METRO

Appendix 4.4 2035 Regional Transportation Plan
Congestion Management Process Roadmap

FEDERAL FINDINGS AND FUTURE WORK PROGRAM ACTIVITES

1.0 INTRODUCTION

The communities of the Portland metropolitan region have embraced a collaborative approach to planning that has made our region one of the most livable regions in the country. In the last two decades of the 20th century, the region join together to address the challenges, like growing traffic congestion, brought on by rapid population growth. In the 21st century we are faced with a new set of challenges. In addition to continued, steady population growth, we also must address climate change, rising energy prices, aging infrastructure, and limited funding for transportation.

The Portland region's Congestion Management Process (CMP) is designed with these challenges in mind. It represents a new way of thinking about integrated transportation networks and land use to manage mobility of people and goods movement.

This report lays out the framework of our CMP and provides a road map for locating the elements of the CMP that have been woven into the 2035 Regional Transportation Plan and supporting documents.

1.1 CMP OVERVIEW

To integrate congestion management into the regional transportation planning process the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) required metropolitan planning organizations (MPO) to develop a congestion management system (CMS). The 2005 Safe, Accountable, Flexible, Efficient, Transportation Equity Act: a Legacy for Users (SAFETEA-LU), expanded the CMS requirements through the creation of the Congestion Management Process (CMP). In 23 CFR Part 450 Section 320 the Federal Highway Administration defines a CMP as "…a process that provides for safe and effective integrated management and operation of the multimodal transportation system, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities…through the use of travel demand reduction and operational management strategies."

The CMP "presents a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies to alleviate congestion and

enhance the mobility of persons and goods to levels that meet state and local needs."[1] At the very minimum the CMP must:

- Measure multi-modal transportation system performance
- Identify the causes of congestion
- Assess alternative actions
- Implement cost-effective actions
- Evaluate the effectiveness of implemented actions

As the federally designated MPO for the Portland region, Metro is required to maintain the region's CMP. Metro's CMP is an integral component of the 2035 Regional Transportation Plan (RTP), helping to inform the policy and investment decisions imbedded in the plan and implementation of the plan through local transportation system plans and other implementing regulations. Metro has expanded upon the minimum CMP requirements, listed above, to apply the framework identified in FHWA's *"Interim Guidebook on the Congestion Management Process in Metropolitan Transportation Planning."* The framework includes the following eight-step process:

- Develop congestion management objectives
- Identify area of application
- Define system/network of interest
- Develop performance measures
- Institute system performance monitoring plan
- Identify/evaluate strategies
- Implement selected strategies/manage system
- Monitor strategy effectiveness

Develop Congestion Management Objectives

The 2035 RTP adopts an outcomes-based approach to regional transportation planning that is performance-driven and includes policies, objectives and performance targets that direct future planning and investment decisions to consider economic, equity and environmental objectives. Section 2.3 of the 2035 RTP outlines this approach through a series of goals, objectives and performance targets that describe the overall vision of the plan. The ten goals and supporting

[1] http://plan4operations.dot.gov/congestion.htm

objectives provide an overarching guide for transportation planning, while the performance targets provide a method for tracking progress towards meeting the goals and objectives. Together the goals, objectives and performance targets serve as the framework for the region's CMP. While all facets of transportation planning are covered, the goals and objectives specific to the CMP can be seen in Table 1.

Table 1
2035 RTP CMP Goals and Objectives

Goal	Objectives
1. Foster Vibrant Communities and Efficient Urban Form	**1.1 Compact Urban Form and Design** - Use transportation investments to reinforce growth in and multi-modal access to 2040 Target Areas and ensure that development in 2040 Target Areas is consistent with and supports the transportation investments.
	1.2 Parking Management - Minimize the amount and promote the efficient use of land dedicated to vehicle parking.
2. Sustain Economic Competitiveness and Prosperity	**2.1 Reliable and Efficient Travel and Market Area Access** - Provide for reliable and efficient multi-modal regional, interstate and intrastate travel and market area access through a seamless and well-connected system of throughways, arterial streets, freight services, transit services and bicycle and pedestrian facilities.
	2.2 Regional Passenger Connectivity - Ensure reliable and efficient connections between passenger intermodal facilities and destinations in and beyond the region to improve non-auto access to and from the region and promote the region's function as a gateway for tourism.
	2.3 Metropolitan Mobility - Maintain sufficient total person-trip and freight capacity among the various modes operating in the Regional Mobility Corridors to allow reasonable and reliable travel times through those corridors.
	2.4 Freight Reliability - Maintain reasonable and reliable travel times and access through the region as well as between freight intermodal facilities and destinations within and beyond the region to promote the region's function as a gateway for commerce.
3. Expand Transportation Choices	**3.1 Travel Choices** - Achieve modal targets for increased walking, bicycling, use of transit and shared ride and reduced reliance on the automobile and drive alone trips.
	3.2 Vehicle Miles of Travel - Reduce vehicle miles traveled per capita.
4. Emphasize Effective and Efficient Management of the Transportation System	**4.1 Traffic Management** - Apply technology solutions to actively manage the transportation system.
	4.2 Traveler Information - Provide comprehensive real-time traveler information to people and businesses in the region.
	4.3 Incident Management - Improve traffic incident detection and clearance times on the region's transit, arterial and throughways networks.
	4.4 Demand Management - Implement services, incentives and supportive infrastructure to increase telecommuting, walking, biking, taking transit, and carpooling, and shift travel to off-peak periods.

	4.5 Value Pricing - Consider a wide range of value pricing strategies and techniques as a management tool, including but not limited to parking management to encourage walking, biking and transit ridership and selectively promote short-term and long-term strategies as appropriate.
5. Enhance Safety and Security	**5.1 Operational and Public Safety** - Reduce fatalities, serious injuries and crashes per capita for all modes of travel.

In order to track progress towards achieving the above congestion-related goals and objectives, the following performance targets will be used:

Congestion By 2035, reduce vehicle hours of delay (VHD) per person by 10 percent compared to 2005.

Freight reliability By 2035, reduce vehicle hours of delay per truck trip by 10 percent compared to 2005.

Active transportation By 2035, triple walking, biking and transit mode share compared to 2005.

Travel By 2035, reduce vehicle miles traveled per person by 10 percent compared to 2005.

Safety By 2035, reduce the number of pedestrian, bicyclist, and motor vehicle occupant fatalities plus serious injuries each by 50% compared to 2005.

Identify Area of Application

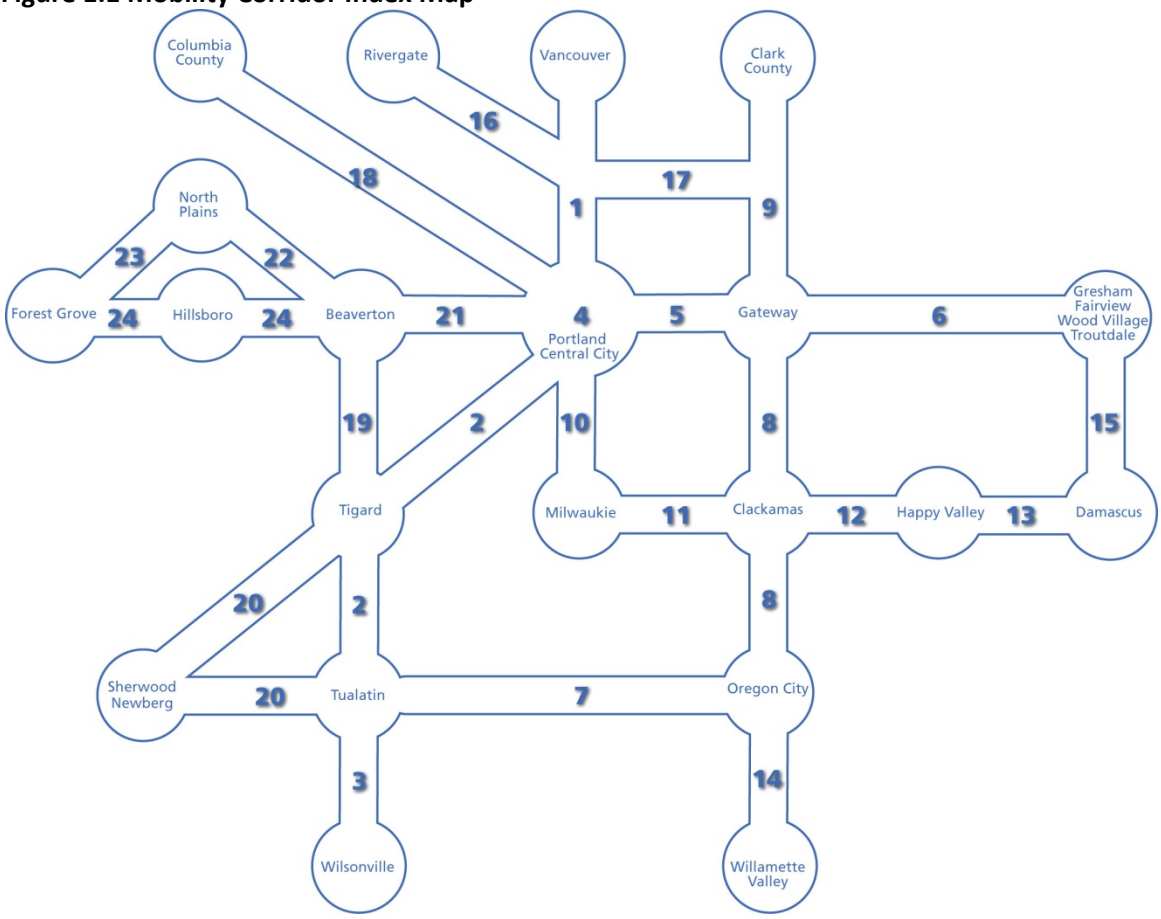
The Portland Metropolitan Area has several planning boundaries with different purposes. Metro's jurisdictional boundary encompasses the urban portions of Multnomah, Washington and Clackamas counties. Under Oregon law, each city or metropolitan area in the state has an urban growth boundary that separates urban land from rural land. Metro is responsible for managing the Portland metropolitan region's urban growth boundary. In addition there is the Urbanized Area Boundary (UAB) which delineates areas that are urban in nature and the Metropolitan Planning Area (MPA) Boundary which marks the geographic area to be covered by MPO transportation planning activities. The Portland region's CMP is applied to the transportation network lying within the MPA Boundary. See Figure 1.2 of the 2035 RTP for a map of the planning area.

Define System or Network of Interest

The mobility corridors concept has emerged as a method for framing the geographic scope of the CMP and planning for a truly integrated transportation system. Regional mobility corridors integrate arterial streets, throughways, high capacity transit, frequent bus routes,

freight/passenger rail, and bicycle parkways into regional subareas. These networks work together to provide for regional, statewide and interstate travel. The function of this network of integrated transportation corridors is metropolitan mobility – moving people and goods between different parts of the region and, in some corridors, connecting the region with the rest of the state and beyond. The regional mobility corridor concept calls for consideration of multiple facilities, modes and land uses when identifying needs and the most effective mix of land use and transportation solutions to improve mobility within a specific corridor. **Figure 1.1** is a conceptual representation of the 24 mobility corridors and the locations they connect.

Figure 1.1 Mobility Corridor Index Map



In April 2009, Metro published the Atlas of Mobility Corridors, the first of its kind created for this region. It was conceived as a way to visually present current land use and multi-modal transportation data for each of the region's 24 mobility corridors. It was designed primarily to help planners and decision-makers understand existing system conditions, identify needs and prioritize mobility investments. For each corridor, the atlas provides a general overview that includes location in the region, primary transportation facilities and land use patterns, and an assessment of gaps and deficiencies by travel mode. This information will be used to help identify the most cost-effective strategies and investment priorities for each corridor and serve

as a framework for monitoring how well different strategies are working in each corridor over time.

The Atlas of Mobility Corridors served as the foundation for the development of mobility corridor strategies for all 24 mobility corridors included in Chapter 4 of the RTP. Within each mobility corridor strategy the following elements are included to guide the understanding of the concept

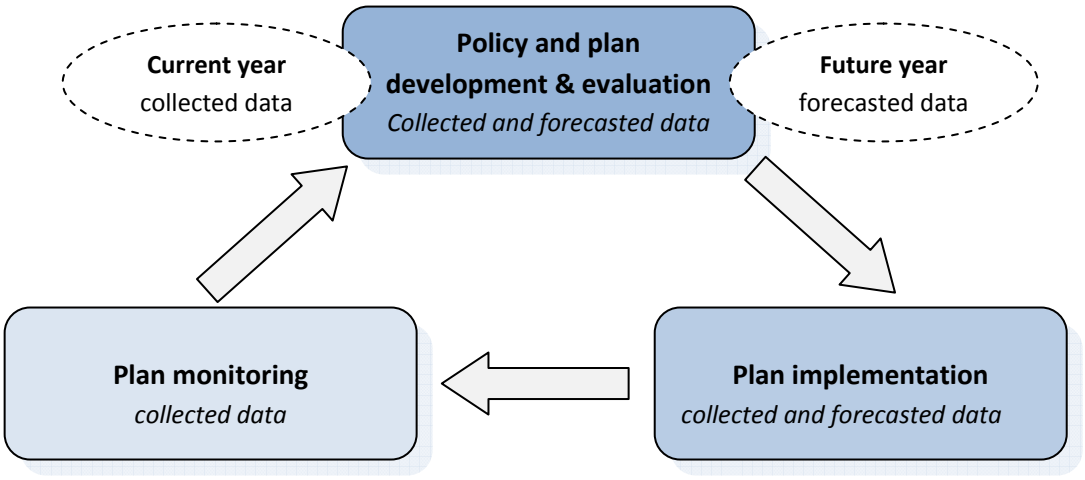
- Corridor function
- Corridor characteristics
- Regional transportation facilities
- Regional 2040 land uses
- Corridor needs
- 2035 RTP mobility corridor performance measures
- 2035 RTP investments
- RTP investment strategy

The mobility corridor strategies create the sub-areas to link regional investments to the outcomes-based policy framework of the RTP. They are intended as an early scoping tool to document land use and transportation needs, function and potential solutions for each mobility corridor.

Develop Performance Measures

The performance measurement system initiated with the 2035 RTP establishes an on-going evaluation and monitoring process, see **Figure 1.2**. The performance measures will serve as the dynamic link between RTP goals and plan implementation by formalizing the process of evaluation and monitoring to ensure the RTP advances toward achievement of the region's transportation, land use, economic, and environmental goals.

Figure 1.2 RTP Performance Measurement System



The following multimodal performance measures provide Metro the ability to measure transportation system performance within each of the 24 mobility corridors.

1. Vehicle miles traveled (total and per capita)
2. Average trip length by mobility corridor
3. Motor vehicle and transit travel time between key origin-destinations for mid-day and PM peak
4. Congestion - Location of throughways, arterials, and regional freight network facilities that exceed RTP motor vehicle-based level of service thresholds in mid-day and PM peak
5. Travel time reliability on throughways (buffer index – additional time added to ensure on time arrival 95% of the time)
6. Average incident duration on throughway system
7. Number and share of average daily shared ride, walking, bicycling and transit trips region wide, by mobility corridor and for the Portland central city and individual regional centers

Institute System Performance Monitoring Plan

The RTP system monitoring program will report out current conditions using observed data for each of the 24 mobility corridors. A system performance report will be prepared every two years in advance of the allocation process for regional flexible funds. The report will also inform the existing conditions element that is prepared in advance of future RTP updates to assess whether the region is moving in the right direction and identify possible policy or strategy adjustments that may be needed. Available congestion data includes:

- Cutline count information from the City of Portland, Multnomah County, Washington County, Clackamas County, and Oregon Department of Transportation (ODOT)
- Vehicle classification traffic count data from ODOT (from their highway performance monitoring system - HPMS - which includes several truck classifications)
- Automatic traffic recorder data from ODOT for 18 locations in the Portland Area, plus similar data from Washington DOT
- Volume and classification traffic counts from the Port of Portland's annual report
- Texas Transportation Institute's data for Portland - for their Urban Mobility Study - through an ODOT contact and directly from TTI
- TriMet Monthly Transit Performance Reports
- Washington State Monthly Speed Data
- ODOT Safety Data

Data Collection and Methodology

The following agencies will be the principal partners in collecting and evaluating CMP data. Other agencies will also be involved in the system, with their efforts coordinated through TransPort, the regional Intelligent Transportation Systems (ITS) committee.

- *ODOT* has installed a comprehensive monitoring system across the region. Its Traffic Management Operations Center (TMOC) collects ITS data using roadway sensors to conduct real-time management of the transportation system. The ongoing development of the system is overseen by TransPort, which monitors and updates the regional TSMO plan and ITS architecture.
- *Portland State University ITS Laboratory (PORTAL)* **–** collects and archives transportation data in the Portland-Vancouver Metropolitan area. Currently data available from PORTAL includes: travel speeds, weather, camera images, and incidents. In the future PORTAL will expand its capabilities to include data for freight, transit, arterials, bicycles/pedestrians and amount of congestion.
- *TriMet* provides Metro with boarding and headway data on the CMP high capacity transit network and other transit serving principal arterial routes. TriMet also reports traffic operations data from its GPS-equipped bus fleet.
- *Metro* further analyzes the highway and transit data provided by Portland State and TriMet and presents it in the biennial 2040 Performance Measures Report. Metro leads the region's demand management program, including the evaluation function. In this role, Metro evaluates commute options survey data and other data sources to estimate non-SOV

travel in the region. Metro's travel forecasting program serves as the region's clearinghouse for forecast data and other information collected from federal, state and academic sources. See Appendix A for a more detailed description of Metro's data collection efforts.

- *Southwest Washington MPO* maintains a CMP for the greater Vancouver area. Its efforts are coordinated with the Metro region, using the same technical coordination that is employed in sharing travel forecasting and demographic data.

Identify and Evaluate Strategies

The Atlas of Mobility Corridors identifies time horizon strategies for each of the 24 mobility corridors. The process of developing each corridor strategy included:

- Scoping analysis that identifies land use, local aspirations, pedestrian, bike, management and operations, freight, highway, road and transit needs and issues.
- Integrated statement of mobility function and defined at a corridor area level where a concept was not included in the RTP.
- Potential land use and transportation solutions identified.

The strategies identify system needs, functions, solutions to address identified needs and investment strategies to work towards over life of the RTP. Each mobility corridor strategy contains two investment tracks: mobility corridors and community building. The investment strategy is broken into three time horizons: near term (1-4 years), medium term (5-10 years), and long term (10-25 years). See section 4.2 of the RTP for a detailed overview of all 24 mobility corridor strategies.

Each of the 24 mobility corridor strategies has been evaluated using Metro's regional travel demand forecast model. Ongoing evaluation of the strategies will be conducted using biennial performance reports which will be based on observed data.

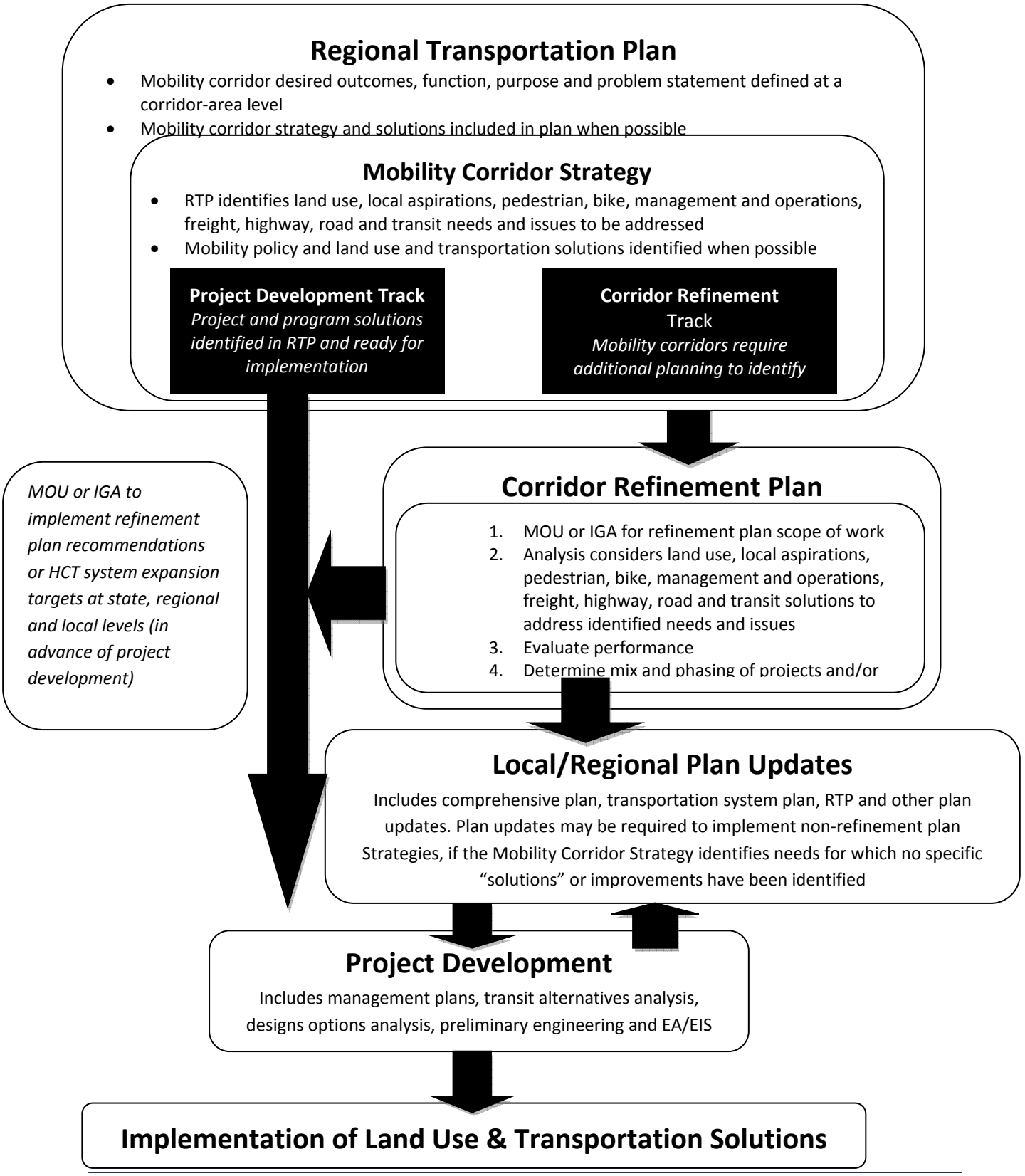
Implement Selected Strategies and Manage Transportation System

The State of Oregon Transportation Planning Rule (TPR) section 660-012-0020 requires that transportation system plans (TSPs) establish a coordinated network of planned transportation facilities adequate to serve regional transportation needs. The RTP serves as the region's TSP. The adoption of the 2035 RTP also requires that local jurisdictions update their TSPs in coordination with the policies and visions established in the RTP. Section 660-012-0025 of the TPR allows a Metropolitan Planning Organization (MPO) to defer decisions regarding function, general location and mode as long as it can be demonstrated that the refinement effort will be completed in the near future.

Congestion management solutions will be implemented in accordance with the prioritized strategies identified in the mobility corridors. For corridors where there is uncertainty surrounding transportation needs, function, and potential solutions, a Corridor Refinement Plan is required. The refinement planning process will provide for comprehensive consideration of land-use, management, walking and biking in addition to transit and highway focused analysis, see **Figure 1.3**. As a result a wider range of strategies and projects will progress through development and implementation at the local, regional, and/or state levels. A corridor refinement plan includes the following steps:

- MOU or IGA for refinement plan scope of work
- Analysis that considers land use, local aspirations, pedestrian, bike, management and operations, freight, highway, road and transit solutions
- Evaluate performance
- Determine mix and phasing of projects and/or land use changes needed to address function and needs
- Local and/or regional plan updates and MOU or IGA to implement refinement plan recommendations at state, regional and local levels
- HCT system expansion targets policy MOU, if applicable.

Figure 1.3 Mobility corridor implementation strategy.



Monitor Strategy Effectiveness

Mobility corridor system performance reports will be prepared every two years in order to monitor the effectiveness of implemented strategies. The performance targets in section 2.3.1 of the 2035 RTP will serve to track how well the region is doing in achieving the plan's goals and objectives. These reports will be published in advance of the allocation process for regional flexible funds. This process will guide future planning and investment priorities through informing project selection in the Metropolitan Transportation Improvement Program and how regional flexible funds are allocated. As a result the performance targets provide policy direction for developing the investment strategy recommended in the 2035 RTP.

1.2 FUTURE STRATEGIES

Infrastructure

Active Transportation

Metro coordinates with regional partners in the Active Transportation Partnership to increase the region's effectiveness in securing funding to complete a region wide network of on-street and off-street bikeways and walkways that are integrated with transit and supported by educational programs. An integrated system of this kind will make active transportation modes (biking, walking, & transit) a more viable option for the average citizen in the Portland Region.

Together with local jurisdictions Metro has identified and begun work on developing active transportation corridors that will create seamless connections between home, work, recreation, and communities within the region. Corridor routes are made up of a variety of facilities including: trails, bike lanes, light rail, and sidewalks. Metro is committed to supporting the Active Transportation Corridors through 25 regional demonstration projects. The demonstration projects range from adding a system of bicycle routes to previously underserved areas, to establishing intermodal connections at MAX stations, to increasing connectivity between existing bicycle and pedestrian facilities. Active Transportation Corridors are further supported by marketing programs such as Safe Routes to School and the City of Portland's SmartTrips program.

High Capacity Transit

Over the last 30 years the Portland Region has lead the way in providing state-of-the-art transit systems to the region. During that time over 50 miles of light rail and 15 miles of commuter rail were constructed. These high capacity transit lines connect far reaching communities across the region. The High Capacity Transit System Plan provides guidance for further investment in the regional transit corridors. The High Capacity Transit System Plan used an extensive evaluation process to identify regional priorities for transit investment over the long-term (30 years) and near-term (4 years). Corridors were screened in order to identify those corridors that could support HCT investment in the next 30 years. Through this process 18 corridors were identified and adopted for evaluation and prioritization by the Metro Council.

Arterial & Freeway Operations

In recognition of the fact that the region cannot build its way out of congestion, Metro has increasingly looked to Transportation System Management & Operations (TSMO) as way to manage congestion and improve reliability of the region's transportation system. The recently adopted regional TSMO plan provides a 10-year investment strategy for system management and operations projects. Investments identified in the TSMO plan focus on four areas:

- *Multi-modal traffic management* – Provides arterial and freeway multimodal traffic management and operations functions including signal timing, access management, arterial performance monitoring and data collection, and active traffic management.

- *Traveler information* – Provides current and forecasted travel conditions information via a variety of sources including web site, mobile devices, phone systems, dynamic message signs, highway advisory radio and via private sources for in-vehicle navigation systems to help people make better informed travel decisions.

- *Traffic incident management* – Provides resources and builds partnerships to foster a coordinated, timely and efficient response to incidents. The strategies are aimed at reducing overall incident duration to restore capacity quickly and reduce secondary crashes.

- *Transportation demand management* - Maximizes investments in the transportation system and relieves traffic congestion by managing travel demand, particularly during peak commute hours. Supports and leverages capital investments in transit, trails, and other infrastructure by marketing travel options to potential riders and users and increasing the share of trips made by transit, walking, cycling and other travel options.

To manage congestion in the region, Metro is looking at number of operational strategies that specifically target arterial and freeway operations. Currently the region has identified active traffic management as a potential strategy to manage the transportation system based on prevailing traffic conditions. Active traffic management is comprised of various elements, which work together in managing the transportation system including variable speed limits, lane control, reversible lanes, and advanced signal systems. Given the limited implementation of active traffic management nationally, preliminary study will be conducted to evaluate the technology and identify potential locations or corridors where active traffic management is most needed and will have the greatest impact. Currently identifying the potential for active traffic management has a planned time frame of 1-5 years with an active traffic management pilot project planned for implementation in 6 to 10 years.

Performance Measurement and Monitoring

In order to continually monitor and evaluate the regional transportation system, Metro is working with regional partners to identify and implement future performance measurement systems. Expanded data collection is a critical part of this effort. TransPort will continue work on planning and implementing performance measurement systems.

PORTAL

PORTAL is a traffic information system developed by Portland State University's ITS Lab. The purpose of the system is to implement the U.S. National ITS Architecture's Archived Data User Service (ADUS) for the Portland Metro area. PORTAL shares U.S. Department of Transportation's vision to improve transportation decisions through the archiving and sharing of ITS generated data. As the regional traffic information data warehouse for the Portland Metro area, PORTAL requires continuous support, maintenance and upgrades. Currently PORTAL is integrated with Google maps and provides facility specific information on:

- Real time traffic speeds
- 15-minute average speeds of last five weekdays
- Live camera images
- Locations of incidents
- Total vehicle miles traveled
- Total vehicle hours traveled
- Average travel time
- Average traffic speed
- 95th percentile travel time
- 95th percentile traffic speed

The next stage in PORTAL development is to link GIS data with PORTAL to increase its capabilities. Future plans call for PORTAL reporting levels of congestion, travel time index, and additional freight, transit, and non-motorized data.

Arterial Performance Measurement

A substantial portion of the region's congestion is experienced on the regional arterial network. However, many of the region's arterials lack the traffic detection and communications infrastructure to adequately measure arterial system performance. As a result, Metro has made it a high priority goal to expand traffic surveillance and transportation system condition data

collection capabilities on arterials throughout the region. Arterial performance measurement in the form of travel times, travel speeds, and potentially origin-destination data will support engineering and planning decision-makers, enabling more efficient investments of limited funds. Provision of this data in real-time or near real-time makes the data even more useful for transportation professionals and the traveling public.

The first project identified in the TSMO plan is envisioned to make use of media access control address (MAC) reading technology at strategic locations to cover the major arterials region wide. This data will be stored and used in a similar fashion to PORTAL. The arterial performance data, such as real-time speeds, will be made available to the public in an easy to use format, such as ODOT's TripCheck website. The data could be used to help predict travel times under recurring or non-recurring events.

Expanding ITS network to include Washington State

In the effort to expand the regional ITS network, Metro will continue to work in close partnership with agencies in Washington State to create connections with ITS networks across the Columbia River. Current discussions have included representatives from state DOT's; transit agencies; and local, county, & regional governments from Oregon and Washington. ITS architecture updates and infrastructure improvements are being coordinated through the bi-state ITS network committee to ensure future projects will be compatible. As the Portland region is a part of the larger Portland-Vancouver Metropolitan area, this bi-state coordination will allow for more fluid management and assessment of the regional transportation system.

Programs

Traveler Information

There exists an ample amount of resources to help travelers in the Portland region decide when, where, and how they wish to travel. TripCheck, ODOT's online traveler information source, provides road conditions, weather alerts, camera images, trip planning, and recently began disseminating travel updates via the social medium Twitter. In addition to its online trip planning tool, TriMet's also provides bus arrival times through the transit tracker phone service. Transit tracker has been well utilized with an average 1.4 million calls every month. Other traveler information sources in the region include dynamic message signs, highway advisory radio, and traffic surveillance cameras.

Metro aims to improve upon the region's traveler information resources by providing more accurate and comprehensive information by route, mode, and time of day. The information system may include system components transmitted via internet, radio, cell phone, or physically on the roadside.

With the improved performance measurement capabilities noted above, not only will more information be disseminated to the travelers but it will be more accurate, reliable, and timely. The TSMO plan identifies funding for traveler information programs that:

- Provide Park & Ride information on TriMet's multimodal trip planning tool
- Enhance TripCheck to integrate arterial travel information
- Improve transit automated vehicle locator data collection

Regional Travel Options

Metro's Regional Travel Options (RTO) Program carries out regional strategies to increase use of travel options, reduce pollution and improve mobility. Regional travel options include all of the alternatives to driving alone – carpooling, vanpooling, riding transit, bicycling, walking and telecommuting. The program maximizes investments in the transportation system and relieves traffic congestion by managing travel demand, particularly during peak commute hours. Outreach efforts serve as a key element of the RTO program. The following is a list of outreach programs and services that promote reductions in drive alone travel.

- *Drive Less/Save More Campaign* – The campaign encourages people to think before they drive in order to reduce single-person car trips, adopt cost-saving driving habits and use travel options for non-work trips. Campaign messages reach target audiences through advertising, publicity and community outreach.
- *Individualized marketing projects* – Individualized marketing projects (also called TravelSmart or SmartTrips projects) encourage reductions in drive-alone auto trips. The concept, used in more than 300 projects around the world, identifies individuals who want to change the way they travel and uses personal, individualized contact to motivate them to think about their travel options.
- *SMART Options Employer and Community Outreach* – The City of Wilsonville SMART Options Outreach Program works with Wilsonville area employers and residents to promote transit and other transportation options.
- *Transportation Management Association (TMA) Program* – TMAs are public-private partnerships to relieve traffic congestion and pollution. There are six TMAs in the region that develop and implement area specific strategies for reducing drive-alone commute trips.

Policy

Land Use

2040 Growth Concept – In 1995, the Portland region adopted the 2040 Growth Concept, the long-range plan for managing growth that integrates land use and transportation planning to reinforce the objectives of both. The unifying theme of the 2040 Growth Concept is to preserve the region's economic health and livability and plan for growth in the region in an equitable,

environmentally-sound and fiscally-responsible manner. The 2040 Growth Concept includes land-use and transportation building blocks as shown in Figure 2.1 of the 2035 RTP. The RTP responds to the 2040 Growth Concept with an approach that views transportation as an integrated and interconnected system that must be completed over time. The plan shifts the emphasis from moving vehicles to moving people and goods and connecting people and places. This integrated system provides for the movement of people by private vehicle, public transit, ridesharing, walking and biking as well as the movement of freight by roads, air, water and rail.

Urban Growth Boundary – Metro is responsible for managing the Portland metropolitan region's urban growth boundary required by Oregon under law. The boundary controls urban expansion onto farms and forests. Land inside the urban growth boundary supports urban services such as roads, water and sewer systems, parks, schools and fire and police protection that create thriving places to live, work and play. Metro is required by state law to have a 20-year supply of land for future residential development inside the boundary. Every five years, the Metro Council is required to conduct a review of the land supply and, if necessary, expand the boundary to meet that requirement.

Urban and Rural Reserves – In 2007, the Oregon Legislature approved Senate Bill 1011. This legislation enabled Metro to identify and designate areas outside the current urban growth boundary as urban and rural reserves. Urban reserves are lands currently outside the urban growth boundary that are suitable for accommodating urban development over the next 50 years. Rural reserves are lands outside the current urban growth boundary that are high value working farms and forests or have important natural features like rivers, wetlands, buttes and floodplains. These areas will be protected from urbanization for the next 50 years.

Climate Action Planning

In 2008-10, a number of requirements for integrating greenhouse gas considerations in the transportation planning process were proposed and debated at the state and federal level. In 2009, the Oregon Legislature passed House Bill 2001, which requires Metro to develop land use and transportation scenarios designed to reduce greenhouse gas emissions (GHGs). The 2009 Legislature also established the Metropolitan Planning Organization Greenhouse Gas Emissions Task Force through House Bill 2186. The task force's recommendations were approved by the 2010 Legislature through Senate Bill 1059. Senate Bill 1059 provides further direction to greenhouse gas scenario planning in the other Oregon MPOs and the Metro region. It also calls for a statewide GHG emission reduction strategy for the light-duty vehicle emissions sector (e.g., cars and light trucks); and calls for the state to develop a toolkit of emission reductions actions that can be implemented by local governments. This work is underway.

Federal climate legislation, with targets and commensurate planning requirements to mitigate GHG emissions remain pending in Congress. In anticipation of future requirements, this RTP includes specific CO_2 reduction targets, policies and actions to reduce the need to drive and improve operations of the transportation system – two primary strategies that have been

identified for the transportation sector. However, more work is needed. Preliminary scenarios modeling conducted in 2008 looked at how vehicle emissions might change over time with different investment choices to illustrate the region's ability to continue to meet current state and federal air quality requirements and state targets to reduce greenhouse gas emissions. None of the scenarios, including the reference scenario, achieved the state targets by 2035.

The region's growing population will make it difficult to achieve the targets without other strategies. The region must identify the land use and transportation strategies needed to meet them. The region will also need to support new technology and conservation measures. The climate change scenarios work in 2010 through 2012 will evaluate a full array of land use and transportation strategies to meet state targets. A preferred set of strategies will be adopted during the next RTP update, triggering local government plan updates and adoption of plan and code revisions consistent with the updated RTP.

Regional Safety Work Program

As part of U.S. DOT's quadrennial certification review of the region's transportation planning practices, Metro received recommendations to better incorporate safety into long-range planning. Metro will work with local jurisdictions and agencies to develop a safety work program. The work program will focus on data collection for plan monitoring, analysis and presentation, context sensitive solutions, and performance measurement. This work will be tied to the region's CMP.

Metro will work with ODOT and members of the Regional Safety Work Group to refine the existing statewide traffic safety data to reflect conditions within the subset of the Metro boundary and develop a regional safety work program by December, 2011, with goals, performance measures, and strategies specific to the MPO.

CFR 450.320	RTP Reference
(a) The transportation planning process in a TMA shall address congestion management through a process that provides for safe and effective integrated management and operation of the multimodal transportation system, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under title 23 U.S.C. and title 49 U.S.C. Chapter 53 through the use of travel demand reduction and operational management strategies.	**RTP Section 1.7 - Growing Congestion.** This section identifies Metro's congestion management process and provides a broad overview of traditional and non-traditional approaches to congestion management employed in the Portland Region. **RTP Section 2 - Transportation System Vision.** Part of the overarching vision of for the RTP is to ensure, among other things, that:…"*the transportation system manages both demand and capacity, employs the best technology, and joins rail, highway, street, bus, air, water, pedestrian and bicycle facilities into a seamless and fully interconnected network.* The vision will be implemented through a variety of strategies and the local, regional, state and federal levels. The regions vision is outlined in the following subsections: • Outcomes based approach to planning • Integrated transportation and land use • Goals and objectives • Regional system definition • Regional system concepts and policies **RTP Section 6.4 - Congestion Management Process** This section provides greater detail on the components of the regions congestion management process. Specifically identifying the eight step process for addressing current and future congestion in the region: 1. Develop congestion management objectives 2. Identify area of application 3. Define system or network of interest 4. Develop performance measures 5. Institute system performance monitoring plan

CFR 450.320	RTP Reference
	6. Identify and evaluate strategies 7. Implement selected strategies and manage transportation system. 8. Monitor strategy effectiveness.
(b) The development of a congestion management process should result in multimodal system performance measures and strategies that can be reflected in the metropolitan transportation plan and the TIP. The level of system performance deemed acceptable by State and local transportation officials may vary by type of transportation facility, geographic location (metropolitan area or subarea), and/or time of day. In addition, consideration should be given to strategies that manage demand, reduce single occupant vehicle (SOV) travel, and improve transportation system management and operations. Where the addition of general purpose lanes is determined to be an appropriate congestion management strategy, explicit consideration is to be given to the incorporation of appropriate features into the SOV project to facilitate future demand management strategies and operational improvements that will maintain the functional integrity and safety of those lanes.	**RTP Section 2.3 - Goals, Objectives, & Targets** The goals, objectives, and targets serve as the framework for the region's congestion management process. **RTP Table 2.4 - Regional Mobility Policy** Defines acceptable levels of congestion during the mid-day and A.M. and P.M. peak periods for transportation facilities and services within the region. Quality of service is defined using volume/capacity ratios. **RTP Section 2.5 - Regional System Concepts and Policies** The concepts and policies provide for travel through a seamless and well-connected system of regional throughways and streets, local streets, freight systems, transit services and bicycle and pedestrian facilities. The concepts and policies emphasize safety, access, mobility and reliability for people and goods and the community-building and place making role of transportation. **RTP Section 2.5.2 - Arterial and Throughway Network Vision** The regional street and throughway system concept contains policy and strategy provisions to develop a complete and well-connected roadway system that provides adequate capacity and supports all modes of travel. Rather than relying principally on levels of congestion to direct how and where to address motor vehicle capacity needs, the concept calls for implementing a well-connected network design that is tailored to fit local geography, respect existing communities and future development and protect the natural environment. Three policies form the vision the arterial and throughway network vision: 1. Build a well-connected network of "complete" streets that prioritize safe and convenient pedestrian and bicycle access

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	2. Improve local and collector street connectivity 3. Maximize system operations by implementing management strategies prior to building new motor vehicle capacity, where appropriate. **RTP Section 4.1 - Mobility Corridors Strategy** Metro's mobility corridor strategy expands the region's focus on mobility from individual facilities to the network of facilities and adjacent land uses they serve. Each of the 24 mobility corridors focuses on the region's network of freeways and highways, including parallel networks of arterial streets, regional bicycle parkways, high capacity transit and frequent bus service. Within each corridor land use and transportation data are presented, enhancing Metro's ability to analyze and compare corridors. Through this, cost effective congestion management strategies and priority investments are identified for each corridor. Each mobility corridor contains descriptive information including: • Corridor function • Corridor characteristics • Regional transportation facilities • Regional 2040 land uses • Summary of needs • Performance measures • RTP investments • RTP investment strategy **RTP Section 5.2 - RTP Performance Measurement System** The performance measurement system initiated with the 2035 RTP establishes an on-going evaluation and monitoring cycle. The performance measures will serve as the dynamic link between RTP goals and plan implementation by formalizing the process of evaluation and monitoring to ensure the RTP advances toward achievement of the region's transportation, land use, economic, and environmental goals. Development of a performance measurement system satisfied both the Oregon Transportation Planning

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	Rule (TPR) and federal requirements to use performance monitoring as part of the region's CMP.
(c) The congestion management process shall be developed, established, and implemented as part of the metropolitan transportation planning process that includes coordination with transportation system management and operations activities. The congestion management process shall include:	**RTP Section 2.5.7 Transportation System Management and Operations (TSMO) Vision** A key component of the region's congestion management process is the recently adopted Transportation System Management and Operations (TSMO) plan. As part of the RTP, the TSMO plan is the region's guide to transportation management and operational strategies. Four RTP policies form the foundation of the TSMO vision: 1. Use advanced technologies, pricing strategies, and other tools to actively manage the transportation system. 2. Provide comprehensive real-time traveler information to people and businesses. 3. Improve incident detection and clearance times on the region's transit, arterial, and throughway network. 4. Implement incentives and programs to increase awareness of travel options and incent change.
(c) (1) Methods to monitor and evaluate the performance of the multimodal transportation system, identify the causes of recurring and non-recurring congestion, identify and evaluate alternative strategies, provide information supporting the implementation of actions, and evaluate the effectiveness of implemented actions;	**RTP Section 5.2 - RTP Performance Measurement System** The 2035 RTP update adopts an outcomes-based approach to monitoring the region's transportation system. Paramount to this approach is a comprehensive system of performance measurement and evaluation. • *Performance Measurement* - The performance targets outlined in **RTP Section 2.3.1** set quantifiable goals for achieving the region's desired policy outcomes. • *Evaluation* The evaluation measures identified in **RTP Table 5.2** measure the change between current conditions and the set of transportation investments the region has chosen to pursue. These measures rely on data generated from the regional travel demand forecast model and MetroScope – the regional land use model. Forecasted outcomes for each measure can be found in **RTP Section 5.3.** Additionally observed data will be used to generate system

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	performance reports every two years for each of the 24 mobility corridors. The following system evaluation measures directly serve to inform the region's congestion management decisions: - Vehicle miles traveled - Delay on the regional freight network - Auto and transit travel times between key destinations - Congested locations Ongoing evaluation is provided through periodic assessment of the regional transportation system, which will help to inform implementation decisions as the quantity and quality of data increases.
(c) (2) Definition of congestion management objectives and appropriate performance measures to assess the extent of congestion and support the evaluation of the effectiveness of congestion reduction and mobility enhancement strategies for the movement of people and goods. Since levels of acceptable system performance may vary among local communities, performance measures should be tailored to the specific needs of the area and established cooperatively by the State(s), affected MPO(s), and local officials in consultation with the operators of major modes of transportation in the coverage area;	**RTP Section 2.3 - Goals, Objectives, & Targets** This section identifies the goals, objectives and targets that serve as the framework for the CMP. The following objectives provide examples of the nexus between the 2035 RTP update and the congestion management process. New to the 2035 RTP update are a set of performance targets that support the outcomes-based framework and the plan's goals and objectives. The targets provide policy direction for developing the investment strategy recommended in **RTP Chapter 3**. Freight Reliability - By 2035 reduce truck vehicle hours of delay truck trip by 10% compared to 2005 Congestion - By 2035 reduce vehicle hours of delay per person by 10% compared to 2005. Travel - By 2035, reduce vehicle miles traveled per person by 10 percent compared to 2005.

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(c) (3) Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions. To the extent possible, this data collection program should be coordinated with existing data sources (including archived operational/ITS data) and coordinated with operations managers in the metropolitan area;	1. **Metro Travel Forecast Division -** Collects second hand transportation data from various sources, including: • VMT data from ODOT & FHWA. • Cutline count information from the City of Portland, Multnomah County, Washington County, Clackamas County, and ODOT. • Vehicle classification traffic count data from ODOT – includes several truck classifications. • Automated traffic recorder data from ODOT for 18 locations in the Portland area, plus similar data from the Washington DOT. • Volume and classification traffic counts from the Port of Portland's annual report. • Texas Transportation Institute's data for Portland - from their Urban Mobility Study. • Consumer price index data for Portland-Salem and the National CPI. • Oregon motor vehicle registrations and drivers license data • Population and employment data from Metro's data resource center and Portland State University. • Parking costs data for the Portland central business district and the Lloyd district. • National driving costs data from AAA. • TriMet transit fare survey data and monthly transit performance reports. • ODOT daily road reports. • Weekly road report and Oregon gas prices listing. • Washington speed data. • Oregon fuels tax reports for Washington and Multnomah counties. 2. **Metro Data Resource Center –** Acts as a research group within Metro's planning and development department. DRC has created the regional land information system (RLIS), a GIS application that supports transportation modeling and regional planning applications. It includes land parcel data from the 25 cities and 3 counties that a located within Metro's planning boundary. The DRC also conducts: • Detailed models and forecasts for trends in transportation and land use using demographic and economic data.

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	• Employment forecasting. • Economic and demographic modeling. • Visualization research. 3. **Portland State University –** The ITS lab at PSU houses the Portland Oregon Regional Transportation Data Archive Listing (PORTAL). Portland is an expansive transportation data archive that serves as the region's traffic information warehouse. Included in PORTAL are current and past freeway data for: travel speeds, congestion, incidents and weather. Currently PORTAL is in the process of obtaining freight and transit data.

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(c) (4) Identification and evaluation of the anticipated performance and expected benefits of appropriate congestion management strategies that will contribute to the more effective use and improved safety of existing and future transportation systems based on the established performance measures. The following categories of strategies, or combinations of strategies, are some examples of what should be appropriately considered for each area: i. Demand management measures, including growth management and congestion pricing; ii. Traffic operational improvements; iii. Public transportation improvements; iv. ITS technologies as related to the regional ITS architecture v. Where necessary, additional system capacity;	**RTP Section 4.2 - Mobility Corridors Strategies** The mobility corridors strategy reinforces the outcomes-based approach in the 2035 RTP update. In all 24 mobility corridors, multimodal performance evaluation findings are identified for each of the four different systems: 2005 base year, 2035 no build, 2035 RTP federal priorities, and 2035 RTP investment strategy. Evaluation findings are based on Metro's travel forecast model and include the following performance measures: • Vehicle miles traveled • Total traffic delay on the regional freight network • Total cost of traffic delay on the regional freight network • Automobile travel time between key origin-destinations • Transit travel time between key origin-destinations • Locations of congestion • Mode share for walking, biking, transit, and shared-ride • Transit productivity
(c) (5) Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy (or combination of strategies) proposed for	**RTP Section 4.2 Mobility Corridor Strategies** Each corridor strategy documents system needs, functions, solutions to address needs, and investment strategies. Mobility corridor strategies contain RTP projects by cost and mode for both the federal and state systems. The 2035 RTP investment strategy is broken into three time horizons: near term (1-4 years), medium term (5-10 years), and long term (10-25 years). Within each time horizon, specific

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implementation; and	strategies are identified for improving mobility in the corridor. **RTP Section 6.3 Implementation of Mobility Corridor Strategy** This section clearly documents how the mobility corridors strategy will be implemented as part of the RTP.
(c) (6) Implementation of a process for periodic assessment of the effectiveness of implemented strategies, in terms of the area's established performance measures. The results of this evaluation shall be provided to decision makers and the public to provide guidance on selection of effective strategies for future implementation.	**RTP Section 5.2.1 - RTP System Evaluation** The performance measurement system introduced with the 2035 RTP update adopts an outcomes-based performance evaluation and substantially broadens the performance measures applied to track how well the investment strategy addresses the full set of goals and objectives. The RTP system evaluation has two levels: performance targets and investment strategy performance evaluation. The performance targets set quantifiable goals for the achieving the region's desired policy outcomes. In comparison, investment strategy evaluation measures changes between current conditions and the set of transportation investments the region has chosen to pursue. There is some overlap between the targets and the measures but they serve different functions. The performance targets are listed in Table 2.3 of Chapter 2 of the 2035 RTP. **RTP Section 5.2.2 - RTP System Monitoring** The biggest challenge for establishing and maintaining a monitoring program has been the availability of data. Historically, collecting and managing data has been expensive and difficult. With advancements in ITS in the region, more and better data is available today and will continue to grow with implementation of data collection projects identified in the Regional TSMO plan. The RTP system monitoring program will report on current conditions using observed data for each of the 24 mobility corridors. A system

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	performance report will be prepared every two years in advance of the allocation process for regional flexible funds. The report will also inform the existing conditions element that is prepared in advance of future RTP updates to assess whether the region is moving in the right direction and identify possible policy or strategy adjustments that may be needed. Table 5.2 in the 2035 RTP lists recommended performance monitoring measures that will be the focus of the system monitoring effort.
(d) In a TMA designated as nonattainment area for ozone or carbon monoxide pursuant to the Clean Air Act, Federal funds may not be programmed for any project that will result in a significant increase in the carrying capacity for SOVs (*i.e.*, a new general purpose highway on a new location or adding general purpose lanes, with the exception of safety improvements or the elimination of bottlenecks), unless the project is addressed through a congestion management process meeting the requirements of this section.	**Carbon Monoxide -** The current status, as determined by the US EPA as of January 6, 2010, is that the Metro area has a maintenance status for Carbon Monoxide. (For the region's Carbon Monoxide status, see the EPA's Green Book located at: http://www.epa.gov/oar/oaqps/greenbk/cmcs.html#OREGON. **Ozone –** The region is no longer subject to the 1-hour ozone standard and the region no longer has a requirement to complete air quality conformity for ozone. The region, however, is still considered in a maintenance status with regard to ozone. For the region's Ozone status see: http://www.epa.gov/oar/oaqps/greenbk/omcs.html#OREGON (1 hour) and http://www.epa.gov/oar/oaqps/greenbk/fmcs.html#OREGON (8 hour).
(e) In TMAs designated as nonattainment for ozone or carbon monoxide, the congestion management process shall provide an appropriate analysis of reasonable (including multimodal) travel demand reduction and operational management strategies for the	The Regional Transportation Functional Plan (RTFP) directs how cities and counties will implement the Regional Transportation Plan (RTP) and its constituent freight, high-capacity transit and transportation system management and operations plans. RTFP section 3.08.220A requires local governments to consider non-auto capacity improvements and strategies prior to motor vehicle capacity improvements to address transportation needs in the following order: 1. TSMO strategies, including localized TDM, safety, operational and access management improvements;

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corridor in which a project that will result in a significant increase in capacity for SOVs (as described in paragraph (d) of this section) is proposed to be advanced with Federal funds. If the analysis demonstrates that travel demand reduction and operational management strategies cannot fully satisfy the need for additional capacity in the corridor and additional SOV capacity is warranted, then the congestion management process shall identify all reasonable strategies to manage the SOV facility safely and effectively (or to facilitate its management in the future). Other travel demand reduction and operational management strategies appropriate for the corridor, but not appropriate for incorporation into the SOV facility itself, shall also be identified through the congestion management process. All identified reasonable travel demand reduction and operational management strategies shall be incorporated into the SOV project or committed to by the State and MPO for implementation.	2. Transit, bicycle and pedestrian system improvements; 3. Traffic-calming designs and devices; 4. Land use strategies; 5. Connectivity improvements to provide parallel arterials, collectors or local streets that include pedestrian and bicycle facilities,; 6. Motor vehicle capacity improvements, only upon a demonstration that other strategies in this subsection are not appropriate or cannot adequately address identified transportation needs. In addition, local governments are required to document why they selected particular strategies or improvements and why they did not select other strategies in their local transportation plan.

(f) State laws, rules, or regulations pertaining to congestion management systems or programs may constitute the congestion management process, if the FHWA and the FTA find that the State laws, rules, or regulations are consistent with, and fulfill the intent of, the purposes of 23 U.S.C. 134 and 49 U.S.C. 5303.	The Oregon Highway Plan (OHP) has several policies that establish general mobility objectives and approaches for maintaining mobility: • **Policy 1A** (State Highway Classification System) describes in general the functions and objectives for several categories of state highways. Greater mobility is expected on Interstate and Statewide Highways than on Regional and District Highways. • **Policy 1B** (Land Use and Transportation) has an objective of coordinating land use and transportation decisions to maintain the mobility of the highway system. The policy identifies several land use types and describes in general the levels of mobility appropriate for each. • **Policy 1C** (State Highway Freight System) has an objective of maintaining efficient through movement on major truck Freight Routes. The policy identifies the highways that are Freight Routes. • **Policy 1G** (Major Improvements) has the purpose of maintaining highway performance and improving highway safety by improving system efficiency and management before adding capacity. Mobility standards are established by the Highway Mobility Standards Policy (1F) consistent with the above OHP policies. The Highway Mobility Standards Policy applies mainly to transportation and land use planning decisions. The policy identifies three uses for the highway mobility standards: • Planning: identifying state highway mobility performance expectations for planning and plan implementation; • Review of amendments to comprehensive plans and land use regulations: maintaining consistency between desired highway performance and the type of land use development; and • Making traffic operations decisions such as managing access and traffic control systems to maintain acceptable highway performance.