive or promoting the improved access.

This approach can be used in a selected area or in conjunction with a larger capital project. One example is the linking of a Connections program to the opening of the Portland streetcar. PDOT coordinated marketing with Tri-Met and Portland Streetcar, Inc. to inform citizens about all their transportation options. This partnership program included improvements to other transit service and enhanced transit customer facilities: more shelters, signs, maps, and schedules at bus and streetcar stops; additional CarShare locations; additional bike racks; and a reinvigorated retail customer shop-and-ride program. The transportation options card was included as a key promotion incentive, offering the first 1,000 residents who signed up a free Tri-Met pass, streetcar pass, bike locker and Bike Central discounts, and CarSharing discount.

Future Projects and Programs

Transportation Center - Mobile Unit, Web Site, and Downtown Site
The Transportation Center is visualized as a place where Portland residents and visitors can learn about the variety of transportation options available to them and how to use them. The center will bring transportation partners together in a virtual and physical location. Using state-of-the-art technology, graphics, promotional opportunities, and events, this space will promote walking, cycling, transit, electric vehicles, trains, and the smart use of cars. It will have three different types of presence.

- A physical storefront, preferably downtown near light rail and streetcar
- An e-mobility center that uses the internet/web and kiosks at key locations to offer an easy information resource

- A mobile, traveling display with the same look and feel as the physical site, offering targeted information and services to specific audiences while promoting the web and downtown center

TravelSmart

The City is proposing a pilot project to test a pioneering method to reduce travel demand. Because changing travel behavior is a difficult task, this project will go beyond the customary approach of trying to bring messages about smart travel choices to individuals through advertising, public service announcements, workplace programs, and other traditional avenues.

Called 'TravelSmart', this approach has been implemented in South Perth, Australia, where it achieved a documented 14 percent reduction in VMT. It uses telemarketing to identify individuals interested in changing their travel habits. Based on the interest shown by the consumer, it then responds with individualized services about walking, cycling, or using public transportation. These services include information, follow up, and even home visits by trained volunteers to assist and motivate people to use their travel choices.

By focusing on willing participants, TravelSmart targets the people who are open to making changes in the way they travel and connects them with the resources they need. The TravelSmart Portland proposal will apply this approach for the first time in the United States.

Potential Strategies

Distance-Based Insurance

A truly efficient system of auto insurance would charge each driver a per-mile charge, based on the probability of having an accident as a result of driving an additional mile. This per-mile fee would differ by driver, based on driving records and other personal characteristics, the type of car driven, and the areas where most of the driving occurs (as is the case with insurance at present). A low-risk driver would have a lower per-mile (or per-minute) rate, while a driver in a high-risk class would have a higher per-mile (or per-minute) rate.

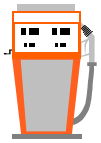
VMT or Emission Fee

No VMT or emission fees currently exist in Oregon. However, the concept is raised periodically as a potential method to reduce auto use. Many agree that the only real way to get people to leave their car at home is to make it more expensive to drive. Such a fee would be based on VMT, auto emissions, or a combination of both.

Parking Pricing and Taxation

The relationship between charging for parking and reduced auto use has long been established. It has been cited as one of the reasons for the high use of transit in downtown Portland. Additional parking charges or taxes have been suggested as a way to encourage alternatives to the auto in other parts of the region.

Gas Taxes



Gas taxes also increase the cost of driving and therefore reduce auto use. Because gas is still relatively inexpensive in this country, however, it would take significant increases in gas taxes to make an impression on the average driver.

Parking Cash-Out

Free employee parking has been shown to be important in an individual's decision to drive to work versus take another mode. Parkingcash-out establishes a parking fee for employer-provided commuter parking and provides a transportation allowance that employees can use to pay for parking or transit, as a supplement to carpool or vanpool use, or as an incentive to walk or bike to work.

Location-Efficient Mortgage Program

The City is currently working with a group of housing and transportation agencies to study the value of the location-efficient mortgage (LEM) in the Portland area. LEM is a lending practice that increases the borrowing power of potential homebuyers in 'location-efficient' neighborhoods. Location-efficient neighborhoods are pedestrian-friendly areas with easy access to public transit, shopping, employment, and schools. The LEM recognizes that families can save money by living in location-efficient neighborhoods because the need to travel by car is reduced. Instead of owning two cars, a family could get by with one or none.

Potential benefits are support for transit-oriented development, reduced parking demand and requirements, and improved opportunities for home ownership. The work group is pursuing funding for a feasibility study, to be followed by a design and implementation phase.

Green Vehicles

Neighborhood electric vehicles (NEV) are designed for short daily trips within neighborhoods. The system is integrated with private vehicles and public transportation to reduce the burden that conventional vehicles place on the environment and alleviate various transportation problems, such as parking space shortages and traffic congestion, without making transportation less convenient. Twenty-five communities have tested NEVs, allowing residents to use the vehicles for all their daily needs for two weeks.

Existing research supports the implementation of NEVs. Fifty percent of all travel is less than 10 minutes in duration, and 80 percent of all trips are within 10 miles of home. Short, start-and-stop trips in conventional vehicles result in many cold starts and unnecessary hydrocarbon emissions, which can be alleviated with the use of NEVs.

Conclusion

Portland has long supported policies and programs to reduce transportation demand, and the region has adopted a policy of minimizing construction of new roads. Despite these efforts, however, vehicle miles traveled in the region continue to grow, and roads and highways are more congested than ever. As more people move to Portland and drive automobiles, the amount of CO_2 and other harmful emissions climbs. It is difficult to change individual behaviors to drive smarter and use alternative modes of transportation.

Current available funding is inadequate to implement the range of projects, programs, and strategies that can successfully reduce vehicle miles traveled and congestion. More money is spent each year in the United States to market the use of the automobile as the primary means of transportation than is spent to fund operations for all the transit systems in the country.

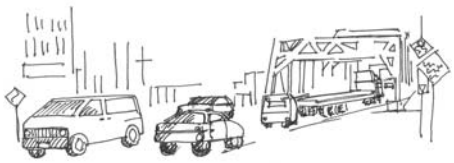
New legislation and the removal of barriers to TDM are needed to implement some of the more innovative approaches. A few examples of supportive legislation proposed in the most recent legislative session are parking cash-out, distance-based insurance, a bicycle commuter bill, and a business energy tax credit expansion.

No one approach to demand management will address the variety of reasons that the automobile is the mode of choice for most trips. Reducing the number and length of trips and/or changing the choice of trip mode will continue to be a challenge until motorists bear the true cost of driving and safe and convenient alternatives are widely available throughout the region. Portland will continue to take a leadership role in promoting TDM as one of the most cost-effective ways to address congestion, air quality, and livability issues.

TRANSPORTATION SYSTEM MANAGEMENT PLAN

Introduction

The size and complexity of our transportation network, expected regional growth, implementation of the 2040 Growth Concept, and the range of competing transportation system users create a challenge to Portland's livability and mobility. Increased demand on the transportation system will increase congestion unless preventive measures are taken.



Transportation system management (TSM) strategies provide a viable alternative to costly new construction or road widening projects. The City's Office of Transportation uses TSM to increase the efficiency, safety, or flow of traffic on transportation facilities. Like transportation demand management (discussed in a separate TDM/parking modal plan), TSM can optimize the performance of the City's transportation network without adding new infrastructure that is often much more expensive and disruptive while being constructed. Added capacity is gained through TSM measures such as intelligent transportation systems, facility design and modification, access management, signal timing changes and phasing, transit priority treatments, and other operation-oriented strategies. Other strategies, such as traffic calming and safety measures, support livability.

Requirements

Transportation Planning Rule

The state Transportation Planning Rule (TPR) requires jurisdictions to evaluate the potential for transportation system management measures to address transportation needs. The TPR defines TSM measures as

> . . . techniques for increasing the efficiency, safety, capacity or level of service of a transportation facility without increasing its size. Examples include, but are not limited to, traffic signal improvements, traffic control devices including installing medians and parking removal, channelization, access management, ramp metering, and restriping of high-occupancy vehicle (HOV) lanes.

The TPR defines access management as

> . . . measures regulating access to streets, roads and highways form public roads and private driveways. Measures may include but are not limited to restrictions on the siting of interchanges, restrictions on the type and amount of access to roadways, and use of physical controls, such as signals and channelization including raised medians, to reduce impacts of approach road traffic on the main facility.

The TPR requires new connections to arterials and state highways to "be consistent with designated access management categories." Jurisdictions are required to adopt measures to "limit unintended effects on travel and land use patterns including access management."

The TPR requires "for areas within an urban area containing a population greater than 25,000 persons a plan for transportation system management and demand management." Portland is separating this plan requirement into two modal plans: one for TSM and one for TDM/parking.

2000 Regional Transportation Plan

The City's Transportation System Plan (TSP) must be consistent with the TSM policies of the 2000 Regional Transportation Plan (RTP). Policy 18.0, Transportation System Management, of the RTP supports the use of TSM techniques to optimize performance of the region's transportation systems. The RTP emphasizes mobility on road segments between 2040 Growth Concept primary land use components, and access and livability within these designated areas.

The objectives of Policy 18.0 emphasize:

a. Through-travel on major routes that connect the Central City, regional centers, industrial areas, and intermodal facilities

b. An integrated, regional advanced traffic management system program to address:
   - Freeway management, such as ramp meters and automated incident detection
   - Arterial signal coordination, such as comprehensive signal timing
   - Transit operations, such as computer-aided fleet location and dispatch
   - Multimodal traveler information services, such as variable message signs

c. Access management plans consistent with regional street design concepts

d. Integration of traffic calming into new street designs

e. Minor reconstruction consistent with regional street design to address roadway safety and operations

Section 6.6.3, Congestion Management Requirements, of the RTP apply to any amendments to the RTP to add significant single-occupancy vehicle (SOV) capacity to multimodal arterials and/or highways. Several factors must be considered before capacity is added. One of these factors is "regional transportation system management strategies, including intelligent transportation systems."

The Portland TSP must comply with the elements of Section 6.7, Project Development and Refinement Planning, of the RTP. The development of projects that are on the regional system, but not identified as projects in the RTP, and not locally funded must include the following considerations:

> . . .cities, counties, Tri-Met, ODOT, and the Port of Portland shall consider the following project level operational and design considerations during transportation project analysis: 1) Transportation system management (e.g.,

access management, signal interties, land channelization, etc) to address or preserve existing street capacity; 2) Street design policies, classifications and design principles.

This requirement is considered guidance for locally funded projects, rather than as a requirement.

Oregon Highway Plan

The 1999 Oregon Transportation Commission requires local and regional TSPs to be consistent with certain policies of the Oregon Highway Plan. The policies applicable to TSM are 3 A through E: Access Management.

- Policy 3A describes how the state will "manage the location, spacing and type of road and street intersections and approach roads on state highways to assure the safe and efficient operation of state highways consistent with the classification of the highways." State highways are classified for varying degrees of access management.

- Policy 3B addresses the use of medians.

- Policy 3C describes access management at interchanges.

- Policies 3D and 3E describes how 'deviations' and 'appeals' to the access management standards are dealt with. The standards are contained in Appendix C of the Oregon Highway Plan.

Approach to Mode

The City's primary approach to managing increased congestion is to manage existing transportation facilities more efficiently. The focus is on using TSM strategies to ensure the optimum efficiency of the City's transportation network and support economic vitality and neighborhood livability.

The objectives of this approach are to:

- Manage operations of the street system to maintain acceptable levels of service on major arterials that connect the Central City, regional centers, industrial areas, and multimodal facilities.

- Coordinate with regional partners to develop an integrated, advanced traffic management system to ensure optimum efficiency and mobility during the morning peak-period incidents.

- Coordinate arterial and freeway operations with other agencies to ensure efficient operations of both types of facilities.

- Develop system management programs that provide flexibility in addressing anticipated future traffic growth with the implementation of the 2040 Growth Concept and other local land use decisions.

- Establish a transportation system management program that provides both mobility and accessibility for people, freight, and goods at all times.

- Reduce and manage automobile travel demand, and promote transportation choices, before considering the addition of roadway capacity for single-occupant vehicles.

- Employ transportation system management measures to improve traffic and transit movements and safety for all modes of travel, including coordinating and synchronizing signals.

- Integrate traffic calming elements into facility design and modifications to manage traffic on Neighborhood Collectors, Local Service Streets, along main streets, and in centers, consistent with their street classifications, functions, and desired land uses.

- Coordinate with the Oregon Department of Transportation (ODOT) to develop access management measures that do not adversely impact any transportation mode and are consistent with the functional classifications of the street where these measures are applied.

Policy Framework

City of Portland Comprehensive Plan

The City of Portland's Comprehensive Plan contains statements that guide how the City plans and implements improvements. These statements are ordered from the general to the specific as goals, policies, objectives, and action items. Goals, policies, and objectives are formally adopted by City Council ordinance. Action items are adopted by resolution and provide guidance for future activities.

Transportation Element Policies and Objectives

The Comprehensive Plan addresses a broad range of goals for the City. Most policies relating to transportation are found in the Transportation Element of the Comprehensive Plan, which encompasses Goal 6, Transportation; Goal 11B, Public Rights-of-Way; and the Central City Transportation Management Plan (CCTMP). The Transportation Element has been completely rewritten as part of the TSP, and the policies and objectives that relate to transportation system management are identified below.

Goal 6 Transportation

Several policies and objectives under Goal 6 relate to transportation system management. (The complete text is contained in Chapter 2 of the TSP.)

Policy 6.6, Transit Street Classification Descriptions, specifies where transit-preferential treatments are appropriate:

- Along the length of Regional Transitways and Major Transit Priority Streets

- At key intersections along Transit Access Streets

Access management is identified as an appropriate system management tool for Regional Transitways and Major Transit Priority Streets where needed to reduce conflicts between transit vehicles and other vehicles.

Policy 6.10, Emergency Response Street Classification Descriptions, Objective A, states that preferential or priority treatments are appropriate on Major Emergency Response Streets.

The Street Design classification for Urban Throughways identifies access management as a key operating characteristic for the smooth flow of traffic. Other street design classifications also address medians and access management to support the desired function of Regional and Community Corridors and of Urban Roads.

Policy 6.13, Traffic Calming, describes how traffic calming devices should be used to manage traffic and protect neighborhood livability. The intent of the policy is to balance the need for traffic to reach destinations efficiently with the need to implement the 2040 Growth Concept and support residential neighborhoods.

Policy 6.15, Transportation System Management, states:

> Give preference to transportation improvements that use existing roadway capacity efficiently and improve the safety of the system.

Objective B addresses system management most directly:

> Employ transportation system management measures including coordinating and synchronizing signals, to improve traffic and transit movements and safety for all modes of travel.

Policy 6.16, Access Management, defines how the City uses access management strategies. Access management is typically used on state-owned facilities to support the flow of traffic. It must be applied carefully to ensure that other transportation and land use objectives are not unfairly compromised. For example, not allowing curb cuts along a street may have a positive effect on traffic flow. If curb cuts are allowed on adjacent residential streets, however, traffic could choose to use those streets, with negative impacts on the neighborhood.

Policy 6.31, Truck Movement, Objective A, identifies street design and operating characteristic as ways to discourage truck through-traffic from using local residential streets.

DISTRICT TSM-RELATED POLICIES AND OBJECTIVES

District-specific objectives addressing transportation system management are contained in Policy 6.34 through Policy 6.40 for the seven transportation districts: North, Northeast, Far Northeast, Southeast, Far Southeast, Northwest, and Southwest. Policies and objectives related to TSM in the Central City are discussed in a separate section. Selected objectives are noted below; Chapter 2 provides the complete text of district policies and objectives.

- North – Improve truck and freight movement in North Portland through changes to the street system, street classifications, and signing to enhance the economic vitality of the area and minimize impacts on residential, commercial and recreational areas. (Policy 6.34, Objective A)

- Northeast – Encourage automobile and truck through-traffic to use major arterials at the edges of the district to reduce peak period traffic impacts and to preserve neighborhood livability. (Policy 6.35, Objective A)

- Far Northeast – Enhance the arterial street system by improving connections between Neighborhood Collectors and District Collectors and eliminating bottlenecks, such as rail crossings and viaducts, that contribute to intrusions into residential neighborhoods by commercial, industrial, and non-local traffic. (Policy 6.36, Objective A)

- Southeast – Direct interdistrict traffic to Regional Trafficways on the edges of the district, and manage traffic on Major City Traffic Streets and other arterials primarily through transportation system management measures. (Policy 6.37, Objective A)

- Far Southeast – Improve arterials through better signalization and intersection design to serve adjacent land uses and to provide for access to adjacent neighborhoods, while minimizing non-local traffic on local streets. (Policy 6.38, Objective B)

- Northwest – Limit transportation projects on West Burnside to those that reduce vehicle miles traveled, give preference to transit, improve pedestrian and bicycle access, or improve safety, but do not increase automobile capacity. (Policy 6.39, Objective H)

- Southwest – Improve the primary transportation function of SW Broadway Drive, SW Patton Road, SW Vista, SW Humphrey, and SW Dosch Road as Neighborhood Collectors by supporting pedestrian, bicycle, and transit use; calming traffic; and discouraging heavy volumes of non-local commuter traffic. (Policy 6.40, Objective B)

Goal 11B Public Rights-of-Way
The policies and objectives of Goal address the efficiency and safety of the transportation system.

Policy 11.8, Project Selection, identifies the correction of deficiencies and hazards as one criterion in project selection (Objective B).

Policy 11.12, Performance Measures, identifies safety and efficiency as two performance indicators with 5-year benchmarks. Benchmarks are used to evaluate the success of the TSP in achieving its goals.

Central City Transportation Management Plan
The CCTMP contains a number of policies that address transportation system management. TSM is particularly important within highly concentrated activity areas where there is very limited ability to expand system capacity. The following policies under Policy 2, Circulation and Access, address many aspects of system management:

- Policy 2.2, Modal Choice
- Policy 2.3, Priority for Transit
- Policy 2.4, Congestion Management
- Policy 2.6, Access Management to Increase Safety and Efficiency
- Policy 2.9, Central City Edges

Chapter 2 contains the complete text of these policies.

Other TSM-Related Policies and Objectives
In addition to the Transportation Element, the following Comprehensive Plan policies and objectives address transportation system management.

GOAL 5, ECONOMIC DEVELOPMENT
Policy 5.4, Transportation System, Objectives A, B, and C, support making transportation improvements that facilitate an efficient movement of goods and services in and out of Portland's major industrial and commercial areas.

GOAL 7, ENERGY
Policy 7.6, Energy Efficient Transportation, Objective C, states:

> Support efforts to ensure the energy efficiency of the transit system, including good street maintenance and transportation system management.

Existing Conditions

The Office of Transportation uses a variety of strategies or combinations of strategies to optimize performance of the City's transportation facilities, improve transportation safety, and improve air quality. These programs are divided into four main categories:

- Facility Design and Modifications
- Access Management
- Intelligent Transportation System
- Safety Measures and Traffic Calming

Facility Design and Modifications

The City modifies existing roadways in many ways to address roadway safety and operations. Intersection modifications such as channelization, traffic control devices, prohibitions on turns, bus pullouts, traffic signal timing and phasing are used to improve the operational efficiency of an intersection without costly reconstruction of the entire roadway.

Channelization is used to ensure gradual and smooth transitions when traffic moves from one lane to another or onto a bypass or detour, or when land width is reduced. Channelization devices include, but are not limited to, striping, cones, vertical panels, drums, barricades, and barriers. Channelization is frequently used in construction zones to temporarily direct traffic into new pathways.

Larger street modifications can improve the operational efficiency of existing facilities without expensive reconstruction to add lanes. These can include traffic circulation changes such as creating one-way streets. Other modifications include removing on-street parking, either completely or only at peak times in the peak direction of traffic.

The City is working with Tri-Met to create 'Streamline' bus corridors along streets with high ridership. The number 4 bus line travels between St. Johns and Gresham over Fessenden,

Albina, through downtown, and along Division. The number 4 bus Streamline project includes changes to signals, stop consolidations, and lanes with 'no turn except bus' treatments at 10 locations. Other routes in the Streamline project include bus lines number 12 and 72. Other spot changes along bus lines that experience delays will include 'bus only' lanes at locations with multiple bus lines.

The City traffic control center can make traffic circulation and signal timing changes to optimize the efficiency of City streets, especially during special events and at construction and maintenance zones. This strategy helps quickly move traffic in and out of the Rose Garden before and after Blazers basketball games.

Access Management

Access management provides efficient and safe movement of traffic while also providing adequate accessibility to adjacent land uses. Both the City and state recognize the importance of controlling access to properties adjacent to highways and major arterials to ensure the facilities operate safely, efficiently, and at reasonable levels of service. The City implements access management strategies on a case-by-case basis as land use applications come in. Exceptions are: 1) Airport Way, which has an access management plan, and 2) a portion of NE Killingsworth Street, which has an access management plan, which was adopted in 2004. The actions and objectives set forth in the latter access management plan are specifically incorporated into this TSP. ODOT administers access management on state facilities, based on the state's access management standards, which are part of the 1999 Oregon Highway Plan.

The City's approach to access management considers more than the need to maintain traffic flow and safe turn movements in and out of driveways along arterials. If, for example, locating driveways off side streets would lead to traffic infiltration on local residential streets, the needs of neighborhood livability may be more important than traffic flow on the arterials.

Various chapters of Title 33, Planning and Zoning, include access management regulations intended to reduce conflicts with transit movements or support pedestrian-oriented development. Plan district provisions regulate areas of the City subject to access management, including the Central City, Gateway regional center, small areas along SE Powell Boulevard, and the Hollywood town center.

Title 17 regulates the location, number, and size of driveways. Driveways may be restricted where necessary to "insure the safe and orderly flow of pedestrian and vehicular traffic." Driveways may be required to be reconstructed or removed "for the protection or convenience of pedestrians or vehicles using the street." Access management tools could also be used to reduce conflicts with bicyclists, particularly where the City has installed bike lanes.

Intelligent Transportation System

In 1994, ODOT completed the Region-wide Advanced Traffic Management System Plan, which provides the framework for regional development of intelligent transportation system (ITS) operational strategies. Based on this regional framework and policies, PDOT developed the Intelligent Transportation System (ITS) Implementation Plan in June 1997.

This plan provides guidance on the use of modern technology to optimize performance of multimodal transportation facilities within the City. As a TSM tool, the ITS Implementation Plan allows the City to apply and integrate advanced technologies in innovative ways to manage arterial operations and traffic control systems, resulting in improved operation of arterial and other surface streets. The City's ITS plan is built on the following vision statement:

- To maximize transportation productivity, mobility, efficiency, and safety
- To provide faster and better sharing of information between agencies and to the public
- To work as an integral member of a regional team using cost-effective ITS technologies and systems to promote efficient use of all mode of transportation

ITS strategies place more emphasis on technology than on major capital investments to provide the following potential benefits:

- Systematic monitoring and information sharing
- Improved management of traffic flows, congestion, and incidents
- Technologies and tools that allow interagency coordination to better manage and control roadway networks in real time or near-real time as a function of actual operating conditions

The City's use of ITS for traffic management includes:

- Traffic monitoring
- Traffic control
- Traveler information
- Advanced Traffic Management System
- Ramp metering
- Bus priority measures

According to a 1995 report by Kittelson & Associates and DKS Associates, the 82nd Avenue Traffic Signal Coordination Improvements project (6.4 miles between NE Webster and SE Flavel) substantially smoothed traffic flow on 82nd and resulted in the following annual savings to weekday motorists:

- *Travel time saved: 182,221 vehicle hours*
- *Reduced number of stops: 25,501,500*
- *Fuel savings: 135,937 gallons*
- *Reduced carbon monoxide emissions: 173,650 pounds.*

Based on the project cost of $50,000, a benefits-cost ratio of 4:1 was realized from fuel savings over just one year.

Traffic Monitoring

Traffic monitoring provides real-time monitoring of the City's transportation network. The information is integrated into traffic control scenarios, traveler information, and emergency response. Closed circuit television cameras (CCTV) and vehicle detection systems are used to identify congested operating conditions and incidents as quickly as possible. This real-time information allows the City to make quick operational changes or traveler notification, including signal timing changes, incident clearance needs, and media traffic reports. This strategy also gathers and maintains traffic data that can be used for transportation system management plans or future modeling for transportation projects. As a result of ITS plan, the City currently deploys many detector loops and about 60 video cameras.

Traffic Control

Traffic control devices help ensure road safety by providing for the orderly and predictable movement of all traffic (both motorized and non-motorized) throughout the City's transportation system. As a TSM tool, properly designed and maintained advanced traffic control devices can provide optimum benefits for the movement of people, goods, and vehicles. As of 2001, the City maintains a series 2000 central traffic signal computer and a communication system that provide central control to 450 of the City's 950 traffic signals.

Traveler Information

Advanced Traveler Information Systems (ATIS) is an important element of the City's ITS plan. The City's Traffic Operation Center collects real-time information about the transportation network and distributes it to travelers and other agencies at work, at home, on web sites, and through the media. This information helps travelers make informed decisions regarding traffic conditions, transit schedules, routing information, and mode choices before starting their trips. More efficient trip-planning decisions help the transportation network operate more efficiently.

Advanced Traffic Management System

The Advanced Traffic Management System (ATMS) is another primary component of the City's ITS plan. Unlike regular traffic management systems of the early 1990s, ATMS works in real time, responds to changes in traffic flow, works with surveillance and detection systems, and integrates multiple functions, including transportation information, demand management, freeway ramp metering, and arterial signal control. The functions of ATMS and ATIS (discussed above) are interrelated. Both use real-time information to manage congestion, and both can collect and distribute information to travelers to help them make efficient trip-planning decisions.

ATMS requires collaborative actions among the City and other regional agencies, and requires rapid-response incident-management strategies. Based on ATMS, the City monitors traffic with a limited number of closed circuit TV cameras and several detection stations, and monitors and controls 450 of 950 signalized intersections from the Series 2000 central computer system in the City's Traffic Operation Center. This coordinated set of strategies combines all of the ITS strategies into a seamless system that can make instantaneous changes to respond to traffic conditions.

Ramp Metering

Ramp metering is used primarily to control access onto urban freeways. The green intervals are typically short, permitting only one vehicle at a time to enter. This improves operating efficiency on the freeway and minimizes the occurrence and impact of congestion.

Because ramp meters are on state freeways, they are managed by the state. However, the City's and state's traffic operation centers are able to communicate with each other about the impact of metering on the City's arterials.

Although the City supports its use where necessary, ramp metering must be balanced with the operational needs of City streets that connect to the ramps. If ramp metering forces traffic to back up onto City streets, the resulting congestion can have negative land use and livability impacts on adjacent areas.

Bus Priority Lanes

Bus priority lanes or exclusive bus lanes are commonly used to improve transit operating efficiency and on-time performance in areas with high congestion or side frictions (delays caused by vehicles interfering with bus movements). This strategy focuses on achieving maximum efficiency of persons (rather than vehicles) moved. When properly implemented, a bus priority lane can result in a 5 to 10 percent reduction in peak-hour travel time.

A secondary benefit is that this strategy increases transit visibility and recognition to motorists queuing in general-purpose lanes.

Safety Measures and Traffic Calming

Four types of measures are used to improve the safety of City streets for all modes and calm traffic:

- Ongoing monitoring of traffic conditions and location-specific monitoring based on community reports are used to design and implement appropriate safety measures.

- Education measures alert people to ways they can help ease safety problems such as speeding. Programs such as Neighborhood Speed Watch and the 'Slow Down' banners can target specific locations where problems occur.

- Enforcement is a TSM tool used by the Police Bureau. It includes traditional ticket writing and the high-tech SMART wagon (an unstaffed trailer that uses radar to monitor speeds and a reader board to show drivers how fast they are going).

- Engineering (when used to describe TSM measures) means using a variety of traffic calming devices to reduce the speed and/or volume of traffic. Along with enforcement and education efforts, traffic calming can substantially mitigate for the traffic volumes that are typical in a dense, urban environment. Because traffic calming measures force motor vehicles to slow down, they benefit pedestrians and bicyclists as well. Traffic calming techniques can also be used to protect neighborhood streets from cut-through traffic seeking to avoid delays caused by traffic incidents or congestion during peak hours.

  Traffic calming devices must be selected and installed based on the specific problem being addressed. Some devices, such as speed bumps, have an impact on emergency vehicle response time and therefore are not used on Major Emergency Response Streets. Other traffic calming devices include traffic circles, traffic barriers such as diverters, special entrance treatments at key entryways into a neighborhood, pedestrian improvements such as curb extensions and medians, and bicycle lanes to reduce roadway width.

Traffic circle at NE 37th and Wisteria

As part of PDOT's reorganization in 1999, the Traffic Calming Program was consolidated with the operations section. Various program components (analysis, project management, engineering) were divided among task-specific groups. Recent traffic calming projects include NE Albina/Ainsworth, SW Corbett, SE Flavel, and school safety projects at Abernethy, Brooklyn/WinterHaven and Chief Joseph elementary schools.

PDOT, in partnership with the Traffic Calming Plan Citizen Advisory Committee (TCP-CAC), is engaged in the development of a Traffic Calming Master Plan (TCMP). This plan will define the role traffic calming has played in past to improve the livability of our community, describe the current state of traffic calming, and direct the future of traffic calming in Portland. The master plan will serve as an internal planning and design tool for PDOT in the provision of future traffic calming services. It will also serve as a reference guide and self-evaluation tool for residents seeking to address undesirable traffic conditions in their neighborhoods.

Existing Deficiencies

Issues from District Needs Assessment

In fall 1998, PDOT held TSP workshops in each of the Transportation Districts to gather information about transportation issues and community needs. Participants were asked to identify needed transportation improvements in their neighborhood and indicate their top three priority issues, or 'transportation values.'

Three of the top seven values identified in the workshops relate directly to transportation system management: manage congestion, provide connectivity, and safety and livability on local streets. Managing congestion was especially important in the Northwest, Northeast, Far Northeast, and Far Southeast Districts. Enhancing safety and livability on local streets (discussed primarily in regard to traffic speeds and the interaction between pedestrians and automobile traffic) was identified as a top priority in the Northwest, North, Northeast, and Southwest Districts.

Traffic Calming Needs

Beginning in the early 1990's, PDOT began compiling ranked lists – Streamline Speed Bump list, Local Service Complex list, and Neighborhood Collector list. Together, these lists identified more than 300 streets meeting minimum qualification criteria for traffic calming measures. In 1999, due to budget shortfalls, PDOT suspended additions to the list of projects and is no longer evaluating streets for potential traffic calming services. Currently, neighborhoods can receive traffic calming services through the Residential Speed Bump Purchase Program that allows residents to self-fund speed bump projects where their street meets minimum qualification criteria. Tables 5.13 and 5.14 list the high-ranking streamline speed bump and local service complex projects, respectively.

Table 5.13
High-Ranking Streamline Speed Bump Projects

Rank	Street	Segment	Posted Speed (MPH)	85% Speed (MPH)	Volume (vehicles per day)
1	NW Westover Rd	25th to Cornell	25	38	2366
2	SE 41st Ave	Holgate to Steele	25	37	2125
3	N Wall Ave	Lombard to Willamette	25	36	1295
4	N Alaska Ave	Foss to Chautauqua	25	36	1576
5	SW Barnes Rd	Burnside to Skyline	25	36	2289
6	N Woolsey Ave	Lombard to Willamette	25	35	2228
7	NE 114th Ave	Halsey to Glisan	25	36	1316
8	SE 130th Ave	Powell to Holgate	25	36	1845
9	SE 135th Ave	Stark to Division	25	35	2146
10	SE Lincoln St	39th to 50th	25	35	1878

Table 5.14
High-Ranking Local Service Complex Projects

Rank	Street	Segment	Posted Speed (MPH)	85% Speed (MPH)	Volume (vehicles per day)
1	NE Shaver St	122nd to 141st	25	40	2615
2	N Schmeer Rd	Interstate to Whitaker	25	42	2774
3	NE Knott St	15th to 33rd	30	40	5581
4	N Denver Ave	Lombard to Interstate	30	38	8851
5	NW Westover Rd	25th to Cornell	25	38	2366
6	SE Duke St	82nd to 92nd	25	36	3743
7	NE 72nd Ave	Killingsworth to Prescott	25	36	3782
8	SE Hawthorne Bl	50th to 60th	25	35	4791
9	N Mississippi Ave	Skidmore to Interstate	25	36	3411
10	SE 135th Ave	Stark to Division	25	35	2146

Note: Streets that are on both lists means that although the street would benefit from only speed bumps, the street has also been identified as one that would realize a greater benefit from a more comprehensive traffic calming treatment, i.e., Complex project. Not all streets on the Complex list qualify for speed bumps, for example, high traffic volumes and roadway characteristics.

Signal Replacement

The replacement value of traffic signal hardware and controllers and other equipment is approximately $98 million. The existing replacement rate for intersection hardware is not sufficient to adequately meet the need for replacements. If hardware is replaced at the current rate of 10 signals per year, 73 percent of intersection hardware will be in poor condition in the year 2020. Using the current replacement rate of 20 signal controllers per year, 70 percent of the controllers will be in poor condition by the year 2010. These numbers

do not take into consideration new signalized locations that may be added with the City due to future development, increased congestion and accidents.

Implementation Measures

Existing Regulations

Access Management
The Central City plan district regulations include access management on many streets to "enhance the street system's overall efficiency and safety for motor vehicles, transit, bicycles, and pedestrians." Access is prohibited (not allowed under any circumstances) in some cases; not allowed along the street in other cases; and not allowed within 75 feet of the street in other cases. Martin Luther King, Jr. Boulevard/Grand Avenue (99E) is a state facility where state access management measures also apply. Maps 510-9 of the Central City plan district regulations (Title 33, Planning and Zoning, Chapter 33.510) identify the access-restricted streets.

The Gateway plan district (Title 33, Chapter 33.526) states that motor vehicle access to any parking area or structure or loading area is not allowed from a light rail alignment unless the site does not abut another street.

The Hollywood plan district (Title 33, Chapter 33.536) restricts motor vehicle access along "enhanced pedestrian streets" unless the site has no other street frontage. The affected streets are NE Sandy Boulevard between NE 37th and NE 47th, and NE 42nd Avenue between NE Tillamook and the transit center north of the Banfield Freeway. NE Sandy is a state facility subject to state access management requirements. The purpose of these restrictions is to enhance and ensure the continuity of the pedestrian environment.

The Powell Boulevard plan district (Title 33, Chapter 33.565) encourages the consolidation of curb cuts where possible. Traffic access points from the frontage roads immediately south of Powell Boulevard are given preference over new access points directly onto Powell Boulevard. Powell Boulevard is a state facility subject to state access management requirements.

The Rocky Butte plan district (Title 33, Chapter 33.570) limits access to the "ring road" portion of Rocky Butte. For each 1,000 feet of property frontage abutting the ring road portion, no more than one intersection with a public or private street is allowed.

The NE Airport Way Access Management Policy applies to development along NE Airport Way. The intent of the policy is to promote traffic safety and flow, minimize new railroad and slough crossings, and provide a visually continuous median. City Council adopted this policy by Resolution No. 34846 in 1991.

Title 17, Public Improvements, regulates the number, location, and width of driveways. The City Engineer has authority to refer any driveway permit application to the City Traffic Engineer for review of the location and width. Table 5.14 identifies the minimum and maximum driveway widths allowed. No portions of a driveway, excluding ramps, can be within 25 feet from the corner of the lot where two streets intersect.

Table 5.15
Driveway Widths

Private Property Frontage[1]	Minimum Width	Maximum Width
Residential Driveways[2]		
50 feet or less	9 feet	20 feet
51 to 75 feet	9 feet	25 feet
76 to 100 feet	9 feet	30 feet
Commercial Driveways[3]		
50 feet or less	10 feet	20 feet
51 to 100 feet	20 feet	30 feet

1 Each 100 feet of frontage, or fraction thereof, under single ownership is considered a separate frontage.
2 If more than one driveway is desired, with frontage up to 100 feet the maximum width of driveways can be 15 feet ,with not more than two driveways, as long as five feet of straight curb separates the driveways.
3 If more than one driveway is desire, with frontage up to 100 feet the maximum width of driveways can be 20 feet, with not more than two driveways, as long as five feet of straight curb separates the driveways.

The City Traffic Engineer recommends conditions and limitations regarding the location and operation of driveways as necessary to ensure the safe and orderly flow of pedestrian and vehicular traffic. Driveways are regulated by use: residential (one to two units) and commercial (all other uses).

Proposed Regulation Changes

Amendments to Title 17 include reducing driveway widths in residential zones from 10 feet to 9 feet to match Title 33 requirements, and providing for street and pedestrian/bicycle connections through development sites consistent with connectivity requirements in land divisions.

Projects

The following TSP projects implement TSM measures (not listed in order of importance or funding priority):

- Barbur Boulevard ITS corridor (Project No.90014)
- Martin Luther King, Jr. Boulevard ITS corridor (Project No. 40058)
- Sandy Boulevard ITS corridor (Project No. 40069)
- 82nd Avenue ITS corridor (Project No. 40015)
- Macadam Avenue ITS corridor (Project No. 90046)
- Airport Way ITS corridor (Project No. 50016)
- Beaverton-Hillsdale Highway ITS corridor (Project No. 90019)

- Columbia Boulevard ITS between Burgard and I-205 (Project No. 30008)
- Lombard ITS corridor (Project No. 30035)
- 122nd ITS corridor(Project No. 50005)
- Cornfoot Road/Alderwood intersection improvements (Project No. 40035)
- Transit signal priority, citywide (Project No. 10003)
- SE 26th/Holgate, intersection improvements and traffic calming (Project No. 70004)
- 60th Avenue corridor safety (Project No. 70006)
- Central City TSM improvements (Project No. 20016)
- Clay/Martin Luther King, Jr. Boulevard intersection improvements (Project No. 20018)
- Everett Street between Park and 16th corridor safety (Project No. 60008)

Many other TSP projects include TSM elements to improve traffic flow and safety. Chapter 3 contains the complete list of TSM projects and project descriptions.

Other TSM Projects

Many TSM projects are too small to qualify for the TSP project list, but are important to the safe and efficient operation of Portland's streets. Very small-scale improvements, such as adding a stop sign or removing vegetation that blocks visibility, are not considered for capital funding. Instead, these small projects are addressed relatively quickly through ongoing Bureau of Maintenance (BOM) activities. Other projects that are neither addressed through BOM operations nor on the TSP list may be financed through the capital improvements plan (CIP). A sample of recent TSM projects that fall into this CIP category includes:

- SW Corbett traffic calming, Phase III
- Signal communication system (ongoing program)
- ITS signal system upgrade (ATMS)

PDOT has widely used traffic calming measures to slow traffic in Portland neighborhoods. Most recently, funds have been allocated to an Elementary School Safety Program to improve safety for children in school zones at public and private elementary schools.

Strategies

Chapter 4, Refinement Plans and Studies, of the TSP identifies the evaluation of ODOT district highways as a future study. The purpose of the study would be to devise a mechanism for transitioning district highways within the City limits to Portland's jurisdiction and management. For the most part, the district highways do not serve regional through traffic. The City's interest in assuming jurisdiction is based on land use (implementing 2040 main street development); development review (giving one agency permit authority for buildings and access); street design (incorporating multimodal features and calming traffic); and operations (implementing signalization and parking controls). There are significant costs associated with the transfer from ODOT to City authority including maintenance costs and bringing the highways up to City standards.

Conclusion

Managing the transportation system will increasingly be one of the most important tools to address population and employment growth in Portland. Funding limitations and community concerns have led to using transportation system management strategies to maximize efficiency, safety, and extend the useful life of the existing transportation network in a cost-efficient manner. New technologies allow the City to improve both traffic flow and transit operations.

Traffic calming, along with enforcement and education efforts, can help to ensure that neighborhoods are pleasant for residents, pedestrians, and bicyclists. However, recent budget reductions have significantly decreased the number of traffic calming projects being installed. The City is reviewing new local funding sources that will enable the City to reduce the backlog of traffic calming projects requested by neighborhoods and individuals.