PERFORMANCE MEASURES ADVISORY GROUP INTERIM REPORT AND RECOMMENDATION

Final Report — January 14, 2010

January 2010

Columbia River CROSSING

Title VI

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TABLE OF CONTENTS

Appendices

ACRONYMS

ACS	American Community Survey
ADA	Americans with Disabilities Act
BIA	Bridge Influence Area
CRC	Columbia River Crossing
CTR	Commute Trip Reduction
DEIS	Draft Environmental Impact Statement
ECO	Employee Commute Options
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	Greenhouse Gas
GPS	Global Positioning System
GTEC	Growth and Transportation Efficiency Center
HOV	High-Occupancy Vehicle
HOT	High-Occupancy Vehicle or Toll
I-5	Interstate 5
LOS	Level of Service
LPA	Locally Preferred Alternative
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
ODOT	Oregon Department of Transportation
PBAC	Pedestrian and Bicycle Advisory Committee
PMAG	Performance Measures Advisory Group
PSC	Project Sponsors Council
RTC	Regional Transportation Council

RTP	Regional Transportation Plan
SOV	Single-Occupancy Vehicle
TDM	Transportation Demand Management
TMA	Transportation Management Association
TSM	Transportation System Management
UGB	Urban Growth Boundary
VMT	Vehicle Miles Travelled
WSDOT	Washington Department of Transportation

1. Executive Summary

This report is an interim product of the Performance Measures Advisory Group (PMAG). PMAG was established by the Columbia River Crossing's (CRC) Project Sponsors Council (PSC). PSC intended for PMAG to provide technical advice to be used by a bi-state, multi-agency Mobility Council, the concept of which was also initiated by the PSC.

PMAG was charged with developing performance measures to help assure that the objectives of the CRC project would be realized and negative consequences would be avoided. The CRC project is a multi-modal project in a 5-mile corridor that seeks to implement highway improvements, high-capacity public transit, and improvements for bicyclists and pedestrians.

With its primary focus on how the facility should be operated and managed over time, PMAG developed goals, objectives and performance measures that could be used by the Mobility Council to monitor and actively manage this multi-modal facility.

PMAG developed goals and goal statements in six areas:

- **System Access, Mobility, and Reliability** – Maximize access through efficient and reliable movement of people and goods through the corridor.
- **Financial Responsibility and Asset Management** – Ensure sufficient revenue to maintain financial solvency; maintain assets at their lowest life-cycle costs; support re-investment in programs and infrastructure; and fund operations and transportation options that extend the operational life of the facilities.
- **Climate, Energy Security, and Health -** Reduce project-related energy consumption, GHG emissions, air pollution, and other environmental impacts.
- **Safety and Security -** Minimize the occurrence of crashes, especially those involving fatalities and serious injuries, and maximize the safety and security of project-related system users and surrounding communities.
- **Economic Vitality -** Enhance economic vitality of the region by facilitating efficient freight / goods movement and improving multimodal access between businesses, labor markets, and job centers.
- **Land Use** - Support prevailing state and local land use goals and policies and multimodal access to jobs, services and residences.

Twenty two objectives were identified in support of the goals. The titles of the objectives are listed below. The full language of each can be found in Section 4 of this report.

- Reliability
- Mobility
- Mode Choice
- Demand Management
- System Impacts
- System Equity
- Solvency
- Operations, Maintenance, and Asset Management
- Air Pollutants
- Greenhouse Gases
- Fuel Consumption
- Public Health Equity
- Security
- Safety

- Cost of Goods Movement
- Access to Freight Facilities
- Access to Jobs and Markets
- Interchange Capacity
- Balanced Lane Use and Transportation
- Smart Growth
- Industrial Lands

In a subsequent phase, the goals and objectives would be further supplemented by performance measures and targets. Performance measures and targets are intended to help monitor and assess whether the project is operating according to expectations and avoiding significant negative consequences. In addition, the performance measures are intended to provide a basis upon which corrective action can be based.

Given the ambitious schedule of reporting to the Project Sponsors Council by January 2010, PMAG did not have sufficient time to define performance measures or numeric targets to support many of Goals and Objectives. In some cases this is due to a lack of baseline data; in others cases, policy direction or at least confirmation of policies is required. Draft Performance measures and targets discussed by PMAG are included in an appendix and can serve as a starting point for future efforts.

PMAG's report includes the identification of data sources that may be used and some additional data needs. It also identifies some of the tools that may be used to influence the operation of the facilities in the corridor and others that could be affected by those actions.

PMAG recommends and requests acceptance or modification by PSC of the Goals and Objectives. In addition, PMAG seeks additional policy guidance to be used to advance the work toward final Performance Measures and Targets. To help achieve this, PMAG identifies some Future Steps in Section 7 of this report. Among these steps, PMAG suggests additional policy direction to define the relationship among the parties, clarifying and extending the role of PMAG to advance the technical work, and further clarification of implementation responsibilities.

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2. Introduction

The Columbia River Crossing (CRC) project is intended to provide multimodal transportation benefits in the Interstate 5 (I-5) corridor. During the process of selecting, refining, and advancing the CRC project, concerns have been raised whether benefits from the proposed improvements will be offset by negative impacts that may result from major transportation investments.

Some stakeholders believe that the project will produce fundamental changes to the transportation activity in the corridor by the introduction of new features, such as high-capacity public transit, partly along dedicated rights-of-way, and new, modern facilities for use by bicyclists and pedestrians. In addition, the project is planned as a toll facility that could use peak period tolls, active transportation demand management, and transportation system management to help achieve performance objectives over time as traffic growth occurs. Matched with high densities in key areas including Hayden Island and downtown Vancouver, these stakeholders believe that the corridor will provide multimodal options that represent a significant change from the current reality where automobile traffic is the overwhelming choice for travel and where few other options are currently available.

At the same time, other stakeholders believe the project being advanced represents a continuation of past trends with continued reliance on the automobile with all of its related problems such as increased urban sprawl, air and climate pollution, degraded quality of life for those living along the corridor and delays for freight traffic resulting from additional commuter traffic. These stakeholders point to provisions of the project that increase the vehicular capacity of the highway and contend that these will induce more and longer-distance automobile travel and additional traffic demand that cannot be accommodated on the central Portland street and freeway system.

Few disagree with the need for significant improvements in the corridor to correct significant safety problems, reduce seismic vulnerability of the existing bridges, and eliminate the existing lift-span bridges that must be raised to accommodate marine traffic on the Columbia River. Finally, there is general agreement that improvements are needed in the corridor to accommodate planned growth of the region and especially in accommodating freight movements that are an important component of the regional economy. There are, however, disagreements on whether certain elements of the project intended to solve one problem will have negative consequences for the region and conflict with state, regional, or local goals.

2.1 Establishment of a Mobility Council

In recognition of the existence of these divergent views and those that fall between them, the CRC's Project Sponsors Council (PSC) endorsed the concept of a Mobility Council to oversee management of the corridor. The idea behind the Mobility Council is to assure that the project operates consistently with the expectations and with the assumptions, such as population and employment forecasts and the adopted land use and transportation plans for the region.

The Mobility Council would have representation from the Washington and Oregon Departments of Transportation, the Cities of Portland and Vancouver, TriMet, C-TRAN, Metro and the Regional Transportation Council (RTC), the Port of Vancouver and the Port of Portland. Inclusion of these agencies in the Mobility Council is intended to assure a multimodal approach to management of the corridor. The PSC's Columbia Crossing Mobility Council Concept adopted by the PSC on March 6, 2009 is included as Appendix A.

According to PSC's concept, "The purpose of this Mobility Council is to provide recommendations to the DOTs and transit agencies on ways to actively manage mobility for all modes of transportation on the Columbia River crossings and their adjoining city streets and highways." According to the PSC's concept, "the Mobility Council's annual recommendations may include, but are not limited to, tools such as toll rate structures, travel and auxiliary lane uses and accesses, applicable transit policies, and transportation demand management (TDM) strategies."

This multimodal emphasis would help coordinate the activities of the service providers and recommend joint strategies that affect all transportation services in the corridor through the Mobility Council's recommendation of a "Columbia Crossing Mobility Operations Plan." Depending on how its role develops, the Mobility Council could also monitor and potentially comment on other regional issues such as land use, employment, and residential development. Through monitoring and active management, the Mobility Council could help to assure that the desired outcomes are realized.

2.2 Establishment of PMAG

To assist the Mobility Council on technical issues, the PSC also created the Performance Measures Advisory Group (PMAG) at its May 4, 2009 meeting. According to the minutes of that meeting a formal vote was not taken, but "PSC members generally concurred with the process, as outlined in the handout, for the creation of the working group." The "Performance Measurement Technical Working Group" handout discussed at the PSC meeting and dated 5/1/09, is included as Appendix B.

Performance measures, which have been used in the management of transportation systems for more than a decade, have become increasingly important. According to one of the Resource Papers presented at a Transportation Research Board Performance Measures Conference, "Performance measurement is being applied widely in many transportation agencies and often extends well beyond the performance of the transportation system itself."[1]

Establishing performance measures in advance of the implementation of the CRC project and developing them for management of this bi-state, multimodal corridor shows that the project partners are committed to both the implementation of the CRC project and will establish and perpetuate the management of the corridor to meet regional, multi-modal performance objectives.

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[1] Steven Pickrell and Lance Neuman, "Use of Performance Measures in Transportation Decision Making" Resource Paper, included in Conference Proceedings 26 – Performance Measures to Improve Transportation Systems and Agency Operations by Transportation Research Board

The following is quoted from the "Background" section of the Performance Measurement Technical Working Group materials discussed by PSC on May 4, 2009:

"Issues of importance to the Project Sponsors Council that prompted their request for transportation performance measures include:

- Protect investments in the corridor;
- Maximize system capacity and efficiency of I-5 in the Portland/Vancouver area;
- Reduce transportation-related greenhouse gas emissions; and
- Minimize induced demand and growth."

The following is quoted from the "Purpose" section of the same materials discussed by PSC on May 4, 2009:

"The Performance Measures Technical Working Group will be responsible for:

- Developing reasonable and measureable transportation performance measures to ensure optimal long-term performance and management of the Columbia River crossing, including:
    - Safety in the corridor;
    - Effective management of Interstate 5 and related arterials and highways; and
    - Predictable and reliable trips for the multimodal transportation system."

2.3 Composition of PMAG

The members of PMAG approved by the PSC consisted of agency representatives, national experts on performance measures and a facilitator. PMAG members and their affiliations approved by PSC were:

- Scott Chalkley, Performance Management Program Manager, Oregon Department of Transportation (ODOT)
- Rob Fellows, Toll Planning and Policy Manager, Washington State Department of Transportation (WSDOT)
- Andy Cotugno, Planning Director, Metropolitan Service District (Metro)
- Dean Lookingbill, Transportation Director, Southwest Washington Regional Transportation Council (RTC)
- Peter Hurley, Transportation Options Project Manager, Office of Transportation, City of Portland
- Phil Wuest, Transportation Services, City of Vancouver
- Eric Hesse, Strategic Planning, TriMet
- Scott Patterson, Director of Development and Public Affairs, C-TRAN

- Suzie Lahsene, Senior Manager, Transportation and Land Use Policy, Port of Portland
- Katy Brooks, Community Planning and Outreach Manager, Port of Vancouver
- Ginger Goodin, Senior Research Engineer, Texas Transportation Institute (Expert on managed lanes, HOT lanes, HOV lanes, and tolling)
- Thomas Brennan, Principal at Nelson\Nygaard Consulting Associates (Expert on transit and multi-modal systems and performance)
- Angus Duncan, Chair, President, & CEO, Oregon Global Warming Commission, and President of the Bonneville Environmental Foundation (Expert on global warming and environmental issues)
- Daniela Bremmer, Director, Strategic Assessment Office, Washington Department of Transportation and Chair of Transportation Research Board Performance Measurement Committee (Expert on system performance measurement)
- Steve Pickrell, Cambridge Systematics (Facilitator)

2.4 Overview of the Columbia River Crossing Project

The CRC project is a multimodal corridor improvement project in Portland, Oregon, and Vancouver, Washington. It focuses on improvements along a 5-mile segment of I-5. Approximately 2.8 miles are in Washington and about 2.0 in Oregon.

The CRC project is a multimodal project designed to:

1. Provide fixed-route, high-capacity transit;
2. Increase the capacity and improve safety for motor vehicle traffic, including freight traffic in the I-5 corridor;
3. Correct safety and structural deficiencies associated with the existing bridges;
4. Avoid interference between river traffic and highway traffic; and
5. Improve facilities for non-motorized traffic.

The planned highway element of the CRC project is to increase the through capacity across the river and to provide for three southbound and three northbound through lanes through the study area. The modification of interchanges is needed to:

1. Accommodate three lanes in each direction intended to serve through traffic;
2. Solve or, to the greatest extent possible, improve the geometric and safety elements of the existing interstate facility; and
3. Increase the functionality and capacity of the existing interchanges to avoid or minimize as much as possible, the potential for the existing interchanges to interfere with operations and safety in the interstate corridor.

The need for capacity improvements in the corridor has long been recognized and is documented in a variety of adopted transportation plans and studies. Studies undertaken to identify issues and needs in the corridor include the *Portland/Vancouver I-5 Trade Corridor Freight Feasibility and Needs Assessment,* completed in January 2000. The *Portland/Vancouver I-5 Transportation and Trade Partnership Final Strategic Plan,* completed in June 2002, recommended fixing three bottlenecks, including the I-5 crossing of the Columbia River. The CRC project is specifically identified as a project in the locally adopted, long-range transportation plans, including Metro's Regional Transportation Plan (RTP), adopted in June 2004, and RTC's Metropolitan Transportation Plan (MTP), adopted in 2007 and amended in 2008. Metro and RTC are the designated Metropolitan Planning Organizations (MPO) for the Portland, Oregon, and Vancouver, Washington, areas, respectively.

A Draft Environmental Impact Statement (DEIS) has been prepared for improvements along a 5-mile corridor. The DEIS for the CRC project was released in May 2008, and describes the potential effects of five alternatives on community, natural, and historic resources. It is worth noting that travel demand projections, including traffic volumes, transit use, and bicycle use are based on the adopted land use and transportation plans of the partner agencies. The regional transportation model was used as the basis for forecasting future travel.

The project has six local project partners (the Cities of Portland and Vancouver, TriMet, C-TRAN, RTC, and Metro) and two federal co-leads (Federal Highway Administration (FHWA) and Federal Transit Administration (FTA)). The project partners considered the DEIS, public comment, and the CRC Task Force (a 39-member group established to advise WSDOT and ODOT on project issues) recommendation to select a Locally Preferred Alternative (LPA) in July 2008. The partner agencies endorsed a replacement bridge with light rail extending to Clark College in Vancouver.

Additional public input, project design, and analysis will be reflected in a Final Environmental Impact Statement (FEIS), expected in mid 2010. The FEIS will describe the additional analysis on potential community and environmental effects of the project and will include responses to comments received during the DEIS public comment period.

2.5 Purpose of this Report

This report provides background on the work conducted by PMAG and presents its interim recommendations. It was acknowledged by PMAG that this group, with a limited period in which to conduct its work and present a recommendation, is a starting point. Follow-on work, including specifying needed data, baseline data collection efforts, identification of more specific targets, and the application of appropriate tools will need to come later.

Additional data collection will help set an accurate baseline against which to track future conditions. Good baseline data will also allow a better assessment of the effect of project decisions and a comparison to future expected conditions.

PMAG identified the need for appropriate bodies to provide policy guidance or resolve potential conflicts among the goals, objectives, and targets. For the most part, PMAG focused on providing the "road map" by recommending performance measures so that data could be

acquired, monitoring performed, analyses conducted, and finally, if needed, actions taken by the Mobility Council or by appropriate agencies.

It is also worth noting that the PMAG's recommendations on performance measures focus on the multimodal aspects of corridor operations. Since service providers, such as the transit operators and the state departments of transportation, already use performance measures extensively, PMAG's performance measures are not all inclusive. They supplement rather than replace those used by individual providers. Additional discussion is provided in the body of this report.

An additional purpose for which performance measures may be utilized is to inform the design process. As an extraordinarily large project that includes improvements for several modes of transportation, the selection and refinement of the design is lengthy and complex. This is due, in part, to the project being multimodal with both highway and transit elements. Further complications result from topographic and physical constraints and from the fact that the project seeks to implement solutions to an existing interstate highway in an intensively developed urban corridor. Due to time constraints related to the preparation of the Final EIS and advancement toward the preliminary engineering phase of the project, the effort undertaken by PMAG coincides with a major effort to refine the design of key project elements. These simultaneous efforts allow for consideration of PMAG's performance measure recommendations to inform the design process and in the future, support decisions to make design modifications or implement phasing options.

2.6 Future Activities Related to Performance Measures

As noted above, some additional guidance may be needed on policy issues. Further technical work will be needed to refine the targets associated with performance measures. Additional data collection and protocols will be needed.

The Mobility Council's responsibilities and relationship with other bodies, such as the Washington Transportation Commission and Oregon Transportation Commission, may need to be clarified. A means of providing technical guidance, such as a permanent technical committee, may be needed.

After performance measures and targets are selected, adopted, and tracked, it is likely that certain actions will be needed in response. The Mobility Council may need to make recommendations to several agencies. Some actions will lie within the authority of the DOTs; some will be within the authority of partner transportation agencies including the transit providers and cities; others could be within the authority of land use and environmental permitting agencies. The manner in which such actions are implemented could vary.

Finally, as it seeks to employ an active management strategy, the Mobility Council will need to continuously monitor and assess the results of the management actions it undertakes or recommends to the implementing agencies.

To accomplish these activities, PMAG identified several tasks that are further described in Section 7 of this report. PMAG recommends action in two broad areas:

- PSC acceptance, with modification as necessary, of PMAG's Goals and Objectives; and
- Providing policy guidance, and establishing the structure and formal relationships by which work on Performance Measures can be advanced, adopted and implemented.

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3. Relationship to the Overall CRC Project

As explained in the Introduction, the concept of a Mobility Council and the use of performance measures are intended to monitor and optimize transportation systems performance in the corridor and in the region. These uses should be considered in the context of the overall project that is being developed through the National Environmental Policy Act (NEPA) process that includes multiple steps and products.

3.1 CRC Purpose and Need

As introduced in the previous section, the CRC project is designed to address several complex and interrelated issues. This is most fully explained in the project's Purpose and Need statement.

A summary of the explanation from the CRC project's *Purpose and Need Statement*, adopted in 2006, is presented below.

- **Growing Travel Demand and Congestion:** Existing travel demand exceeds capacity in the I-5 Columbia River crossing and associated interchanges. This corridor experiences heavy congestion and delay lasting 2 to 5 hours during both the morning and afternoon peak travel periods and when traffic accidents, vehicle breakdowns, or bridge lifts occur. Daily traffic demand over the I-5 crossing is projected to increase by 40 percent during the next 20 years, with stop-and-go conditions increasing to at least 10 to 12 hours each day if no improvements are made.
- **Impaired Freight Movement:** I-5 is part of the National Truck Network, and the most important freight freeway on the West Coast. In the center of the project area, I-5 intersects with the Columbia River's deep water shipping and barging as well as two river-level, transcontinental rail lines. Vehicle-hours of delay on truck routes in the Portland-Vancouver area are projected to increase by more than 90 percent over the next 20 years. Growing demand and congestion will result in increasing delay, costs, and uncertainty for all businesses that rely on this corridor for freight movement.
- **Limited Public Transportation Operation, Connectivity, and Reliability:** Due to limited public transportation options, a number of transportation markets are not well served. Current congestion in the corridor adversely impacts public transportation service reliability and travel speed. Travel times for public transit using general purpose lanes on I-5 in the bridge influence area are expected to increase substantially by 2030.
- **Safety and Vulnerability to Incidents:** The I-5 river crossing and its approach-sections experience crash rates nearly 2.5 times higher than statewide averages for comparable facilities. Incident evaluations generally attribute these crashes to traffic congestion and weaving movements associated with closely spaced interchanges. Without breakdown lanes or shoulders, even minor traffic accidents or stalls cause severe delay or more serious accidents.

- **Substandard Bicycle and Pedestrian Facilities:** The bike/pedestrian lanes on the I-5 Columbia River bridges are 3 to 4 feet wide, narrower than the 10-foot standard, and are located extremely close to traffic lanes thus impacting safety for pedestrians and bicyclists. Direct pedestrian and bicycle connectivity are poor in the bridge influence area (BIA).
- **Seismic Vulnerability:** The existing I-5 bridges are located in a seismically active zone. They do not meet current seismic standards and are vulnerable to failure in an earthquake.

3.2 Relationship of Performance Measures and Key CRC Elements

The CRC project is a multimodal project that will implement improvements to the highway system, the public transit system, and make improvements specifically for bicyclists and pedestrians.

Highway improvements included in the project will improve safety, provide reliability, and increase capacity consistent with the regional growth and development assumptions. From the beginning, the corridor has been intended to provide three through lanes in each direction with appropriate auxiliary lanes to accommodate the weaving and merging movements between the closely-spaced interchanges. Tolling of the facility has also been assumed from the beginning, primarily to help generate revenue to pay off bonds needed to fund the project and, in part, to moderate demand for driving in the corridor. Various tolling scenarios have been developed with different rates and with rates that vary by time of day. Discussions of tolling are ongoing and no recommendations have been developed at this time. Ramp metering, which is already in use at several ramps in the study area, is considered a key to management of the corridor. Ramp metering is assumed to be carried forward in the design to assure adequate traffic operations of the I-5 mainline.

Improvements to the highway network were also specifically tailored to meet the needs related to movement of freight. Critical factors for freight include freight travel time, reliability, and access to major generators. The project seeks to serve the high-volume freight movements, minimize opportunities for delays, and accommodate the physical needs of large, over-the-road trucks that have different operating characteristics, especially as it relates to turns and grades. These factors influenced the design of ramps, intersections, and interchanges.

Major improvements will be made to the public transit operations in the corridor. Currently, transit buses, which provide the only public transportation in the corridor, are limited in number and, for the most part, suffer from the congestion and delays encountered by general traffic. The project will include high-capacity, fixed-route public transit – an extension of TriMet's MAX light rail system from its current terminus at the Expo Center to Hayden Island, downtown Vancouver, with a termination at Vancouver's Clark College. Park-and-ride facilities are identified at key locations in Vancouver. This new high-capacity service, separated from motor vehicles for key portions of the line, will offer real options for people desiring an alternative to the automobile for their trips in the corridor.

The project is also being designed to provide superior facilities for bicyclists and pedestrians – a huge contrast to the existing, substandard facilities. Replacing the very narrow, exposed, and uncomfortable facilities with a modern facility is expected to produce dramatic results. The project also seeks to replace some of the circuitous routing leading to the current bridge with better, more direct connections. Like the provision of new transit service, the physical improvements for bicyclists and pedestrians are expected to provide new options for those seeking alternatives to the automobile for their trips.

The performance measures developed and recommended by PMAG are intended to help manage the system and realize the potential offered by the extended transit system and the improved facilities for the bicyclists and pedestrians. The performance measures are also intended to help prevent single-occupant automobiles from using up the highway capacity improvements intended to accommodate freight traffic that is critical to the region's economy.

In general, the performance measures are designed to help the corridor achieve the desirable outcomes and reduce negative consequences.

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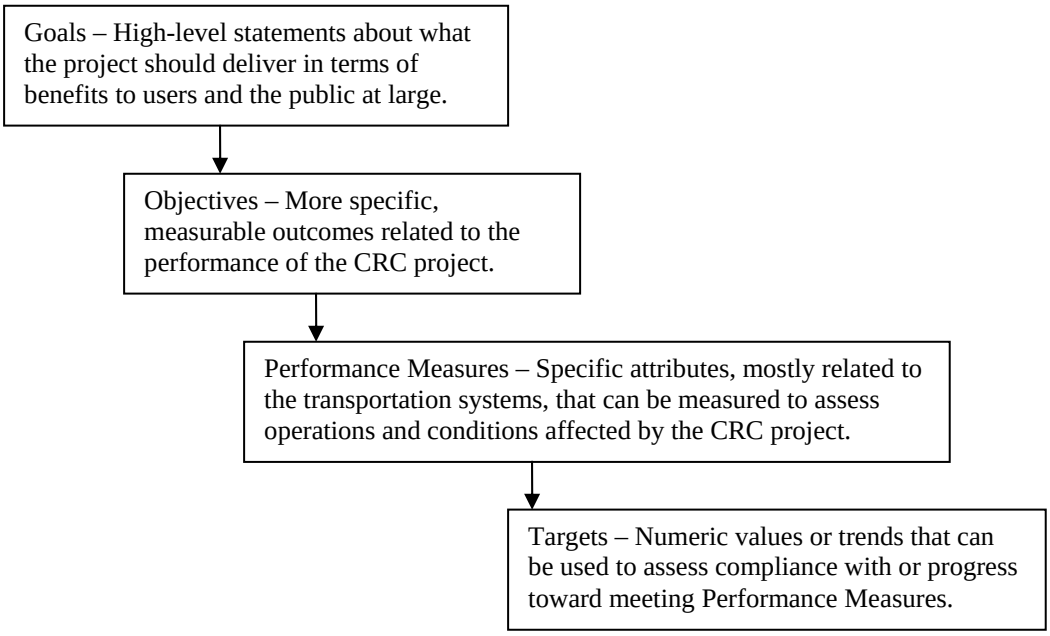
4. PMAG Goals, Objectives, and Performance Measures

This section presents a framework developed by the PMAG that will ultimately lead to a comprehensive and systematic approach for measuring and evaluating performance of the CRC project. Due to the complexity of the project, its multi-modal focus, and its regional importance, PMAG elected to focus its efforts on the development of a framework to guide future efforts. This framework, with Goals and Objectives, is an interim product that can be built upon and refined in subsequent efforts that will produce more specific performance measures and targets.

In establishing this framework, PMAG achieved consensus on Goals and Objectives. These will ultimately be supplemented by Performance Measures and Targets that can be used to directly measure and evaluate the performance of the facilities.

The relationship and hierarchy of these are depicted in Figure 4.1 and are explained in additional detail below.

Figure 4.1. Relationship of Goals, Objectives, Performance Measures and Targets



The goals and supporting objectives developed by PMAG tend to focus on how the facilities would operate with a lesser emphasis on how the CRC project would be designed. PMAG's Goals and Objectives, for example, emphasize ways of ensuring high utilization of public transit use and alternative modes of travel with management actions that take advantage of the new and upgraded facilities for these modes.

Design-related issues are primarily dealt with though the National Environmental Policy Act (NEPA) process and the preparation of a draft Environmental Impact Statement (DEIS) and final Environmental Impact Statement (FEIS). As a result, some design issues, such as seismic vulnerability, one of the key reasons for undertaking the CRC project as presented in the project's adopted Purpose and Need Statement are not addressed in PMAG's Goals and Objectives.

Overall, PMAG's Goals and Objectives are intended to supplement and be consistent with state, regional, and local policy direction as well as the project's broader goals and objectives. PMAG's Goals and Objectives emphasize the operational aspects while recognizing some overlap between the design and operation of the facilities.

Given the ambitious schedule of reporting to the Project Sponsors Council by January 2010, PMAG did not have sufficient time to finalize performance measures or numeric targets, but concentrated on the Goals and Objectives that make up the performance evaluation framework. PMAG's interim product emphasizing Goals and Objectives can be carried forward all the way through the development of performance measures and targets with additional time and additional policy direction related to certain topics.

A certain degree of inconsistency or conflict exists between some of the goals and objectives. Some examples of this are: higher highway operating speeds that help to minimize travel time result in a modest loss of fuel efficiency, higher emissions of some pollutants, and perhaps even a reduction in safety. Striking the proper balance between these objectives is a matter most appropriately conducted at a policy level. With additional policy direction, time and resources, PMAG or a successor group could use the established framework to expand beyond the Goals and Objectives and complete the recommendations for Performance Measures and Targets.

Ultimately, the intent would be to use the Performance Measures and Targets to measure and assess the operation of the transportation systems and to use tools and actions to affect changes such that the desired performance is achieved. As indicated in PSC's concept, explained in Section 2.1, the Mobility Council is expected to play an important role in assessing operations and in implementing or recommending various tools and actions to affect changes. As further developed in Section 6 of this report, the tools and actions are under different authorities including the state DOTs, the transit operators and others.

The accompanying matrix of Goals and Objectives is the primary product of PMAG.

In developing the Goals and Objectives, PMAG spent considerable time proposing and discussing both Performance Measures and Targets. Again, due to time constraints, PMAG was unable to finalize these. To make certain that these efforts were not lost and to provide a good starting point for subsequent efforts, the Draft Performance Measures and Candidate Targets are included in Appendix C. As noted above, some additional policy direction may be required to fully develop these.

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PMAG Goals and Objectives

Goal Area	System Access, Mobility, and Reliability	Financial Responsibility and Asset Management	Climate, Energy Security, and Health	Safety and Security	Economic Vitality	Land Use
Goal Statement	Maximize access through efficient and reliable movement of people and goods within and through the corridor.	Ensure sufficient revenue to maintain financial solvency; maintain assets at their lowest life-cycle costs; support re-investment in programs and infrastructure; and fund operations and transportation options that extend the operational life of the facilities.	Reduce project-related energy consumption, GHG emissions, air pollution, and other environmental impacts.	Minimize the occurrence of crashes, especially those involving fatalities and serious injuries, and maximize the safety and security of project-related system users and surrounding communities.	Enhance economic vitality of the region by facilitating efficient freight / goods movement and improving multimodal access between businesses, labor markets, and job centers.	Support prevailing state and local land use goals and policies and multimodal access to jobs, services and residences.
Objectives	**Reliability**. Maintain travel time reliability of the CRC for all users (transit, auto, freight, ped/bike) with an emphasis on emergency vehicles, freight, high occupancy vehicles and transit.	**Solvency**. Generate sufficient toll revenue and transit revenue to ensure financial solvency, including satisfying obligations to bondholders.	**Air Pollutants**. Reduce emissions of project-related regional system air pollutants in the bridge influence area.	**Security**. Operate the corridor in ways that enhance the security and comfort of users of all modes, including transit riders, bicyclists, pedestrians, and motorists, as well as residents of the surrounding communities.	**Cost of Goods Movement**. Minimize cost of goods movement by balancing travel time and reliability improvements with the cost of goods / freight movement in and through the corridor.	**Balanced Land Use and Transportation**: Achieve levels and locations of planned growth of jobs and housing consistent with project access and mobility objectives, without inducing unintended growth.
	Mobility. Minimize travel delay for all users (transit, auto, freight, ped/bike) with an emphasis on emergency vehicles, freight, high occupancy vehicles and transit.	**Operations, Maintenance, and Asset Management**. Ensure sufficient funds dedicated for operations and maintenance and long-term preservation for all modes and systems, while ensuring freight movement is not disproportionately affected.	**Greenhouse Gases**. Operate the facilities in ways that help reduce project-related regional system greenhouse gas emissions consistent with state, regional and local goals.	**Safety**. Minimize crashes, especially those involving fatalities and serious injuries, across all modes.	**Access to Freight Facilities**: Improve truck access to freight facilities.	**Smart Growth**. Increase the proportion of growth in designated centers to reduce VMT and improve access.
	Mode Choice. Continually increase the proportion of trips using alternatives to driving alone.	**Transportation Options**. Ensure sufficient funds dedicated to improving and expanding access for users of transportation options including modes of travel that can extend the operational life of the facilities.	**Fuel Consumption**. Operate the facilities in ways that contribute to project-related regional system reductions in petroleum consumption.		**Access to Jobs and Markets**. Increase multimodal access and reduce travel time between: Labor force and job centers; Businesses and their markets.	**Industrial Lands**. Prevent encroachment of incompatible uses in existing and planned industrial areas.
	Demand Management. Reduce per capita VMT consistent with state, regional and local VMT and GHG reduction goals.		**Public Health Equity**. Reduce detrimental project-related regional system impacts to the public health for all populations.		**Interchange Capacity**. Protect capacity of key freight access routes.	
	System Impacts. Prevent significant adverse impacts from the corridor on related transportation systems and the surrounding communities.					
	System Equity. Improve affordable and convenient access to travel options, jobs, and housing for designated populations commensurate with improvement for the general population.					

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5. Data Needs and Collection

Performance measures are widely used and considerable data is currently collected by transportation agencies to assess and improve their operations, to inform managers and policymakers to make better decisions, or simply as a condition of federal funding. The performance measures recommended by PMAG will primarily utilize data collected by other agencies. Some of these agencies' data may be processed differently and "repackaged" to specifically address the issues and concerns about this particular project. The data may be used for monitoring and for the formulation of corrective actions.

The geographic area of coverage, the frequency of data collection and analysis, and the level of detail about some data are among the issues that will require additional investigation and recommendations. Collection of some baseline data may suggest additional data collection needs. Monitoring of results over time may also suggest changes in the content, methods, and frequency of data collection efforts.

5.1 Data from Existing Sources

Examples of some of the data currently collected by agencies and which may be useful for assessing performance measures presented in the previous section are described below.

Highway Vehicle Use Data

Both ODOT and WSDOT routinely collect traffic counts on their highway systems including counts that differentiate between vehicle types (autos and trucks by number of axles, for example). On I-5 and I-205, both agencies employ automatic traffic counts that record vehicle use continuously. Vehicle use by classification and by lane is available for these sites. These data are used to track vehicle use, including the variation by time of day, by day of week, as well as seasonal use and annual trends. These data are aggregated and analyzed in many ways, including the calculation of speeds and congestion in the corridor.

Traffic volume data is also routinely collected by the state DOTs and cities for other streets and highways under their jurisdictions. Data collection methods and the exact composition of the data vary as does the schedule upon which it is collected. Counts for most major streets and the interchange ramps are routinely collected every few years. Traffic counts at signalized intersections are also taken regularly to help optimize the signal timing.

Basic truck volumes are typically collected as part of routine traffic data collection efforts. Given the importance of freight movements in this corridor and the possibility that freight movements are already inhibited by congestion, load limits on bridges, restricted clearances or other issues, some additional data collection may be needed to establish baseline conditions and monitor system performance related to truck movements.

In all, the collection of traffic count data is reasonably routine and complete. The available data provides a reasonably complete picture of traffic operations. Agencies are expected to continue

to collect and use these data. Some of the vehicle data could readily be used to help fulfill the data needs for the recommended performance measures.

Highway Safety Data

Though the reporting requirements vary somewhat between Washington and Oregon, crash data is collected in both states and is routinely summarized by location and type. Typically, the information is summarized annually by segment, but detailed information including the specific location and details of individual crashes can be obtained and analyzed. These more detailed data are typically accessed when segment-level problems are identified.

Transit Passenger Data

Transit agencies routinely collect vast amounts of data to fulfill the reporting requirements of the Federal Transit Administration and for their own use in planning and operating their systems. For example, transit agencies have considerable detail on ridership by route and by time of day. Schedules provide information on route and system capacity.

Other transit passenger-related data gathered or assembled from various sources include information on items such as park-and-ride utilization, load factors (passenger/capacity), and other key items needed to effectively operate and manage the system. Both C-TRAN and TriMet are expected to continue to comply with reporting requirements; assembling the data to use for corridor performance measures will probably not be too burdensome.

TriMet and C-TRAN conduct an annual survey to assess public attitudes and awareness of the public transit. Topical issues are undertaken periodically as the need arises.

Alternative Modes of Transportation

Data on use of alternative modes of transportation, especially vanpools, carpools, bicycling and walking, is less comprehensive and is assembled from a variety of sources. Some of the potentially more-useful data sources are discussed below.

The City of Portland continues to expand its bicycle count program. Typically conducted by volunteers during October, the program seeks to count bicyclists during a two-hour period during the late afternoon. The number of count locations has been expanded for several consecutive years. Most counts are in the higher-use areas, but the geographic area of coverage has been expanding. The data provides some good information for comparison purposes.

Commute Trip Reduction (CTR) and Employee Commute Options (ECO) are programs of the states of Washington and Oregon, respectively. Both states require reporting on the commute trips made by employees of most large employers in the region, though certain employers are exempt and the reporting requirements of the two states are somewhat different. The data are not comprehensive since small employers are not included and it does not necessarily help determine use of alternative modes in any particular corridor or geographic area. The data is applicable only for employee commuting, not for all trip purposes.

Vanpooling information is complied by C-TRAN’s vanpool program and by Metro. Both programs actively support vanpool activity and closely monitor their participation and use. These

are potential useful data, but it currently represents a tiny segment of transportation use in the Portland-Vancouver region.

Freight-Specific Data

Freight is unique for several reasons including the fact that trucks on highways are not the only mode of transportation – rail, pipeline, air and water transport are all options for movement of some commodities and people. Intermodal transfers between modes are also accomplished at key locations near the CRC project. Another unique feature of truck freight movement in the corridor is the high proportion of traffic using the corridor that has neither an origin nor destination in the Portland-Vancouver region. Some of the more important sources of data and statistics on freight movement within the region and in the I-5 corridor include: Portland Freight Data Collection Phase II, Draft Report (2006), Oregon Transportation Plan's Freight Issues, Background Paper (2006), Washington Transportation Plan, Moving Freight, Executive Summary of Freight Report, (2005) and Strategic Freight Transportation Analysis (SFTA) Origin- Destination Freight Data (1993/1994 – 2002).

Regional Household Travel Behavior Survey

The region's MPOs undertake a household travel behavior survey every ten years. It is a comprehensive data set used to update models and is an integrated effort to calibrate all of the various travel conditions, including personal behavior tied to socio-economic characteristics, linked to traffic counts, transit counts, and bike counts. It has typically included over-sampling for LRT riders and bike riders to get more reliable behavioral information. Over-sampling of users of the I-5 and I-205 corridors could be used in a similar manner. The next regional household travel behavior survey is scheduled for 2011 which could make it especially valuable for establishing baseline conditions. Among other uses of the travel behavior survey is the calibration of the regional travel demand model from which a variety of information can be extracted, including the modeled origin-destination patterns. These model outputs can be useful for estimating trip lengths, traffic diversion, mode shift and other transportation attributes.

Non-Transportation Data

Some of the performance measures identified in this report are based on combining transportation data with data collected by and maintained by others. Air quality data, for example, are collected and monitored by Oregon's Department of Environmental Quality and Washington's Department of Ecology. Various land use data, including population and employment data, as well as the regional transportation models are assembled and maintained by the Southwest Washington RTC and by Metro. These sources will need to be tapped to calculate and analyze some of the performance measures.

The regional commodity flow data base is updated periodically but should be undertaken on a regular schedule. Regular updates would provide current commodity flow information to adjust both value and volume data for goods movement in the corridor. Timing of the updates could coincide with the release every five years of the USDOT Commodity Flow Survey of the United States. This survey is the most comprehensive freight data collection program in the country and the basis for most public and private freight data products and analyses. The next release date is January 2010. Specific freight data sources will be needed to calculate and analyze some of the performance measures for the corridor.

5.2 Data from New Sources

As described above, considerable data is routinely obtained by transportation agencies and others that can be used to help fulfill the needs related to performance measures. To analyze the I-5 corridor and the CRC project, it may be desirable to expand some of these data collection efforts and periodically undertake some special studies to gain additional data.

Toll/Revenue Data

The performance measures in the financial goal area will require certain data collected by the operating authority. Assuming tolls are collected, considerable financial information will be assembled and used by the tolling authority. Depending on whether the tolls are collected directly by a tolling authority or by contracting with a vendor, some of the data might be confidential. Tolling affords the opportunity to collect probe-based data on speeds and travel times if additional electronic "readers" are strategically placed on the facility. In addition to data on toll transactions and revenues, account data on home zip code and frequency of use (if legally available according to statute and toll account agreement) could be used to perform analysis on various factors related to travel behavior. Toll customers registered with the system offer an accessible database of respondents for user surveys.

Vehicle Occupancy Data

Data on carpool use is collected routinely on a regional basis through surveys such as the Bureau of the Census' American Community Survey (ACS). These data are only collected for commuter to work purposes and are not specific to individual corridors. Other surveys, such as the annual survey conducted by Portland's auditor's office, collect similar information. Field studies have been collected in the I-5 corridor to directly observe and tabulate vehicle occupancy of autos using I-5. These studies have the advantage of being specific to the corridor and accounting for all trip types rather than only work trips. Such surveys can be expensive and may be difficult to conduct simply because of the difficulty of correctly identifying the number of occupants of a moving vehicle. If discounts for carpooling were part of the tolling strategy, such information might be more readily available from other methods. Collection of vehicle occupancy data would probably not be needed more frequently than on an annual basis.

Travel Distance Data

Reducing the VMT is a key goal at both the state and regional level. It is likely that efforts will be made by Oregon and Washington to obtain the necessary data to assess compliance with these goals. Assessing the travel distance by users of all modes using the CRC corridor is a related, but more complex, problem. The Bureau of Census' ACS survey can provide some comparisons, but only on a regional basis. Another source of information on travel distances is the regional travel model that is calibrated from the regional household travel behavior surveys. Using the model, information can be extracted for trips that meet certain parameters, such as crossing the I-5 or I-205 bridges or that travel through the region. Certain information, such as the length of these trips, can be estimated from the model. Though not as accurate as directly obtained data, these estimates are easier to obtain and, over time, may be useful indicators of travel trends. However to use the regional model for truck travel distance information, some effort should be made to both update and refine the truck /freight element of the model and related data.

To obtain travel distances for users of all modes using the CRC project area will probably require surveys that could be moderately expensive and fairly difficult to conduct. Some efficiencies might be achieved by asking for travel distance information in connection with other surveys conducted in the region. Estimates of travel distances of vehicle trips crossing the river in the I-5 corridor multiplied by the number of vehicles counted on the bridge would at least produce a VMT estimate associated with the CRC project. The same methodology could be applied to the I-205 corridor. Travel distances by mode for the corridor probably need not be validated more frequently than every five years.

Regional Household Travel Behavior Survey

As described in Section 5.1, the region conducts a household travel behavior survey for a variety of purposes including calibration of the regional transportation model. The model can be used to estimate a variety of travel characteristics, such as travel distances, travel times, traffic diversion, and mode choice. The next survey is scheduled for 2011. Travel characteristics of the users of the I-5 and I-205 corridors may be derived from the planned survey. Over-sampling of those using these corridors might also be possible.

Special Purpose Surveys

Just as the City of Portland, TriMet and other agencies routinely use surveys to assess public awareness and satisfaction with their services, opportunities will exist for one of the state DOTs or the CRC's tolling authority to conduct surveys of the project. There are numerous methods by which statistically valid surveys can be conducted. Specialized surveys to assess awareness, attitudes and satisfaction could be undertaken individually or in connection with other surveys.

Travel Time Studies

Due to cost and manpower, travel time studies are typically conducted infrequently. As part of the data collection effort for the CRC project, travel time observations were conducted for mainline segments of I-5, I-205, and I-84. Data were used to help calibrate the traffic simulation models used to evaluate traffic operations. Some of the suggested performance measures involve origin-destination pairs that would include travel along the I-5 corridor and travel on connecting routes. Advances in travel time studies based on the use of global positioning systems (GPS) might make such studies more cost-effective and allow such studies to be undertaken on a periodic basis. In some regions, private data providers have been used to generate or extract travel time information using electronic means.

Freight Travel Time Studies

Since travel time and reliability for freight movements are important, monitoring of these attributes for trucks is important. A pilot project is currently underway in the Puget Sound region based on GPS technology. Refinements of these technologies and application of them in the Vancouver-Portland region are reasonable expectations. The method of data acquisition and reporting will evolve and the most effective truck data collection effort should be incorporated into the Mobility Council's work plan for this corridor.

Other Freight Studies

As described in Section 5.1, various studies have been conducted to gain specific information on freight issues, including things such as the type of commodity, timing, frequency, route of travel, origins and destinations, the value of the commodities and impact to business productivity. Updates of some of these prior studies, such as Commodity Flow, Freight Data Collection, Metro Truck Model Refinement and Cost of Congestion will be necessary to help to establish a more up-to-date baseline, establish targets, and track trends over time.

6. Actions and Tools That May Be Employed to Achieve Desired Results

6.1 Implementation Responsibility

There are a wide range of actions and tools that may be employed to affect the transportation use of the corridor. Some of these actions and tools are typically applied by individual agencies. The implementation responsibilities can be described in the following hierarchy:

Level 1 – These consist of the actions under the direct authority of the respective state transportation commissions or the state DOT for highway elements. Under state law, the Washington and Oregon Transportation Commissions have authority for tolls in their respective states. The state DOTs are responsible for operational items such as ramp meter rates, incident response practices, patrolling, maintenance and restriping, etc.

Level 2 – These consist of actions under the jurisdiction of other partner agencies such as the transit operator for operation of the light rail, buses, or park-and-ride facilities or the cities that control various arterial streets. The transit agencies have authority for fares, frequency of service, geographical coverage of routes, the operation of park-and-ride facilities, etc. Besides operating their local street systems, including signal timing, maintenance, on-street parking regulations, etc, local agencies are primarily responsible for transportation demand management programs and related issues.

Level 3 – Another set of actions and tools, especially those related to development, land use, and zoning, are under the jurisdiction of agencies with land use authority under state law, principally the cities and counties.

It is possible that the Mobility Council could have an ongoing role that would include annual recommendations relating to the operating agencies related to tolling, travel and auxiliary lane use, transit policies, and transportation demand management (TDM) strategies.

6.2 Categories of Tools

Tools and actions may have multiple uses and consequences. Many tools may be aimed at a certain aspect of corridor operations, such as peak hour, peak direction of travel on I-5. In applying a tool, such as increasing peak period tolls, to reduce that peak demand, it is important to consider the availability of alternatives, such as capacity of the light rail system, capacity for highway traffic during the off-peak hours, and available capacity of alternative routes, such as I-205. In addition, it may be important to match the primary tool, such as peak period tolls in this example, with ancillary tools, such as a marketing effort to inform the users of the available options. Rather than implementing a single tool aimed achieving a specific result, it may be appropriate to implement combinations of tools that are complementary.

Some tools are applied to maximize the operational efficiency of the highway system. These Transportation System Management (TSM) tools reduce delays, minimize variations in vehicle speed, increase reliability, and increase safety. TSM applies technology, such as real-time traffic monitoring, signals and communications equipment, and emergency response. These tools may be used to meet key performance measures in the System Access, Mobility, and Reliability Goal and the Safety and Security Goal.

Traffic is a key component in most of the performance measures discussed in Section 4. In general, growth in traffic volumes could result in failure to achieve the desired results in the System Access, Mobility, and Reliability Goal; the Environment Quality and Climate Goal; the Safety and Security Goal; and some of the performance measures in the Land Use and Economic Vitality goal areas. As a result, many of these tools are intended to affect the number of vehicles using the facility. In many cases, the tools are designed to allow people to satisfy their travel needs at different times or using different modes. The tools that may be employed to affect vehicle use mostly fall under categories of Transportation Demand Management (TDM), transit, and bicycle/pedestrian.

Because they can have such a huge impact on facility use, tolls and pricing strategies deserve special attention. Tolling is the financial tool, while variable pricing is a mechanism to achieve demand management objectives by time of day, by lane, or by user. The toll rate and overall pricing strategy can produce profound effects, including diversion to alternative routes, changes in mode choice, and changes to other times of the day. Tolls deserve special attention because their principal use is to repay the costs associated with constructing and maintaining the facility.

Land use tools are the final category. There is a definite relationship between land uses, the travel demand generated by the land uses and the resulting performance of the transportation system. Land use changes and the requirements associated with developments can have a long-lasting impact on transportation needs of the area. While access patterns provided by the transportation system can influence land use patterns, this occurs only within the context of land use regulations established and administered by local governments.

6.3 Transportation System Management (TSM) Actions and Tools

TSM is defined as the measures and actions used to increase the efficiency of operations of the transportation system, especially the street and highway network, including signals and signal systems. TSM measures are intended to increase efficiency of operation and to respond to the traffic, making use of the roads at the time. TSM measures help the transportation operations agencies respond to scheduled and unscheduled disruptions and demands.

TSM involves a certain amount of equipment, such as signals and communications equipment, and the technology to monitor traffic and make adjustments to their operations on a real-time basis. TSM also involves systems and equipment used to respond to roadway incidents, so as to minimize any unplanned loss of roadway capacity and traveler information systems that can help travelers make adjustments to their planned route.

TSM measures have a short-term orientation, as opposed to TDM, which seeks to affect a long-term change in traveler behavior patterns. TSM measures are designed to allow the transportation operations agencies to respond to observed conditions in real-time, thus allowing the system to

operate at near optimal capacity during as much of the day or hour as possible. TSM is almost exclusively in the domain of transportation agencies' operations personnel. Many TSM measures, such as adjustments in signal timing, may go unnoticed by travelers.

Common elements of TSM programs include the following:

- System monitoring and traveler information systems (e.g., web-based information systems, variable message signs, etc.),
- Facility management systems (e.g., optimized signal systems, ramp meters, signal priority for special users, such as transit, special purpose lanes such as those for HOVs or operated as HOT lanes), and
- Incident management systems (e.g., incident response and recovery teams).

Most of these common TSM programs are currently used in the I-5 corridor and are expected to be incorporated into the final design of the CRC project. Ramp metering and preferential lanes are worth some additional discussion because they could be used in connection with other tools and actions to affect use of I-5.

Ramp Meters – Ramp meters are used on the on-ramps to freeways and other limited access highways for two different purposes. First, ramp meters can discourage drivers from selecting the highway, rather than local roads, for shorter trips, thus preserving the capacity of the highway for longer, regional travel. This may not be relevant when considering I-205 and I-5 to cross the river, but may be a consideration when assessing whether motorists use I-5 or MLK Boulevard for trips within North Portland. Second, when traffic is heavy on both the mainline and the ramp, ramp metering can limit the amount of ramp traffic to the volume that can comfortably merge with traffic on the mainline. By adjusting the metering rate on the ramp, the combination of mainline and ramp volumes can be kept below the critical value at which a breakdown in traffic flow occurs. Its benefits can be reaped when the traffic flows are neither too light (in which case metering is not needed) nor too high (in which breakdown will happen anyway).

By metering the flow rate of traffic on the ramps, ramp meters increase travel times for traffic entering the highway, but keep travel speeds higher for longer distance, mainline traffic. In its simplest application, ramp meters set minimum intervals between vehicles entering the highway from the ramp with a fixed-time signal. More sophisticated ramp metering adjusts the rate of entering vehicles in response to the actual, real-time flow on the highway and the number of vehicles waiting to enter on the on-ramp.

Since ramp meters are used only on highway entry ramps, ramp meters are successful when deployed throughout the corridor system (over longer stretches of freeways). Ramp meters have a greater impact on the highway mainline and downstream interchanges than they have at the interchange at which they are installed. Ramp meters rely on sensors that are installed in the lanes of the highway to measure traffic volumes. The data used to program the ramp meters are also used to create real-time traveler information.

ODOT has installed ramp meters along each on-ramp to I-5 within the I-5 study area and WSDOT maintains one ramp meter at the SR 14 on-ramp to southbound I-5. Ramp meters are

used during peak hours and meter traffic in the peak direction only. During off-peak hours, ramp meters are turned off.

Theoretically, ramp meter timing could be adjusted specifically to impose a time penalty on those using the ramp and the highway, thus encouraging diversion to alternative routes, such as parallel facilities. In this case, ramp metering might appropriately be described as a TDM measure since it would shift trips to a different corridor, different time or different mode. The effectiveness of this strategy could depend upon the availability of alternative routes and their level of congestion. Reducing the number of vehicles using a ramp by adjusting timing could result in giving preference to longer-distance trips at the expense of shorter trips.

Management of Preferential Lanes – Once a decision has been made to provide lanes for preferential or exclusive use, an operating agency can set operating parameters related to the hours of operation and the allowable users. Common operating parameters include restricting the lane usage to transit vehicles, vanpools, and carpools with specific occupancy (both 2+ and 3+ occupant standards are used in different cities). In some cities, vehicles with a single occupant can also enter the lane by paying a toll. In other cases, carpools with three or more occupants are not charged a toll, but those with two occupants pay a toll, but single occupant vehicles are never allowed. Hybrid vehicles with a single occupant are also eligible to use carpool lanes in some areas.

In the Portland area, there is one example of a managed lane. ODOT utilizes a northbound managed lane for HOV users during the afternoon/evening peak period. Additionally, ODOT utilizes a preferential on-ramp lane at the Victory Boulevard on-ramp to northbound I-5 for exclusive use by buses. This lane allows buses to bypass other vehicles waiting at the on-ramp meter and provides a travel time savings and reliability for transit.

Managed lanes have been studied for the I-5 corridor including an assessment associated with the Delta Park project now underway for southbound I-5 in Oregon. A pilot project with an HOV lane was tested by WSDOT but removed after the test period. An analysis conducted of a managed lane in connection with the CRC project revealed several specific issues including operational problems beyond the project limits. One of the unique challenges is the high proportion of traffic crossing the Columbia River, but which travels less than five miles on I-5. Even if a managed lane were provided, traffic eligible to use it that entered near the bridge, such as from SR 14, might be unable to merge across the general purpose lanes to gain access to it. A managed lane along I-5 might still have potential if implemented as part of a regional program.

6.4 Transportation Demand Management (TDM) Actions and Tools

TDM is defined as an action or set of actions intended to influence the intensity, timing, and spatial distribution of transportation demand for the purpose of reducing the impact of traffic or enhancing mobility options.

TDM seeks to accomplish the following:

- Increase the use of commute alternatives, essentially using modes other than an SOV,
- Spread the timing of travel to less-congested periods,
- Reduce the need to travel, and

- Shift the routing of vehicles including trucks and single occupant vehicles to less-congested facilities or systems.

This definition addresses mode choice, time choice, location choice, and route choice.

This definition does not include facilities (e.g., transit buses or bike lanes), but rather the means by which commuters and other transportation system users are encouraged or induced to use them. Having viable alternative mode choices (which for transit, bicycling, and pedestrians requires facilities) is a prerequisite to having a useful TDM program. Facilities that allow choice by transportation system users are planned as part of the CRC project.

A variety of TDM programs and measures are currently in use in the Portland-Vancouver area. Current TDM programs in the Portland-Vancouver region can be categorized according to four basic strategies:

- Programs to improve public awareness of transportation choices.
- Programs to improve access to or availability of alternative transportation choices.
- Incentives and disincentives that cause changes in transportation choices by individuals.
- Institutional and organization approaches to promote TDM.

Public awareness of TDM and alternatives to driving are being achieved regionally by ODOT, Metro, TriMet, C-TRAN, City of Vancouver, and Clark County through two primary features:

- Broad public outreach via mainstream (newspaper, TV, radio, billboard, bus ads, etc.) and specialized advertising (events, etc.), and
- Individualized marketing campaigns aimed at informing segments of the public of mode choices, availability, and potential incentives to utilize non-auto travel.

Public awareness campaigns have been used in the region and have been proven to be quite effective in connection with the implementation of new services such as the inauguration of a new LRT route. These campaigns help teach potential users how to take advantage of the new service. This would be very suitably tied to the opening of a new CRC bridge/toll/LRT system.

Current public awareness efforts that could be expanded or supplemented include SmartTrips Portland, Clarkcommute.org, Smart Commuter Campaign, Southbound Solutions, and Drive Less Save More.

Programs to improve access to or availability of alternative transportation choices include transit, park-and-ride facilities, carpooling, and vanpooling. The transit improvements associated with the CRC project are well known – extension of the MAX line to Hayden Island, Downtown Vancouver, and Clark College. Three major park-and-ride facilities are planned in Vancouver as part of the CRC project. Vanpooling and carpooling could be actively promoted as part of a solution to reduce vehicle traffic along I-5.

TDM can also include incentives and disincentives that affect travel behavior by influencing, either positively or negatively, the cost of travel or the time associated with travel. Actions that decrease either the cost or time required for travel are incentives while those that increase the cost or travel time are disincentives. Seeking to shift travel to non-SOV modes can involve

incentives to increase their use and corresponding disincentives that make driving alone the less attractive. Several incentives and disincentives are found in the Portland-Vancouver region and affect transportation choices.

One incentive program example is subsidizing vanpool use by providing vehicles and a partial subsidy for operating expenses. Other incentives, such as offered through the Portland SmartTrips program and the Clark County Commuter program, include prizes or cash for those who utilize alternative travel modes.

Many incentives are employer-based. In response to or inspired by the Washington CTR law and Oregon ECO rules, employers throughout the region offer incentives to influence their employees' travel choices. Under both the Washington CTR and Oregon ECO programs, employers have considerable flexibility to tailor programs to their needs, their employees' needs, and the availability of alternative modes of travel. Typical employer-sponsored TDM features include:

- Flexible work schedules;
- Working from home (telecommuting);
- Subsidized, or even free, transit passes;
- Ride matching and preferential parking for carpools and vanpools;
- Guaranteed ride home;
- Parking cash out (giving those who do not occupy a parking space the equivalent in cash to use to subsidize their mode of choice);
- Incentives to walk and bike;
- Secured bicycle parking; and
- Changing rooms/showers.

Common features of the employer-based TDM programs are the use of incentives that seek to make non-SOV modes more competitive with the drive-alone mode for travel to and from the workplace.

Improved institutional and organizational approaches are also used to improve the effectiveness of TDM programs. Among them are the establishment of transportation management associations (TMAs), of which there are several in Portland, or Vancouver's Growth and Transportation Efficiency Center (GTEC). These organizations seek to promote TDM programs in specific areas often by working with employers and employees.

6.5 Bicycling and Walking

The CRC seeks to replace the current, substandard facilities with new, modern facilities that are fully compliant with the Americans with Disabilities Act (ADA). As part of the CRC project, connections to both the Vancouver and Portland systems will be improved. Some of the existing connections are circuitous and confusing.

Providing a superior facility can be expected to significantly increase the amount of use it receives, but promotional efforts can always help. Safety and security are well-known issues on bicycle/pedestrian facilities and some of the performance measures directly address this issue. A high level of maintenance and security provisions will be needed. Among the maintenance and security issues identified by the CRC's Pedestrian and Bicycle Advisory Committee (PBAC) were the commitment of adequate funding, opportunities for active programming of the space, visible and regular on-site monitoring by law enforcement or security staff, and provision of security cameras, call boxes, signing and lighting. PBAC also recommended comparison against measurable metrics and assessments of user satisfaction relating to maintenance and security.

6.6 Tolling and Pricing

As explained above, tolling is the financial tool, while variable pricing is a mechanism to achieve demand management objectives by time of day, by lane, or by user. If financial requirements must be met, then the two must be balanced. A tolling authority cannot simply raise the price to meet financial objectives without understanding and accounting for the behavioral aspects of the users' "willingness to pay" and the ramifications that pricing can create relative to other routes and modes. Balancing these is influenced by many project-specific factors. Peak period pricing is aimed at the periods when traffic volumes lead to congestion and delay with pricing set to incent use of other times, routes, modes and destinations.

Authority for tolling rests with the Washington Transportation Commission and the Oregon Transportation Commission. Washington law makes provisions for an advisory group that might be fulfilled by the Mobility Council.

The current assumption relative to tolling of the CRC project is that tolling would be performed electronically and that it would vary by time of day. Various tolling scenarios are being tested, but none has yet been recommended. The CRC's Tolling Study Committee's members are the Chair of the Washington Transportation Commission; the Chair of the Oregon Transportation Commission; the Secretary of the Washington Department of Transportation; and the Director of the Oregon Department of Transportation. The Tolling Study Committee is on a similar schedule to that of PMAG with a report expected early in 2010.

In general, it has been found that higher tolls decrease use of a facility and increase diversion to alternative routes and modes. Tolling authorities must be careful when setting toll rates to achieve sufficient revenues to meet their bond obligations and operational needs.

Pricing and discounts have potential application to change the behavior patterns and use of the facility and could affect demand in the corridor. The implications on the tolling authority's revenue must be considered in connection with pricing.

6.7 Land Use Actions

Tools related to land use are potentially the most powerful, but also may take a long time to realize results. The connection between land use and transportation are well known. The transportation impact of a particular development at a particular site can be fairly readily calculated. The geographic relationship between trip origins and destinations also has a profound effect on the likelihood of travel between them as well as the choice of mode used for the trips.

The Portland-Vancouver region has already embraced the smart growth concept in regional planning. Walkable communities, green streets, transit-oriented development are common themes in the region. The CRC project, including the elements related to roadway improvements, light rail and bus service expansion and active demand management through tolling and system management, is consistent and intended to reinforce the region's land use goals.

A number of the performance measures identified by PMAG seek to track the land use activities to monitor whether the desirable attributes are being implemented as planned and to determine if any unintended consequences begin to develop. The emphasis on higher densities in areas well served by transit as envisioned in plans needs to be realized. Depending upon progress made over the coming years, various adjustments may be needed or provisions strengthened. Most of these would fall under the category of land use actions that are likely within the jurisdiction of Metro and the cities and counties, but coordination with the respective regional planning agencies and states could be required.

Because of the importance of the land use and transportation relationship, monitoring development, housing, and employment trends and making adjustments could be critical to the region. Among the most important factors are:

- The rate of housing development in relation to jobs in Clark County,
- The capture rate of housing with the Metro urban growth boundary,
- The proportion of growth that occurs in mixed developments that help minimize travel needs,
- The amount of growth in areas well served by public transit, and
- The amount of growth that occurs near interchanges where capacity is needed for freight movements.

Careful coordination among the region's planning agencies, cities, and counties will be needed. Land use actions implemented in concert can help avoid impacts detrimental to the regions transportation system and the CRC project.

7. Future Steps in Development and Application of Performance Measures and Targets

As indicated previously in this report, this is an interim product on performance measures produced by PMAG. It is a framework with complete Goals and Objectives that can be used as a basis for refining specific Performance Measures and defining Targets. The Performance Measures and Targets can be used to assess and evaluate the performance of the project and its effect on the region's transportation system. Ultimately, the Performance Measures and Targets can be used to manage the CRC facilities and the broader system.

Some of the future actions that will be needed to fully implement the remainder of the project are discussed below. The tasks may not be all inclusive and may be conducted in a different order than discussed below. The tasks are grouped in some general categories, though there is overlap among them.

Immediate Need for Policy Direction

- Accepting, with modification as needed, PMAG's Goals and Objectives as presented in this Report.
- Providing clearer policy direction and guidance to PMAG.

Overall Policy Direction

- Better defining the Mobility Council schedule, duties, authority, responsibilities, membership, rules, charter, etc.
- Identifying whether the Mobility Council can serve as citizen advisory committee for toll facilities as defined by RCW 47.46.090, or, what the relationship should be between the Mobility Council and this citizen toll advisory committee.

Establishment of PMAG or a Successor Technical Body

- Providing guidance for PMAG or a successor body with clearer identification of responsibilities, authority, funding, schedule, expectations and reporting requirements.
- Finalizing the Performance Measures, including categorizing them by importance (e.g. critical, potentially valuable, important for managing the system, and dropped for reasons of complexity or difficulty of administration).
- Establishing methodologies and responsibilities for collecting new data needed to support the Performance Measures and Targets.
- Establishing appropriate baseline values for both existing and new Performance Measures.

- Establishing Targets for the selected Performance Measures, including details such as frequency of comparisons and allowable deviation from established values.

Policy Direction Related to Implementation and Use of Performance Measures

- Assigning responsibilities and authorities among the partner agencies for collecting and analyzing data and comparing them with Performance Measures and Targets.
- Establishing more formal relationships among the Mobility Council and partner agencies for evaluating and implementing tools and actions to manage the system.

APPENDIX A

Columbia Crossing Mobility Council
- Concept –

Project Sponsors Council – March 6, 2009

Background/Preamble:

The Columbia River Crossing Project is a long term, comprehensive, multi-modal transportation project that will bring significant economic and environmental benefits and improve the quality of life in the bi-state region. The I-5 corridor is nationally significant and the most important trade and commerce corridor on the entire West Coast. This project addresses one of the most significant chokepoints in this corridor.

The accomplishments achieved to date have been primarily due to the cooperation of all the project partners at the state, local and regional levels. That cooperation was founded in a Locally Preferred Alternative (LPA) in July 2008 that was unanimously supported by all partner agencies. The LPA achieved consensus on the following higher level outcomes:

- The project will build a replacement bridge.
- The project will incorporate light rail transit as the high capacity transit mode.
- The light rail transit extension will terminate at Clark College in Vancouver.
- The project will provide a range of options and significant improvements for those wishing to use alternate modes of travel within the corridor (light rail transit, bus, shared ride, bicycle and pedestrian).

Several other areas of agreement are apparent as we move forward through the final phase of the Environmental Impact Statement (EIS) and into design:

- The replacement bridge will be constructed with adequate width to accommodate six lanes in each direction to provide for safe operations between interchanges and efficient movement of people and goods.
- This project is consistent with the regional plans that call for three through lanes in each direction on I-5 within the metropolitan area.
- The finance plan will consist, in part, of tolling options to not only repay debt and ongoing operations and maintenance, but also to help as a tool to manage the travel performance of the Columbia River crossings.
- The Project Sponsors Council will begin evaluation of issues related to tolling at its June 2009 meeting and commence a process for public dialogue and discussion about tolling.
- The project will increase the safety in the corridor by improving the interchanges within the project area.
- The project will create predictable and reliable trip durations for freight and other high-priority trips moving through and within the corridor.
- The project will help to maintain regional trips on the facility, rather than spilling over to local collectors and arterials due to congestion.

- At its June 2009 meeting, the Project Sponsors Council will endorse membership of a technical group to draft performance measures.
- By January 2010, the afore-mentioned group will present recommendations to the Project Sponsors Council.

Columbia Crossing Mobility Council
The Project Sponsors Council supports creation of a local advisory Mobility Council to advise the state departments of transportation (DOTs) and transit districts on the optimal long-term performance of the Columbia River crossings. It is through such a partnership that the federal, state, regional and local needs will be achieved. The Project Sponsors Council supports practical and measurable performance standards to maintain long term system management.

This complex project has significant areas of agreement among the local agencies and stakeholders. The areas of agreement as noted above will serve as the starting point of a Council to advise the DOTs and transit agencies on ways to not only achieve the goals of the local communities, but also preserve the integrity and function of this yet to be constructed national asset.

Purpose:
The purpose of this Mobility Council is to provide recommendations to the DOTs and transit agencies on ways to actively manage mobility for all modes of transportation on the Columbia River crossings and their adjoining city streets and highways. This Mobility Council will help maximize the long-term benefits of the new multi-modal crossing for all users and affected stakeholders in an equitable manner by recommending the implementation of the agreed upon goals.

Partners:
Oregon Department of Transportation (ODOT), Washington Department of Transportation (WSDOT), City of Portland, Oregon, City of Vancouver, Washington, TriMet, C-TRAN, Metro, RTC, Port of Portland, Port of Vancouver

Council Structure:
Along with a Chair appointed jointly by the governors of the states of Oregon and Washington, each Partner appoints a non-elected citizen representative to serve a three-year term on the Columbia Crossing Mobility Council.

Process:
The DOTs will provide staff to the Mobility Council which will hold its first meeting at such time as the CRC Project Sponsors Council deems it necessary.

Each year the Mobility Council will recommend a Columbia Crossing Mobility Operations Plan for consideration by ODOT and WSDOT, and TriMet and C-TRAN, and others, as applicable.

The Mobility Council will consult with other local, state and federal agencies relevant to issues being considered.

The Mobility Council's annual recommendations may include, but are not limited to, tools such as:

- Toll rate structures, provided they are consistent with toll bond covenants and do not negatively impact the ability to pay bonds or meet other project related financial needs with toll revenues (including operations and maintenance)
- Travel and auxiliary lane uses and access
- Applicable transit policies
- Transportation demand management (TDM) strategies

The Plan will be forwarded from the Mobility Council to the DOTs and Transit Agencies. At that point, ODOT and WSDOT, and C-TRAN and TriMet, and others, as applicable, will either accept the Plan as is, or reject it with comments.

a. The Oregon and Washington DOT commissions or CEOs, or transit agency boards or directors as applicable will consider the Plan before taking action.
b. When accepted, the Plan will be implemented by the DOTs, Transit Agencies and others as applicable.
c. If applicable sections of the Plan are rejected by either DOT or Transit Agency, the Plan will be sent back to the Mobility Council with comments and a request to amend the Plan. The Mobility Council will resubmit a revised Plan for approval by ODOT and WSDOT, or C-TRAN and TriMet, or others, as applicable.
d. If agreement on a revised Plan cannot be reached within 90 days, the ODOT and WSDOT Transportation Commission Chairs, or their CEOs, or the Chairs of C-TRAN and TriMet, or their delegates, will convene with the Chair of the Mobility Council to resolve any differences and complete the annual Columbia Crossing Mobility Operations Plan.
e. If agreement cannot be reached as outlined in (d) above, the DOTs and transit agencies and others, as applicable, may act without recommendation in accordance with their best judgment on how to achieve the agreed upon performance goals.
f. When toll rate decisions need to be adjusted at a faster rate than this process identifies in order to satisfy bond needs (including operations and maintenance), the DOTs are entitled to act on those decisions while giving the greatest possible consideration to the performance goals of the project.
g. The Columbia Crossing Mobility Council may recommend extending this process to pertinent operations of other Partners.

APPENDIX B

Performance Measurement Technical Working Group

Discussion Draft 5/1/09

Background

At their March 2009 meeting, the Project Sponsors Council (PSC) agreed that a Performance Measures Technical Working Group (PMTWG) will convene prior to the formation of the CRC Mobility Council. The PMTWG will meet between June 2009 and January 2010.

Issues of importance to the Project Sponsors Council that prompted their request for transportation performance measures include:

- Protect investments in the corridor
- Maximize system capacity and efficiency of I-5 in the Portland/Vancouver area
- Reduce transportation related greenhouse gas emissions
- Minimize induced demand and growth

Purpose

The Performance Measures Technical Working Group will be responsible for:

- Developing reasonable and measureable transportation performance measures to ensure optimal long-term performance and management of the Columbia River crossing, including;
  - Safety in the corridor
  - Effective management of Interstate 5 and related arterials and highways
  - Predictable and reliable trips for the multi-modal transportation system
- Draft recommendations will be provided by the PMTWG to the CRC Project Sponsors Council by November 2009. Final report will be provided to the PSC by January 2010

Members

The member list for this group will be approved by the Project Sponsors Council and will include technically proficient staff from the following agencies:

- ODOT
- WSDOT
- CRC
- Metro
- RTC
- City of Portland
- City of Vancouver
- TriMet
- C-TRAN
- Port of Portland
- Port of Vancouver
- And national experts

The group will be facilitated by a consultant with knowledge of performance measures and experience facilitating technical conversations. The facilitator will not be considered a member of the group.

Meetings and Schedule

The Working Group will be formed in June 2009 and sunset in January 2010. Meetings will take place at the CRC project office or other agency locations. Frequent meetings are anticipated in order to meet the scheduled outlined above. Exact meeting dates will be determined by the PMTWG.

APPENDIX C
Draft Performance Measures and Targets

This appendix provides additional background about Performance Measures and Targets as discussed in PMAG meetings. As indicated elsewhere in this report, additional work is needed to identify and select appropriate Performance Measures and Targets. One of the key issues relates to the geographic areas or locations where they apply.

As a multi-modal project and because of its location, the CRC project will have impacts that vary by geography. Some impacts occur only on or adjacent to the corridor with almost no impact at more distant locations. Other impacts of the project could be regional in scope with relatively little variation by location. As a result, performance measures must be customized to the specific issue. Because of these variations, there is not a uniform geographic area for all performance measures. Two examples, one with a local focus and one with a wider geographic orientation, are discussed below.

Safety impacts of the project are probably among those with the least observable impact outside the project area. Key elements of the project include replacing the existing lift span bridge, adding lanes to reduce congestion, improving ramp geometry and adding safety shoulders wide enough for disabled vehicles to be removed from the travel lanes. Each of these elements is expected to improve safety in the corridor, a corridor in which the crash rate is far higher than similar facilities. There is some possibility that traffic spillover or diversion resulting from the project could result in safety-related issues in other locations, but the emphasis on safety issues can focus within the project limits – a relatively confined geographic area.

Vehicle miles of travel (VMT) is a performance measure that requires a wider geographic area of assessment. Both the states of Washington and Oregon have adopted goals of reducing per capita VMT. In addition, some diversion of traffic to alternative routes, such as I-205, is anticipated, especially if tolling is implemented in the I-5 corridor. In addition to reporting on VMT of trips crossing the bridge, it may also be important to report VMT for the regional highway system and the entire street network in the region.

The issue of location and geographic coverage will need to be considered in subsequent identification and selection of Performance Measures and Targets.

GOAL AREA: SYSTEM ACCESS, MOBILITY, AND RELIABILITY

The Performance Measures in this goal area need to include a wide variety of indicators focusing on users (people) and the vehicles (all modes). They include performance statistics, many of which are related to time. Finally, they include customer satisfaction statistics. Many of the performance measures will focus on the bridge and the I-5 corridor, but others will need to address a much wider geographic area because of the system-wide and regional impacts that may result from the construction of the project and the manner in which the facilities are operated.

Targets will have to be refined based on a more accurate determination of the baseline operations and on policy direction.

Draft Performance Measures:

- Corridor User Statistics
  - Person trips by mode, location, by time of day, and by season (mode split)
  - Trips eliminated or diverted to other routes
- Modal Operations Statistics (for all modes)
  - Vehicle miles traveled
  - Trip volume (by classification, including trucks) by time of day and by location
  - Vehicle travel time and speed by time of day and location (including variability)
  - Vehicle and person volume in other corridors, especially related to traffic diversion
- Observed System Performance Statistics (for all modes)
  - Duration of periods of congestion (highway and transit corridors)
  - Travel time reliability (buffer index, travel time index or other measures indicating variability in travel time)
  - Recurring delay (for all modes, including freight)
  - Non-Recurring, incident-induced delays (for all modes, including freight)
  - Transit schedule adherence, load factors, and related passenger measures
  - Transit vehicle and Park & Ride occupancy.
  - Interchange delay and length of queue during peak and non-peak periods
- Customer Satisfaction Statistics (for all modes)
  - Satisfaction with cost (toll, fares, etc) relative to system performance (reliability, convenience and frequency of transit service), level of maintenance (lighting, sweeping), safety and convenience (for users of all modes)
- Equity Measures
  - Cost, safety and travel time for all populations to access travel options, jobs residences, and services
  - Population within half mile walk of transit stop
  - The share of the region populations that live within 20 minutes of essential destinations by bicycle and public transit
  - Vehicle and transit travel times between residential areas and selected destinations (including employment, education and commercial areas).

Candidate Targets:

- Achieve average operating speeds on the I-5 mainline of approximately 45 mph at least 90 percent of the time during peak periods.
- Achieve average operating speeds on the I-5 mainline of approximately 45 mph at least 99 percent of the time during non-peak periods.
- Operate public transit systems and highway systems such that transit is competitive with auto travel when considering travel time, expenses, and impacts of each mode between key destinations.
- Maintain an upward trend in the percentage of non-SOVs used in the corridor.
- Achieve a corridor VMT trend (excluding freight) that rises more slowly (or falls more rapidly) than that of the region as a whole.
- Achieve traffic volume changes that are slower than regional population growth.
- Avoid diversions of traffic to alternative routes that increase traffic to levels that cause failure as defined by applicable mobility standards as defined by the responsible jurisdiction.
- Maintain trend toward 18,000 daily transit riders by year 2030.
- Maintain trend toward having at least 2,000 daily bicycle and pedestrian users by 2030.
- Freight movement reliability equal to that of the general traffic in the corridor.
- Achieving non-SOV mode share across the Columbia River that tracks consistent with mode share across the Willamette River.
- Cost, safety and travel time for vulnerable populations to access travel options, jobs residences, and services that are comparable to the population of the region as a whole
- Percent of vulnerable population within half mile walk of transit stop in BIA
- The share of the region's low-income, minority, senior and disabled populations that live within 20 minutes of essential destinations by bicycle and public transit
- Vehicle and transit travel times between representative low-income or minority areas and selected destinations (including employment, education and commercial areas) that are comparable with the region as a whole.

GOAL AREA: FINANCIAL RESPONSIBILITY AND ASSET MANAGEMENT

The Performance Measures in this goal area relate to the expected operation of the highway as a toll facility, the operation of the transit system, and the support for transportation options. Some of the Performance Measures and Targets will be under the authority of the agencies with tolling authority for the highway and some will be the responsibility of the transit operators.

Draft Performance Measures:

- Toll revenues by category and discounts, if applicable
- Debt coverage

- Expenditures for administration and collections
- Expenditures for maintenance
- All modal systems and elements maintained and/or operated at good or better conditions
- Cost of transit, compared with toll

Candidate Targets:
- Sufficient revenues to meet bond obligations; administrative and collection expenses; maintenance needs for all modes; and reserves.
- Sufficient revenues to allocate to programs that promote Transportation Options that help extend the operational life of the facility.
- Balance of revenues and expenditures in compliance with federal and state laws
- Meet applicable asset management, operations, maintenance, and related financial standards of owners and service providers

GOAL AREA: CLIMATE, ENERGY SECURITY AND HEALTH

This goal area covers interrelated issues related primarily to the use of vehicles with internal combustion engines. The issue arises from their release of pollutants, consumption of petroleum products, and the resulting public health concerns. These issues are being addressed on many fronts with goals and policies on local, region, state, national, and in some cases, international arenas.

Draft Performance Measures:
- Annual calculation of air quality emissions from measuring and monitoring in adjacent neighborhoods.
- Annual calculation of GHG-related emissions from traffic counts and modeling based on VMT, speed, speed variability, and fleet composition
- Annual calculation of fuel consumption from modeling based on vehicle counts, VMT, speed, delay, and fleet composition
- Environmental justice: specific measures to be determined

Candidate Targets:
- Maintain a downward trend in emissions of air pollutants resulting from traffic in the I-5 and I-205 corridors.
- Maintain an upward trend of bicycle and pedestrian use of the bridge.
- Maintain a downward trend of GHG emissions leading toward meeting the GHG targets established in state, local and regional goals.
- Maintain a trend of slower growth of petroleum consumption in the BIA than in the region as a whole.
- Meet applicable state and regional goals, standards, or laws as applicable.
- Aim for a downward trend for petroleum and GHG or at least better than the region as a whole or population growth.

GOAL AREA: SAFETY AND SECURITY

This goal area relates to both the related areas of safety and security for both users of the facility and those in the affected communities nearby.

Draft Performance Measures:

- Highway crash statistics by segment, type, location, and severity (number, rate, high-accident locations; truck-related crashes by type as a subset; the CRC corridor and key diversion routes)
- Number and severity of transit incidents
- Number and severity of bike/ped crime and crash incidents
- Number of accidents and accident rate for each mode
- Number of call box alarms on the bicycle/pedestrian level of the facility

Candidate Targets:

- Highway crash that are better than the average for urban freeways in the respective states.
- Transit incidents at better than system-wide averages.
- Better performance than system-wide averages for each provider and each individual mode

GOAL AREA: ECONOMIC VITALITY

This goal area focuses on various indicators related to key elements of the regions economy, including the industrial sector and the transportation sector, which is a particularly important sector in the Portland-Vancouver region. This goal area recognizes the relationship between economic vitality and the need to account for the transportation costs (monetary and time) associated with the movement of goods and people.

Draft Performance Measures:

- Freight travel time and reliability for through movements and those on-off within BIA
- The value and volume of freight moving across the bridge annually.
- The number of truck trip turns from Port terminals to I-5 (use Road link # of turns daily)
- Travel time on four indicator routes:
  - Marine Drive
  - Columbia Boulevard
  - Mill Plain
  - 4th Plain
- Travel time between key employment centers to outside of region and within the region between the following origin-destination pairs:
  - Wash Co. to PDX
  - Downtown PDX – north Portland
  - Wilsonville to Columbia Corridor
  - Clark County to Columbia Corridor
  - East Clark County to Port of Vancouver

Candidate Targets:

- To be developed after completion of baseline data

GOAL AREA: LAND USE

This goal area focuses on land use because of the interrelationship between land use and transportation. Many of the Draft Performance Measures are intended to help assess whether the land use plans and policies intended to reduce the use of the transportation system (particularly the regional highway system) are proving effective in achieving their goals. Because so many land uses are already well-established, the effect of changes will need to be monitored long-term.

Draft Performance Measures:

- Growth of jobs and housing in each urban county.
- Growth of jobs or output in Vancouver and Portland industrial areas.
- Growth in areas of each urban county and key cities targeted for increased density.
- Growth of non-freight uses around interchanges intended primarily for freight access to I-5.
- The jobs/housing ratio in each urban county.
- Metro's housing capture rate relative to that of each urban county.
- Acres of industrial land as a percentage of industrial designated in 2010
- Proportion of residential and job growth in transit-supported areas
  - On each side of the river
  - Across the BIA
- Jobs/housing ratio
  - On each side of the river
  - Across the BIA
  - Adherence to prevailing plans
  - Near freight-heavy interchanges (break down jobs by sector)
- Mode choice and trip distance trends
- Workforce access to key industrial and other job centers within the BIA

Candidate Targets:

- Values to be tracked relative to regional and local land use plans
- To be developed after completion of baseline data