Chapter 3: Transportation System Management & Operations and Travel Demand Management

As roadways in Washington County grow more congested, it becomes increasingly important to focus on cost-effective strategies that maximize the efficiency of the existing system. Transportation System Management and Operations (TSMO) strategies seek to improve the performance of existing transportation infrastructure without taking additional land for new roadways or additional lanes. TSMO strategies emphasize multimodal traffic management, traveler information, incident management and transportation demand management (TDM) strategies that promote travel options and reduce drive-alone trips.

3.1 OVERVIEW

Transportation System Management and Operations (TSMO) strategies are consistent with the goals and desired outcomes in the 2035 Regional Transportation Plan (RTP), including Goal 3: Expand Transportation Choices; and Goal 4: Emphasize Effective and Efficient Management of the Transportation System. Metro adopted the Portland Regional TSMO Refinement Plan in 2010, which identifies the following four project categories:

- Section 3.2 below describes Multimodal Traffic Management – provides arterial and freeway multimodal traffic management and operations functions including advanced signal timing, access management, arterial performance monitoring, transit priority treatments, data collection, and detection and countdown timers for pedestrians and bicyclists.

- Section 3.3 below describes Traveler Information – provides current and forecasted travel conditions information via a variety of sources to help people make better informed travel decisions, including travel mode, route, and time of day.

- Section 3.4 below describes Incident Management – provides resources and builds partnerships to foster a coordinated, timely and efficient response to traffic incidents that block travel lanes, slow or stop travel, and lead to unreliable travel times. The strategies include improved surveillance, expanded service, expanded training, and incident response teams.

- Section 3.5 below describes Transportation Demand Management – Impacts traffic congestion by reducing the demand for roadway capacity using strategies such as telecommuting, flexible work hours and ride sharing, particularly during peak hours.

The following sections describe how the TSMO strategies are currently operating in Washington County.

---

3.2 **Multimodal Traffic Management**

There are four multimodal traffic management strategies that currently operate in Washington County:

1. **Operate and maintain a regional communications network** – A communications network connects traffic signals with each other and to a central server, so that operators can efficiently manage the transportation system. Currently only a small portion of Washington County traffic signals are connected to the regional TransSuite server, using either fiber optic or interconnect cables. The ultimate goal is to install communications that connect all traffic signals in Washington County to the regional server. The Washington County ITS Plan\(^2\) includes detailed information regarding the communications infrastructure in Washington County.

The Oregon Department of Transportation (ODOT) operates a staffed regional Traffic Management and Operations Center (TMOC). The center operates around the clock and performs the following functions for the state highway system in Washington County:

- **Traffic Management**: Operation of traffic control devices (e.g. signal timing, signal interconnects and variable speed limit signs)
- **Incident Management**: Detection/identification, response (e.g. dispatch), and management of incidents
- **Maintenance Support**: Dispatch and communications for ODOT maintenance crews
- **Information Services**: Dissemination of traveler information to the public via variable message signs and online computer services such as “TripCheck”.

The TMOC has access to video images from other agencies’ closed-circuit television cameras as well as their own cameras in Washington County.

The Washington County Traffic Operation Center (TOC) currently consists of two workstations that have access to the county’s traffic signal systems. These workstations are not staffed continuously in the way that the regional TMOC is, rather remote connectivity allows staff to remotely control the traffic management systems on an as needed basis. Since 2005, Washington County has been installing video detection for all new traffic signals and existing traffic signal retrofits. However, many of the county’s traffic signals still use inductive loops, in addition to detecting motor vehicles bicycle detection is available at some locations in the county.

The majority of the traffic signals in Washington County have emergency vehicle preemption on all intersection approaches. Most fire vehicles and some police vehicles have the capability to preempt these traffic signals. The preemption allows the emergency vehicles to turn the signal green to safely navigate the intersection when responding to an emergency. Furthermore the preemption system allows for a lower priority green time adjustment for non-emergency transit vehicles.

2. **Freeway management** – OR 217 and the portions of US 26 and I-5 within Washington County are operated by ODOT and are all equipped with technologies that improve the operational efficiency of the system. Those technologies include vehicle detection, video surveillance, and ramp meters. Variable

---

message signs currently operate on US 26 and I-5. On OR 217 a project to install variable message signs (and variable advisory speeds) is included in ODOT’s FY2010-2013 Statewide Transportation Improvement Program Amended.

3. **Coordinated signal timing** – Based on a long history of working together and sharing the same local traffic signal hardware and software, agencies in the Portland region have jointly selected and agreed to implement the TransSuite traffic signal system. The county’s long term signal coordination goal is to connect all signals to the regional TransSuite traffic signal system. The shared central signal system provides many benefits for the region such as:

- Reduced implementation and maintenance/operations costs since there is one region-wide software license and only two servers
- Shared control and monitoring of multiple agencies’ traffic signals for cross-jurisdictional coordination during normal operations, incidents, and special events
- Reduced maintenance/operations costs when a traffic signal timing issue can be handled in the office instead of in the field
- A large pool of trained staff on a common software system
- A common source for traffic data (volume, speed, and occupancy) from the region’s traffic detectors

Washington County, ODOT, and the Cities of Beaverton, Hillsboro, and Tigard still operate time-based coordination at many of the signalized intersections during the weekday and weekend peak periods. Such time-based systems use a combination of a.m., mid-day, p.m., and weekend peak coordinated timing plans. Washington County uses GPS to coordinate time clocks on a number of corridors that do not have communications interconnect between the traffic signals. Many of these traffic signals operate in the free mode because they are isolated and not conducive to coordination. Coordinated signal timings have been updated on several corridors within the past 10 years including: SW Murray Boulevard, SW Scholls Ferry Road, SW Farmington Road, NW Cornell Road, NW Bethany Boulevard, NW 185th Avenue, SW Cornelius Pass Road, NW Cornell Road, and SW Boones Ferry Road. Ideally these timing plans should be updated every few years to reflect changes in traffic demand.

4. **Adaptive signal timing** – Adaptive signal timing systems have been deployed on a few heavily congested corridors in Washington County. These systems adjust green time given to each movement based on real-time changing traffic conditions. Washington County has installed advanced systems on Cornell Road and Tualatin-Sherwood Road (Teton to I-5, with HWY 99W to Teton scheduled to be implemented). The City of Beaverton has installed a similar advanced system on Farmington Road/Beaverton-Hillsdale Highway. The City of Beaverton has a programmed project to expand their system to Canyon Road (OR 8).
3.3 TRAVELER INFORMATION

Region-wide traveler information is provided by the Oregon Department of Transportation (ODOT), and Washington County Consolidated Communications Agency (WCCCA). The Washington County website includes a site dedicated to road work traveler information (www.wc-roads.com). It provides information about road closures, traffic advisories, and construction and maintenance projects. The site also highlights road work activities on a weekly basis. Cities within the county also provide a variety of construction and maintenance traveler information on their websites.

The ODOT TripCheck system includes a website (www.tripcheck.com), mobile phone applications, Twitter feed, 511 phone system, and a data feed to the media and other interested parties. Washington County uses the TripCheck Local Entry tool to input information about events with major traffic impacts so that the information may be shared with the public and media through the TripCheck system. A comprehensive description of the TripCheck system is included in the Oregon Statewide ITS Architecture and Operational Concept Plan.
3.4 INCIDENT MANAGEMENT

The Oregon Department of Transportation (ODOT) operates an incident response and management system known as “COMET”. ODOT currently operates an incident response program to address traffic congestion and delays caused by incidents on freeways within the Portland metropolitan region. The incident response program has full-time employees who staff several incident response vehicles, which are equipped with flat tire repair gear, gasoline, jumper cables, water, and other essentials for rescuing disabled vehicles and getting them on the move again. Incident response vehicles are available for service 24 hours per day, seven days a week, and on the road 24 hours per day on weekdays and most of Saturdays and Sundays. Incident response vehicles currently patrol I-5, I-84, I-205 and I-405 freeways as well as OR 217 and US 26 (Sunset Highway) daily. The drivers are in constant communication with the ODOT Traffic Management and Operations Center (TMOC). If an incident occurs on an ODOT roadway, incident response vehicles are available to respond. The main priority for responders is to keep travel lanes clear by helping a vehicle off the road and assisting the motorist if possible. The responders assist motorists with flat tire repairs, extra gasoline, battery jumps, and so forth. If the responder’s equipment cannot help move the disabled vehicle off the travel lanes, then the responder will call a tow truck at the motorist’s expense.

The freeways in Washington County are equipped with traffic monitoring cameras; however, few arterials have traffic monitoring cameras in place. The County has traffic monitoring cameras along the eastern section of Tualatin-Sherwood Road. Plans for the installation of traffic monitoring cameras along the western section of Tualatin-Sherwood Road are being prepared. Traffic monitoring cameras are scheduled to be installed along Scholls Ferry Road by the end of 2012.

In addition, emergency responders are available to assist. The Washington County Consolidated Communications Agency (WCCCA) manages the 9-1-1 call center and provides information. The WCCCA is the 9-1-1 dispatch agency for all public safety agencies in Washington County3. The WCCCA acts as the central answering point for all of the public safety agencies. WCCCA has over 50 full-time dispatchers for the more than 500,000 Washington County residents it serves. WCCCA operates 24 hours a day, 365 days a year. They dispatch calls to 12 police agencies and 7 Fire / Emergency Medical Service agencies. The consolidated agency houses a computer-aided dispatch system that maps addresses and provides other information that enhances 911 services. The Oregon Interoperability Service message broker allows WCCCA’s dispatch system to communicate with other dispatch systems used by other 9-1-1 centers in the region and the ODOT TMOC.

---

3 Except the Forest Grove Police Department
3.5 TRANSPORTATION DEMAND MANAGEMENT

Metro oversees the Regional Travel Options (RTO) program. The RTO program implements Transportation Demand Management (TDM) strategies across the Portland region to increase travel options, reduce pollution, and improve mobility. The following region-wide TDM strategies are supported by the RTO program and extend to Washington County:

- **Marketing and Providing Resources** – The RTO Program funds collaborative and individualized marketing, as well as updating resources such as the “Bike There!” and “Walk There!” maps. The “Drive Less. Save More” campaign is one example of collaborative marketing, which aims to increase awareness and use of travel options that reduce drive alone trips.

- **Employer Services** – The RTO programs supports outreach efforts to employers to decrease drive alone trips and vehicle trips during peak periods. Figure 3-1 shows employer mode-split performance in 2007-2008, with the majority of participating employers in Washington County at a rate of over 83% employee drive-alone trips.

- **Rideshare Services** – The RTO program supports rideshare services by funding marketing, outreach, and incentives that encourage ridesharing (carpool or vanpool). The area north of Beaverton, on either side of US 26, has the highest number of registered CarpoolMatchNW.org commuters (over 200) for Washington County zip code areas, as of 2007-2008⁴.

- **Measuring program effectiveness** – The RTO program measures the effectiveness of the services provided.

- **Regional TSMO program** – Support program oversight, and administer RTO and TSMO grant programs.

Founded in 1996, the Westside Transportation Alliance (WTA) is a non-profit business association, and the only transportation management association on the west side of Portland. The WTA stated mission is as follows:

“To provide programs and services to Westside employers that reduce single-occupant vehicle trips, reduce greenhouse gas emissions, foster economic vitality and improve health.”

The WTA provides the following services to employers:

- **Employee Commute Option (ECO)** ⁵ – The WTA Creates and administers a survey and files the results as part of a mandated ECO report to the Department of Environmental Quality (DEQ). Table 3-1 compares commuter trip mode share changes between 2009 and 2011. This data was compiled for 40 employers and over 19,000 employees in the WTA area who participated in the ECO survey or TriMet Employer Pass Program survey. As indicated by this data, the percentage of single-occupant (i.e., drive alone) trips decreased by five percent while bike, transit, compressed work week, and telecommuting all increased by one to three percent. Over the same period, carpooling use decrease by three percent, probably as a result of commuters switching to other modes.

---

⁴ Portland Regional TSMO Refinement Plan 2010-2020. Metro. June 2010, Figure 8
⁵ The comply with the federal Clean Air Act, the Department of Environmental Quality’s Employee Commute Options (ECO) Rule mandates that employers with more than 100 employees at one site must provide commute options designed to reduce the number of cars driven to work in the Portland and surrounding areas.
• **Auto Trip Reduction Plan** – Helps create and implement DEQ compliance plan.

• **Transportation Coordinator Support** – Provides training, programs and incentives to transportation coordinators.

• **GIS Support** – Geo-codes mapping of employee home locations for carpool matching.

• **New Employee Transportation Options Packet** – Develops and distributes information on commute options.

<table>
<thead>
<tr>
<th>Table 3-1: Commute Trip Mode Share Change for WTA Worksites 2009-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mode</strong></td>
</tr>
<tr>
<td>Single-Occupant Vehicle</td>
</tr>
<tr>
<td>Transit</td>
</tr>
<tr>
<td>Bike</td>
</tr>
<tr>
<td>Carpool</td>
</tr>
<tr>
<td>Compressed Work Week</td>
</tr>
<tr>
<td>Telecommute</td>
</tr>
</tbody>
</table>

*Source: Metro Regional Travel Options 2012-2017 Strategic Plan, Nelson/Nygaard Consulting Associates, Appendix, March 2012, Fig. 21*

The WTA provides the following services to employees:

• Prepares personalized commute trip planning
• Publishes monthly commute newsletter
• Holds on-site transportation fairs
• Distributes transportation information (transit schedules, bike maps)
• Disseminates information concerning road closures and transit service disruptions
• Organizes the annual Carefree Commuter Challenge, which awarded prizes to individuals who reduced driving during the month of July6.

Much of what the WTA does involves marketing, the effects of which are often difficult to quantify. In terms of measurable results, a 2008-2009 program evaluation showed a reduction of 3.4 million in vehicle miles traveled through its programs. A more recent WTA accomplishment was the installation of 25 bike racks in front of participating businesses in the Tigard area. A post-installation survey indicated that 86 percent of the riders reported that the bike racks encouraged them to ride their bikes to downtown Tigard. Sixty-one percent of the participating businesses reported that the racks were used more than once and week and 54 percent of the businesses responded that the racks were good for business.

---

6 In 2010, 201 companies and 1,672 individuals participated in this challenge, resulting in an estimated 43 percent reduction in miles driven between pre and post-challenge surveys.
Figure 3-1: Regional TDM Employer Service and Drive-Alone Rates (2009)

Source: Metro