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Metro | *Agenda*

Meeting: Transportation Policy Alternatives Committee (TPAC)

Date: Friday, January 9, 2009

Time: 9:30 a.m. to 12 p.m.

Place: Room 370A/B

9:30 AM	1.		Call to Order and Declaration of a Quorum	**Robin McArthur, Chair**
9:30 AM	2.		Comments from the Chair and Committee Members	**Robin McArthur, Chair**
9:35 AM	3.		Citizen Communications to TPAC on Non-Agenda Items	
9:40 AM	4.		Future Agenda Items • Regional Transportation Plan Update – System Development • ODOT Safety, Preservation & Bridge Programs • ODOT's Transportation Enhancement Programs • MOVES Update • Review of MTIP Process	**Robin McArthur, Chair**
9:45 AM	5.	*	Approval of TPAC Minutes for December 5, 2008	**Robin McArthur, Chair**
	6.		INFORMATION / DISCUSSION ITEMS	
9:50 AM	6.1	*	Resolution No. 09-4018, For the Purpose of Consideration of the Regional Travel Options Program Work Plan and Funding Suballocations for Fiscal Year 09-10 – INFORMATION	**Pam Peck**
10:20 AM	6.2	*	Recommendation on Regional Flexible Fund Allocation Options – DISCUSSION	**Ted Leybold**
11:05 AM	6.3	*	Regional Transportation System Management and Operations Refinement Plan Update– INFORMATION	**Deena Platman**
11:25 AM	7.		ADJOURN	**Robin McArthur, Chair**

* Material available electronically.
** Material to be emailed at a later date.
# Material provided at meeting.
All materials will be available at the meeting.

For agenda and schedule information, call Kelsey Newell at 503-797-1916, e-mail: kelsey.newell@oregonmetro.gov.
To check on closure or cancellations during inclement weather please call 503-797-1700.

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METRO

TRANSPORTATION POLICY ALTERNATIVES COMMITTEE
December 5, 2008
Oregon Convention Center, Room D133-134

MEMBERS PRESENT	AFFILIATION
Sorin Garber	Citizen
Elissa Gertler	Clackamas County
Nancy Kraushaar	Cities of Clackamas County
Alan Letho	TriMet
Mike McKillip	Cities of Washington County
Ron Papsdorf	Cities of Multnomah County
John Reinhold	Citizen
Karen Schilling	Multnomah County
April Siebenaler	Citizen

MEMBERS ABSENT	AFFILIATION
Jack Burkman	WSDOT
Brent Curtis	Washington County
John Hoefs	C-TRAN
Susie Lahsene	Port of Portland
Keith Liden	Citizen
Dean Lookingbill	SW Washington RTC
Dave Nordberg	Oregon DEQ
Louis Ornelas	Citizen
Satvinder Sandhu	FHWA
Paul Smith	City of Portland
Rian Windsheimer	ODOT, Region 1

ALTERNATES PRESENT	AFFILIATION
Clark Berry	Washington County
Jazmin Casas	FHWA
Lynda David	SW Washington RTC
Scott King	Port of Portland
Lidwien Rahman	ODOT, Region 1
Cory Ann Wind	Oregon DEQ

STAFF
Tom Kloster, Andy Cotugno, Randy Tucker, Tony Mendoza, Ted Leybold, Kelsey Newell, Kayla Mullis, Deena Platman, Joshua Naramore, Anthony Butzek, John Mermin, Crista Gardner, Cliff Higgins

1. CALL TO ORDER AND DECLARATION OF A QUORUM

Mr. Tom Kloster declared a quorum and called the meeting to order at 9:32 a.m.

2. COMMENTS FROM THE CHAIR AND COMMITTEE MEMBERS

Mr. Tom Kloster introduced Ms. Mara Gross as the new TPAC citizen member beginning in 2009. Ms. Gross will take Ms. Sreya Sarkar's seat on the committee. In addition he welcomed Ms. Cory Ann Wind as the new alternate for the Oregon Department of Environmental Quality.

Ms. Deena Platman of Metro introduced the PORTAL advisory committee members who will work with the Archived Data User Service Project.

Ms. Kim Ellis of Metro announced that the Joint TPAC/MTAC work group for the 2035 Regional Transportation Plan (RTP) will begin on January 12, 2009 and is open to committee members and interested parties. Mr. Ron Papsdorf announced that Mr. John Harker will take his place in representing the City of Gresham in the work group.

3. CITIZEN COMMUNICATIONS TO TPAC ON NON-AGENDA ITEMS

There were none.

4. FUTURE AGENDA ITEMS

Mr. Kloster briefly overviewed the future agenda items.

5. APPROVAL OF TPAC MINUTES FOR OCTOBER 31, 2008

Approval of TPAC minutes for October 31, 2008

MOTION: Mr. Alan Letho moved, Mr. Sorin Garber seconded, to approve the October 31, 2008 meeting minutes.

ACTION TAKEN: With all in favor, the motion passed.

6. INFORMATION/ DISCUSSION ITEMS

6.1 High Capacity Transit Screened Corridors and Evaluation Criteria

Mr. Tony Mendoza of Metro briefed the committee on key changes made to the High Capacity Transit (HCT) screening criteria specifically in regards to:

- Defining the meaning of HCT to focus only on high capacity options, which includes light rail, commuter rail, bus rapid transit and rapid streetcar.
- The transit corridor map has been modify to reflect changes made at former meetings.

ODOT raised concerns regarding:

- Availability and costs.
- HCT's effect on road capacity including bike trails.
- Consideration aspirations of community activity in evaluation.
- Keeping evaluation criteria consistent with the RTP transit concept not the 2040 land use concept.

In addition the committee discussed:

- Connectivity of lines.
- Methodology of rankings.
- Objection to social equity criteria and evaluation criteria.
- Absence of certain factors in ridership generation, specifically industrial areas.
- The time frame for implementing non-priority lines.
- Ensuring that concentrations of employers be included in ridership generator evaluation.

The City of Portland requested continued work and coordination with Metro on the Portland central city corridors.

The next HCT subcommittee meeting is tentatively scheduled for the end of January. Staff will distribute meeting information shortly.

6.2 Status Report

6.2.1 Resolution No. 09-4016, For the Purpose of Endorsing A Regional Position on Reauthorization of the Safe, Accountable, Flexible, Efficient, Transportation Act: Legacy for Users (SAFETEA-LU)

Mr. Andy Cotugno of Metro briefly discussed Resolution No. 09-4016 which reauthorizes the Safe, Accountable, Flexible, Efficient, Transportation Act: Legacy for Users (SAFETEA-LU). Mr. Cotugno emphasized that JPACT should act aggressively with their authorization project requests and be more conservative for the one-year appropriation requests. In addition, he stated that the current generality of the New Starts and Small Starts programs must be made more specific.

JPACT and the Metro Council will consider the resolution for adoption in January 2009.

6.2.2 Resolution No. 08-4013, For the Purpose of Endorsing the Transportation for America (T4America) Platform

Mr. Andy Cotugno briefed the committee on Resolution No. 08-4013 which would endorse the Transportation for America position on reauthorization of SAFETEA-LU. Mr. Cotugno informed the committee that TPAC is not required to make a recommendation on the resolution and that it will be considered for adoption at the next JPACT meeting.

6.2.3 Resolution No. 08-4003, For the Purpose of Endorsing the Final Regional Priorities for 2009 State Transportation Funding Legislation.

Mr. Randy Tucker of Metro briefed the committee on changes to Resolution No. 08-4003, which would endorse the final regional priorities for the 2009 state transportation funding legislation. Resolution No. 08-4003 is a refinement of the state priorities JPACT adopted as part of Resolution No. 08-3956 in June 2008.

Highlighted changes to the Resolution No. 08-4003 include:

- BE IT RESOLVED, No. 2, be updated to read, "that the Metro Council and JPACT ~~endorse [the Governor's proposed package or elements thereof to be completed after November 10]~~ support the proposed package by Governor Kulongoski, which reflects a balance between roads and multimodal investments; and…"
- A WHEREAS section be updated to read, "WHEREAS, that proposed package ~~includes [*to be completed after November 10*]~~ calls for $499 million annually in new revenues for roads and highways, a new 'ConnectOregon" package calling for $150 million in multimodal projects, the creation of a dedicated account for funding non-highway investments, new tools for addressing transit operating costs eventual dedication of 15% of lottery funds to multimodal transportation, and several reforms aimed at improving transportation governance and addressing the climate change impacts of transportation; and…"

Additional refinements highlighted include additional language on least-cost planning, non-motorized transportation and the distribution formula.

Mr. Tucker also highlighted staff concerns with Governor Ted Kulongoski's proposed transportation funding package, in particular the absence of bike and pedestrian facilities ("non-highway transportation infrastructure") in the multimodal component of the package.

The committee discussed road rehabilitation and funding for maintenance, furthering work to reduce vehicle miles traveled (VMT) and including facilities out of the right-of-way in the plan.

6.3 Metropolitan Transportation Improvement Program (MTIP) Local Project Solicitation Process

Mr. Ted Leybold introduced Mr. David Galati of the Local Government Section at ODOT. Mr. Galati is working on creating partnerships with Transportation Management Associations throughout the state to enhance local project delivery.

Mr. Leybold briefed the committee on the decision process for allocating Regional Flexible Funds (RFF). Mr. Leybold solicited the committee's opinion on how TPAC would like to make recommendations to JPACT for RFF funds. Committee comments included:

- Supportive of both recommending a single package of projects as a means of keeping the JPACT/Metro Council decision process simple as well as recommending multiple

options as a means of providing alternatives for JPACT consideration. Therefore, the decision process should only include multiple package options if JPACT expresses a clear interest in this approach and has general consensus on the themes or options they wish to consider.

- Any themes that guide development of multiple options (e.g. a single package of projects or multiple package options) must recognize the existing weighting criteria of the quantitative project evaluation process.
- Regardless of the number of recommendations (e.g. a single package of projects or multiple package options), any option will be evaluated by listing the option's strength and weaknesses relative to the narrowing process. Recommendation and evaluation should be presented to JPACT for adoption of a final list of projects to receive funding.

6.4 Regional Transportation Plan (RTP) System Update Process

The purpose of the RTP system maps is to define the extent of the regional transportation system based on the function(s) an individual facility serves. Refinements to the system map will inform the RTP system development phase that is planned to begin in January 2009.

Mr. John Mermin of Metro reminded the committee that edits to the five RTP system maps must be submitted electronically by January 30, 2009 and to contact him with any questions.

6.5 Bicycle Transportation Study by Jennifer Dill of Portland State University.

Ms. Jennifer Dill of Portland State University presented the results of her bicycle transportation study to the committee. The presentation included the following information and findings:

- Where the data is from and where funding came from.
- Why people are not bicycling more.
    - Traffic and safety are concerns holding back infrequent cyclists.
- The role of infrastructure.
    - Cyclists are going longer distances to use bicycle infrastructure.
- Comparing men and women cycling habits.
- What is the data telling us?
- Next steps.

Committee discussion included the importance of bike infrastructure, the difficulty of building bike infrastructure in suburban communities, and re-sampling in order to further confirm and add to these findings.

7. ADJOURN

As there was no further business, Mr. Kloster adjourned the meeting at 12:01 p.m.

Respectfully submitted,

Kayla Mullis
Recording Secretary

ATTACHMENTS TO THE PUBLIC RECORD FOR DECEMBER 5, 2008
The following have been included as part of the official public record:

ITEM	TOPIC	DOC DATE	DOCUMENT DESCRIPTION	DOCUMENT NO.
	Agenda	N/A	Updated TPAC Agenda	120508t-01
2.	Memo	12/5/08	To: TPAC From: Robin McArthur RE: Approve appointment of members to PORTAL Advisory Committee	120508t-02
6.1	Memo	12/5/08	To: TPAC From: Tony Mendoza RE: High Capacity Transit System Plan Screening Criteria Update - REVISED	120508t-03
6.1	Memo	12/1/08	To: HCT Subcommittee From: Thomas Brennan RE: Preliminary HCT Screening Results - DRAFT	120508t-04
6.1	Memo	12/8/08	To: HCT Team From: Steer Davies Gleave & Nelson/Nygaard RE: Portland HCT	120508t-05
6.1	Memo	12/4/08	To: JPACT From: Tony Mendoza RE:HCT System Plan Update	120508t-06
6.2.1	Resolution	N/A	Updated Resolution No. 09-4016 presented by Andy Cotugno	120508t-07
6.2.2	Resolution	N/A	Resolution No. 08-4013 regarding Transportation for America presented by Andy Cotugno	120508t-08
6.2.3	Resolution	N/A	Updated Resolution No. 08-4003 presented by Randy Tucker	120508t-09
6.5	PowerPoint	12/5/08	*Where Do People Bicycle? The Role of Infrastructure in Determining Bicycling Behavior* presented by Jennifer Dill	120508t-10

BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF CONSIDERATION OF THE REGIONAL TRAVEL OPTIONS PROGRAM WORK PLAN AND FUNDING SUBALLOCATIONS FOR FISCAL YEAR 09-10.	)))	RESOLUTION NO. 09-4018 Introduced by Rex Burkholder

.

WHEREAS, the Metro Council and Joint Policy Advisory Committee on Transportation established funding levels for the Regional Travel Options Program in the 2008-2011 Metropolitan Transportation Improvement Program through the Transportation Priorities funding process; and

WHEREAS, the Metro Council approved a five-year strategic plan for the Regional Travel Options Program in March 2008 that established goals and objectives for the Regional Travel Options Program; and

WHEREAS, the Regional Travel Options Subcommittee of the Transportation Policy Alternatives Committee (TPAC) adopted proposed work plans and funding sub-allocations to TriMet and Wilsonville SMART for Regional Travel Options program activities in fiscal year 2009-2010 on January 9, 2009; and

WHEREAS, the proposed work plans and funding sub-allocations support implementation of the Regional Travel Options Program five-year strategic plan; now therefore

BE IT RESOLVED that the Metro Council supports the Regional Travel Options Program fiscal year 2009-2010 work plan and funding sub-allocations.

ADOPTED by the Metro Council this 19th day of February, 2009

David Bragdon, Council President

STAFF REPORT

IN CONSIDERATION OF RESOLUTION NO. 09-4018, FOR THE PURPOSE OF CONSIDERATION OF THE REGIONAL TRAVEL OPTIONS PROGRAM WORK PLAN AND FUNDING SUBALLOCATIONS FOR FISCAL YEAR 2009-2010.

Date: December 29, 2008 Prepared by: Pam Peck

BACKGROUND

The Regional Travel Options (RTO) Program implements regional policy to reduce reliance on the automobile and promote alternatives to driving for all trips. The program emphasizes all alternative modes of travel and all trip purposes, reflecting policies in the Regional Transportation Plan. The Metro Council approved a five-year strategic plan for the Regional Travel Options program in March 2008 that established goals and objectives for the program.

Key components of the RTO program include a collaborative marketing program, regional rideshare program, transportation management association program, and grant program that provides funds to partner agencies and organizations through a competitive project selection process. Program activities are implemented by partner organizations and agencies, as well as by Metro staff and consultant contracts administered by Metro.

The Metro Council and Joint Policy Advisory Committee on Transportation established funding levels for the Regional Travel Options Program in the 2008-2011 Metropolitan Transportation Improvement Program through the Transportation Priorities funding process. The Regional Travel Options Subcommittee of TPAC is charged with recommending detailed work plans, and grant awards and funding sub-allocations to partner agencies and organizations to support program implementation activities.

The subcommittee adopted the attached proposed work plan for fiscal year 2009-2010 (Attachment 1) at their December 10, 2008 meeting. The work plan continues implementation of the program's five-year strategic plan and includes recommendations for the sub-allocation of program funds to TriMet and Wilsonville SMART. The funding sub-allocations will result in an MTIP amendment that enables TriMet and Wilsonville SMART to apply directly to the Federal Transit Administration for funds to support RTO program implementation activities related to employer and community outreach.

In addition, the work plan budget designates the portion of Metro funds that will be awarded to Transportation Management Associations (TMAs), government agencies and non-profit organizations through grants and funding agreements. Attachment 2 provides a summary of RTO grant awards recommended by the RTO Subcommittee of TPAC through a competitive process. TMAs grants are not included in the summary, as TMA funds are awarded on an ongoing basis by the RTO Subcommittee to TMAs that meet performance criteria. Grant awards to individual TMAs for fiscal year 2009-2010 will be considered by the RTO Subcommittee in May 2009.

ANALYSIS/INFORMATION

1. **Known Opposition**: None.

2. **Legal Antecedents:**

1991 Federal Clean Air Act Amendments. The need for a comprehensive regional TDM program was addressed in Metro Resolution No. 91 – 1474 in response to the Oregon Transportation Planning Rule and the Federal Clean Air Act Amendments of 1990.

TDM Subcommittee. The TPAC TDM Subcommittee was established by Metro Resolution 92 – 1610. Oversight for the development and evaluation of TDM strategies, and formation of final recommendations to TRANSPORTATION POLICY ALTERNATIVES COMMITTEE (TPAC), JOINT POLICY ADVISORY COMMITTEE ON TRANSPORTATION (JPACT) and Metro Council concerning TDM planning, programming and implementation activities were assigned to the Subcommittee.

TDM Relationship to DEQ's Ozone Maintenance Plan (Governor's Task Force on Motor Vehicle Emissions Reduction (HB 2214). The task force recommended a base plan focused on specific strategies to maximize air quality benefits. The air quality strategies selected by the region formed the base for a 10-year air quality maintenance plan for the Portland area. The primary TDM transportation control measures (TCMs) in the maintenance plan are the employee commute options program (ECO) and the regional parking ratio program.

Transportation Management Association (TMA) Policy. The policy basis and funding strategy for TMAs was adopted through Metro Resolution No. 98 – 2676. Metro Resolution No. 99- 2864 allocated regional funding to existing and new TMAs. Metro Resolution No. 02 – 3183 revised TMA policy by calling for balanced support of existing TMAs with the start-up of new TMAs.

2000 Regional Transportation Plan. The RTP establishes regional TDM policy and objectives to help reduce vehicle trips and vehicle miles traveled. Chapter 1 (Ordinance 00 – 869A and Resolution 00 – 2968B) provides TDM policies and objectives that direct the region's planning and investment in the regional TDM program.

Regional Travel Options 5-Year Strategic Plan. The strategic plan established a new vision for the region's transportation demand management programs and proposed a reorganized and renamed Regional Travel Options program that emphasized partner collaboration to implement an integrated program with measurable results. JPACT and the Metro Council adopted the plan through Resolution No. 04-3400, which also renamed the TDM Subcommittee the RTO Subcommittee, and was adopted in January 2004.

2035 Regional Transportation Plan. The federal component of the plan, pending air-quality analysis, was approved by Metro Council Resolution No. 07-3831B on Dec. 13, 2007. The RTP establishes system management and trip reduction goals and objectives that are supported by the RTO program strategies.

Regional Travel Options 5-Year Strategic Plan. The strategic plan established goals and objectives for Regional Travel Options program for 2008 to 2013. JPACT and the Metro Council adopted the plan through Resolution No. 08-3919 in March 2008.

3. **Anticipated Effects**: Sub-allocates $385,220 of RTO program funds to support the TriMet Employer Program and $62,315 to support Wilsonville SMART's Community and Employer Programs in fiscal year 2009-2010.

4. **Budget Impact**s: The proposed budget includes $12,331 in Metro funds to match federal grant funds for that will be used to support program administration, evaluation, and regional rideshare services.

RECOMMENDED ACTION

1. Approve the fiscal year 2009-10 work plan and budget for the Regional Travel Options program described in Attachment 1 to the staff report, actual budget levels for RTO activities carried out by Metro will be established through the FY 09-10 Metro budget decision-making process.
2. Approve the funding sub-allocations to TriMet and Wilsonville SMART described in described in Attachment 1 to the staff report.

Res. 09-4018 Attachment 1

Regional Travel Options Program

FY 2009-2010 work plan

Dec. 10, 2008

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Background

The Regional Travel Options (RTO) Program implements regional policy to reduce reliance on the automobile and promote alternatives to driving for all trips. The program emphasizes all alternative modes of travel and all trip purposes, reflecting policies in the Regional Transportation Plan.

This scope of work identifies the activities and tasks that will be carried out by Metro RTO staff to implement the Regional Travel Options 2008-2013 Strategic Plan in fiscal year 2009-2010. The strategic plan was developed by the RTO subcommittee of the Transportation Policy Alternatives Committee (TPAC) in 2007 and adopted by the Metro Council in March 2008. The strategic plan established the following program goals:

Goal 1: Continue a regional collaborative marketing campaign to increase awareness and use of travel options and reduce drive-alone car trips.

Goal 2: Support employers and commuters to increase the use of travel options for commute trips.

Goal 3: Provide information and services to support increased use of travel options for all trips.

Goal 4: Promote and provide services that support increased use of travel options in local downtowns and centers.

Goal 5: Report progress to aid decision-making and encourage innovation.

Goal 6: Follow a collaborative decision-making structure that provides program oversight and advances the goals and objectives of the Regional Transportation Plan (RTP).

Key program objectives for fiscal year 2009-2010

- Coordinate the regional collaborative marketing program and support implementation of ODOT Drive Less/Save More marketing campaign in the Portland metropolitan area.
- Administer RTO travel options, individualized marketing and Transportation Management Association (TMA) grants and provide technical assistance to grant recipients.
- Coordinate multi-agency employer and commuter outreach activities and support partner collaboration.
- Market CarpoolMatchNW.org and Metro Vanpool to employers and commuters in coordination with the multi-agency employer outreach program
- Work with partner organizations to develop a multi-state, on-line ridematching system, serving Idaho, Oregon and Washington.
- Collect, analyze and report data for each RTO program to ensure that funds are invested in the most cost effective ways

Collaborative marketing

The RTO Collaborative Marketing Program works to increase awareness and use of travel options and to reduce drive-alone car trips. Metro's scope of work will focus on coordination of marketing activities carried out by all RTO partners to maximize the program's effectiveness and reach target audiences identified in the 2008-2013 RTO strategic plan. Partner coordination will be carried through the Collaborative Marketing Working group, the development of a regional events calendar and a regional earned media calendar.

Overall management of the Drive Less/Save More Marking Campaign will shift from Metro to ODOT in June 2009. Metro RTO staff will continue to support implementation of the campaign in the Portland metropolitan area through development and coordination of earned media activities that highlight RTO programs, direct outreach at up to twelve community events selected in coordination with RTO partners, and the development of local campaign sponsors and partnerships. RTO staff will look for opportunities to collaborate with Metro's Sustainability Center to coordinate campaign outreach with other social marketing programs. In addition, Metro staff will also act as the liaison to the statewide effort and will disseminate campaign tools and information to RTO partners.

RTO staff will also work to promote the benefits of bicycling and walking and to increase the use of these modes for transportation purposes. Activities in this area will include disseminating safety messages and information and promoting the use of regional trails for transportation purposes. RTO staff will coordinate activities in this area with staff from Metro's Long-Range Transportation Planning and Trails Planning work groups and the regional Connecting Green Initiative. Marketing and promotions in this area will focus on Metro's Bike There! and Walk There! programs.

Metro RTO staff will provide project oversight, support sales, marketing and distribution, and implement marketing strategies for the regional Bike There! map. The Bike There! map will be updated in FY 09-10 with additional support from Metro's Long-Range Transportation Planning section and in coordination with the Regional Trails Program to include updated bicycle suitability and safety information. Funds for printing the updated map were generated by the sales of the map over the previous three years.

Metro, Kaiser Permanente and other partners distributed more than 35,000 free copies of the Walk There! guidebook in FY 08-09. Metro is in discussions with Kaiser Permanente about making the program self-sustaining by reprinting the publication in early 2009 and selling a portion of the books (some books would continue to be provided for free through Kaiser's community health programs). In addition, Metro and Kaiser are exploring the development of a series of up to 20 community walking events to promote walking for short trips and use of regional trails for transportation purposes. If Kaiser provides funds for these projects in FY 08-09, Metro RTO staff will provide project oversight, support sales, marketing and distribution, and coordinate any remaining walking events in FY 09-10. Revenue from the guidebook sales will be used to support the development and printing of future editions.

Metro RTO collaborative marketing staff will be the primary Metro staff contact for RTO individualized marketing grants, as well as for any travel options grants that have a relationship to the collaborative marketing program. In this capacity RTO staff will review progress reports, compile comprehensive progress reports for the RTO Subcommittee and the FTA, and work with the RTO financial analyst to recommend payment of grant invoices. Metro RTO program staff, augmented by contracted professional services, will carry out the following tasks:

- Support marketing working group for effective coordination and partner communication.
- Support implementation of ODOT's Drive Less/Save More campaign in the Portland metropolitan area, coordinate earned media opportunities, represent the campaign at up to twelve community events, disseminate campaign information to RTO partners, and act as liaison to ODOT.
- Develop regional calendar of events, coordinate presence of RTO partners and provide staff support for one community event per month.
- Research and develop white papers and fact sheets to support consistent messaging in RTO marketing activities.
- Develop RTO collateral materials consistent with the Drive Less/Save More campaign, including fact sheets, brochures, web pages, and other collateral materials.
- Provide oversight for Metro's regional Bike There! map product, implement map marketing strategies, oversee sales and distribution, and support collaboration with local and regional partners related to development of bike maps.
- Provide oversight for Metro's regional Walk There! guidebook, implement marketing strategies, oversee sales and distribution, and support collaboration with local and regional partners related to the promotion of walking for short trips.
- Review progress reports for individualized marketing projects and travel options grants related to collaborative marketing activities, compile comprehensive progress reports, and work with the RTO financial analyst to recommend payment of grant invoices.
- Coordinate collaborative marketing activities with other Metro departments to leverage resources and further disseminate program messages.

Key milestones for FY 09-10

- September 09 – Earned media and events calendars for next quarter completed.
- December 09 – Earned media and events calendars for next quarter completed.
- March 10 – Earned media and events calendars for next quarter completed.
- June 10 – Earned media and events calendars for next quarter completed.

Deliverables

- RTO collateral materials
- RTO events calendar
- RTO earned media calendar
- Updated Bike There! map
- Quarterly progress reports

Commuter services

The 2008-2013 Regional Travel Options Strategic Plan calls for increased efforts to coordinate the outreach activities of partner's employer and commuter programs. The intended outcomes include avoiding duplication of effort, leveraging resources, and more strategic delivery of services to locations where the greatest impact can be attained. Employer and commuter programs are projected to reduce approximately 47,660,000 vehicle miles of travel per year during the plan timeline.

Currently, the following partners carry out employer and commuter programs: Metro, Oregon Department of Environmental Quality (DEQ), TriMet, Wilsonville SMART, Vancouver Commute Trip Reduction Program, Portland Transportation Options and Transportation Management Associations (TMAs).

A large portion of employer outreach is generated by the Employee Commute Options (ECO) program. The DEQ is responsible for oversight and implementation of the ECO program (OAR 340.242). In its current form, this program mandates that Portland-region businesses with over 100 employees at a given worksite must have a plan in place which aims to reduce by 10 percent from an established baseline the number of drive-alone auto trips to that worksite. This regulation has been in effect in the Portland region since 1996.

The DEQ, TriMet and other regional partners are currently working with 787 affected businesses, 85 percent of which are in compliance, which represents 668,000 employees (35 percent) of the region's employees, making this an effective means of conducting outreach to businesses around the region. This work plan builds on the existing ECO program framework and will encourage all employers working with RTO partners to achieve the 10 percent reduction goal and to use a survey similar to the ECO survey to measure progress.

RTO staff will explore opportunities to collaborate with Metro's Sustainability Center to better integrate agency employer outreach efforts, leverage investments in technology, and coordinate messages.

Metro will continue management of the regional vanpool program and provide subsidies to eligible groups of commuters. Beginning in FY 09-10, C-TRAN will no longer provide funding to Metro to subsidize Washington-based vans and will instead begin operation of their own vanpool fleet. Metro will continue to work closely with C-TRAN to market their vanpools to Portland area employers. Metro will begin work in January 2009 to release a new RFP for vanpool lease providers, building on lessons learned during 06-09 vanpool contract period.

Metro RTO program staff, augmented by contracted professional services, will carry out the following tasks to coordinate the employer program and provide commuter services:

- Coordinate partner outreach activities, facilitate communication between partners and identify a lead agency or organization for each employment site.

- Develop a standardized approach to conducting, tracking and evaluating employer outreach activities.
- Identify target markets and business sectors.
- Add to and standardize the amount of data collected on employer efforts.
- Create a web-based resource for employers in the Drive Less web site that links them to RTO partner programs and services.
- Implement a regional employer recognition program.
- Utilize and maintain a shared contact management database to track employer program contacts and outcomes.
- Provide assistance to other partners at strategically selected outreach events.
- Provide lead role in working with businesses needing rideshare assistance.
- Provide initial response to phone or web-generated contacts; assess level of interest and coordinate hand-off to appropriate external partner.
- Maintain ridematching database, create scatter maps and other outreach tools and collateral materials as needed.
- Review progress reports for travel options grants related to employer outreach activities, compile comprehensive progress reports, and work with the RTO financial analyst to recommend payment of grant invoices.
- Collaborate with Metro's Sustainability Center to better integrate agency employer outreach efforts, leverage investments in technology, and coordinate messages.

Key milestones for FY 09-10

- September 09 – Implementation of contact management database
- September 09 – Employer outreach coordination plan complete
- September 09 – Quarterly report completed
- December 09 – Collateral materials web site online (ongoing development)
- December 09 – Quarterly report completed
- March 10 – Quarterly report completed
- June 10 – Quarterly report completed

Deliverables

- Plan for standardizing, conducting and evaluating employer outreach activities.
- Contact management database.
- Collateral materials and web information
- Employer outreach calendar.
- Quarterly progress reports.

Traveler information tools

This program activity serves to provide information and services supporting increased use of travel options for all trips. In FY 09-10 RTO staff will continue to work with partner organizations led by Washington State Department of Transportation (WSDOT) to develop a multi-state, on-line ridematching system, serving Idaho, Oregon and Washington. The proposed system will be an off-the-shelf program procured by WSDOT to replace a variety of systems currently in use by transit and rideshare agencies in the Northwest. This system will replace Metro's existing system, CarpoolMatchNW.org. Initial implementation is expected to take place late summer/fall 2008 with various system expansions taking place over the next two to three years. Development of a new marketing and outreach effort will be conducted, potentially at the state level in concert with other rideshare agencies and Oregon Department of Transportation (ODOT).

Metro RTO staff will carry out the following tasks in 09-10:

- Continue discussions Oregon Department of Transportation (ODOT) staff to expand their involvement and commitment to marketing and operation of the regional rideshare system.
- Work with WSDOT on implementation issues related to the new rideshare system.
- Establish contracts and agreements related to rideshare system operations and maintenance.
- Review progress reports for travel options grants related to traveler information tools, compile comprehensive progress reports, and work with the RTO financial analyst to recommend payment of grant invoices.

Key milestones for FY 08-09

- September 09 – Quarterly report completed
- December 09 – Quarterly report completed
- December 09 – Ridematching system implementation and agreements
- March 10 – Quarterly report completed
- June 10 – Quarterly report completed

Deliverables

- Ridematching system
- Quarterly progress reports

Downtowns and centers

The Regional Travel Options Program promotes and provides services that support increased use of travel options in local downtowns and centers by supporting grants to local jurisdictions, non-profit groups and public private partnerships. The RTO program provides ongoing support to six area Transportation Management Association (TMAs). TMAs are nonprofit coalitions of local businesses and/or public agencies that work in centers and employment areas to strengthen partnerships with businesses to reduce traffic congestion and pollution by improving commuting options for their employees. The RTO Subcommittee will consider the results of a South Waterfront TMA feasibility study in FY 08-09. If the Subcommittee approves regional start-up funding for this TMA, Metro will provide services to seven TMAs in FY 09-10.

Metro RTO staff will carry out the following tasks related to downtowns and centers program objectives:

- Provide technical assistance for TMA project planning, implementation and evaluation activities.
- Develop work plans for each TMA that support the unique character of each area and recognize that each area is at a different level of development and has a unique mix of transportation infrastructure.
- Develop and manage TMA funding agreements.
- Coordinate meetings of TMA directors.
- Track TMA performance toward meeting outreach and performance targets.
- Provide progress reports to the RTO subcommittee.

Additional downtowns and centers objectives will be carried out through the Regional Travel Options grant program. Grant program tasks, milestones and deliverables are described in the program administration portion of this work plan.

Key milestones for FY 09-10

- Sept 09 – TMA directors meeting held
- Jan 10 – TMA directors meeting held
- March 10 – TMA directors meeting held
- May 10 – TMA work plans and booster grant proposals presented to RTO Subcommittee.
- June 10 – TMA work plans and contracts finalized.

Deliverables

- TMA work plans and agreements
- Quarterly progress reports

Measurement

This program collects, analyzes and reports data for each RTO program to ensure that funds are invested in the most cost-effective ways. Evaluation reports are used to refine program development, marketing and implementation. RTO program staff will be responsible for carrying out Goal 5 (Measurement) of the RTO Strategic Plan and the RTO Evaluation Framework, approved in 2007.

The Evaluation Framework guides the level of analysis for each type of RTO project. It also clarifies that both RTO staff and RTO-funded partners have a key role in data collection. RTO will continue to use independent researchers to evaluate the program.

Metro's Travel Research and Modeling staff and Data Resource Center staff will be called upon to consult on the development of new research methods and tools.

Metro RTO staff will carry out the following tasks related to measurement and evaluation in FY 09-10:
:

- Conduct on-going data collection and tracking for RTO-funded programs.
- Disseminate findings from the independent evaluation of RTO programs completed by PSU in FY 08-09.
- Provide technical assistance to all RTO-funded partners.
- Develop information-sharing partnerships.
- Explore new methods and tools for storing data, analyzing data and reporting.

Key milestones for FY 09-10

- Present findings from the independent evaluation of RTO programs completed by PSU in FY 08-09.

Deliverables

- Data is collected and methods and databases improved.
- Technical services provided to RTO partners.
- Information-sharing partnerships are developed.

Policy, funding and program administration

This scope of work supports the program structure called for by the strategic plan including administration and management of RTO program functions by Metro.

The RTO program staff will:

- Chair and support RTO Subcommittee of TPAC, including logistics, scheduling and production of meeting summaries.
- RTO Subcommittee research and support on technical and financial issues.
- Create presentations about RTO program for Metro committees and regional partners.
- Administer contracts and agreements for RTO programs.

- Develop and submit FTA application for CMAQ grant funds and administer grants for RTO programs.
- Identify local matching funds sources for future years.
- Complete Business Energy Tax Credit (BETC) applications for the vanpool program.
- Develop the RTO work plan and program budget for fiscal year 10-11.
- Provide local transportation system plan support on achieving 2020 non-SOV targets.
- Provide staff support for demand management and parking components of the Regional Transportation Plan Update and the Transportation System Management and Operations (TSMO) policy update.
- Represent RTO program at Metro committees and jurisdictions and agency meetings.

Key milestones for FY 09-10

- Nov 09 – FY 09-10 work program and budget reviewed and adopted by RTO subcommittee
- Feb 10 – FY 09-10 work program and budget reviewed and adopted by TPAC, JPACT and the Metro Council
- June 10 – Submit BETC applications for FY 09-10 projects.

Deliverables

- FY 10-11 budget
- RTO subcommittee meeting summaries
- Quarterly progress reports

RTO BUDGET 2009-2010				
Revenues: (as of 7-1-2008)	**08-09 Available**	**(BUDGETED) FY 09-10**		**Totals**
		#14442		
	-	1,800,000		1,800,000
MTIP Key 14441	681,125	615,737		615,737
MTIP Key 14443	380,000	-		-
Bike There! (Current year sales)	-	17,510		17,510
Walk There! (Current year sales)	-	60,000		60,000
Walk There! (Current Year Grant)	-	10,000		10,000
Metro match (General Fund)		12,331		12,331
Fund Balance:				
BETC (prior years)	50,000	50,000		50,000
Total Revenue to/from Metro:	1,111,125	2,565,578		2,565,578
Expenditures:	**FTE**	**(BUDGETED) FY 09-10**		**Totals**
Administration:				
FTE	0.758	104,657		104,657
M & S		10,106		10,106
Evaluation and Measurement:				
FTE	1.500	167,513		167,513
M & S		11,192		11,192
Collaborative Marketing:				
FTE	1.220	102,977		102,977
Sponsorships		22,054		22,054
M & S		56,238		56,238
Commuter Program:				
FTE	1.500	144,993		144,993
TriMet		385,220		385,220
SMART		62,315		62,315
Ridematch		50,000		50,000
M & S		60,281		60,281
RTO Grants:				
FTE	0.600	85,879		85,879
Travel Options		262,500		262,500
Individualized Marketing		356,000		356,000
TMA:				
FTE	0.500	73,964		73,964
TMA Grants		153,000		153,000
Booster Grants		125,000		125,000
South Waterfront		75,000		75,000
Regional Vanpool:				
FTE	0.500	73,989		73,989
M & S		182,700		182,700
Total expenditures	6.578	2,565,579		2,565,579
Budget Surplus/(Shortfall)		(0)		(0)
Partners Match:				
Partners match		237,059		237,059
Total Match:		237,059		237,059
Total Expense		2,802,638		2,802,638

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Metro | *Memo*

Date: December 29, 2008

To: TPAC

From: Pam Peck, Metro RTO Manager

Re: **RTO Subcommittee Grants Awards Summary**

Background

The Regional Travel Options (RTO) program carries out regional strategies to increase use of travel options, reduce air pollution and carbon emissions, and improve mobility. The RTO program receives federal Congestion Mitigation and Air Quality (CMAQ) funds through the regional Flexible Funds decision-making process. The CMAQ funds are used to support grants to local jurisdictions and non-profit organizations to advance RTO program objectives. Projects must be carried out within the Metro boundary, which includes the urbanized portions of Clackamas, Multnomah and Washington counties.

The RTO Subcommittee of TPAC conducts a competitive process to select projects for RTO grant funding. In 2008, the Subcommittee established two grant categories with unique scoring and selection criteria, a general category for projects that will be carried out from July 2009 to June 2011, and an individualized marketing category for projects that will be carried out from March 2009 to June 2012. Proposals were scored by a Subcommittee working group and a package of proposed grant awards in each category was forwarded to the RTO Subcommittee for approval. This memo summarizes the grant awards in each category adopted by the Subcommittee at November 12, 2008 meeting.

Travel options grants

Regional projects

Program and recipient	Grant award	Project description
Multi-Modal Trip Planner TriMet	$68,930	The project will test the usability of an Open Source Multi-Modal Trip Planner System which is expected to increase mode share for bike, walk, and transit trips during peak commute hours while decreasing drive-alone trips.
Bike Commute Challenge BTA	$25,000	The BTA bike commute challenge-work place against workplace-to see who can get the most people biking in September. Any business, non-profit or public agency is eligible to participate. Individual cyclists may also participate. This program reduces single-occupant vehicle use and traffic congestion and improved air quality by encouraging people to try bike commuting.
Carefree Commuter Challenge WTA	$38,000	The Carefree Commuter Challenge is a regional auto trip reduction program creating excitement, competition and camaraderie at the workplace. WTA staff provides a turn-key trip reduction program to employers to help them motivate employees to take transit, bike, walk, carpool, vanpool and telecommuting instead of driving alone.

TriMet Bike Park TriMet	$50,000	TriMet will install electronic-access bike lockers at Beaverton Transit Center with space for 22 bikes and evaluate their effectiveness as a strategy for encouraging bicycling to transit. Evaluation will include the controlled-access bike parking facility at the Portland State University light rail station. As 39% of MAX bike passengers would drive if they did not have a bike-transit option, this project will increase the number of bicycling and transit trips while decreasing drive-alone trips.

Local projects

Program and recipient	**Grant award**	**Project description**
Lloyd Links Lloyd TMA	$41,445	Lloyd Links will link Lloyd employees from the residence to their Lloyd work sites via personal contact and direct one-on-one assistance. This is coupled with education, promotion, incentives and evaluation.
Sunday Parkways City of Portland	$30,000	Sunday Parkways provide a car-free environment where families, cyclist, walkers and others can enjoy our streets and parks. Sunday Parkways reduce auto trips, improve air quality, increase the health and activity levels of residents and increase the awareness and acceptability of bicycling and walking as modes of travel in Portland. The grant will support three (3) Sunday Parkways in North and Northeast Portland in 2009.
Tigard Bike Map City of Tigard	$20,000	This project will replace the long outdated Tigard-area bike map published in 1983, with an upgraded and enhanced city bike-route map. The map would supplement the current Metro Bike There! Map, which provides limited coverage of Tigard and includes few low traffic (green) and moderate traffic (yellow) street designations in comparison with other areas. The inclusion of other information as grades, key neighborhood trails accessways, bus stops, transit and how to access transit, including commuter rail, will make it easier for bicyclists to use the bicycle for all types of transit trips. The map is part of a city strategy to make bicycling safer and more convenient through a variety of efforts.
Bike Racks for Commuters WTA	$15,000	Bike Racks for Commuters program will make staple racks available to businesses that participate in the WTA's Westside Commuter Club and will offer $100 toward installation or city fees. Employers can add funding if there is a greater need for more than two racks. Employees will be encouraged to try cycling with well-sited bike parking on company property.
Wilsonville Bike/Ped Coordinator Wilsonville SMART	$80,000	The project will expand the SMART Options program by hiring a Bike and Pedestrian Coordinator who will implement priorities set forth in the City if Wilsonville's Bicycle and Pedestrian and Transit Master Plan. As well as creating tools, such as maps and brochures, this person will build on the established community walking and biking programs to engage the growing community interest and establish a structured program similar to the City of Portland's "Options Ambassadors".
Swan Island TNT (Trip Not Taken)	$28,000	The project seeks to reduce vehicle miles traveled by encouraging Swan Island employees to relocate to adjacent neighborhoods in

Swan Island TMA		North and inner Northeast Portland and by helping residents of those neighborhoods find job and career opportunities on Swan Island.
Gresham Way Finding City of Gresham	$50,000	The City of Gresham will install a network of pedestrian and bicycle way-finding signs to aid travelers in finding the locations of local amenities and facilities. The signs will include arrows and distance markers. The City will also produce a bicycle map for the Gresham area that will show bicycle routes and amenities.
Diverse Cultures Cycling Needs Assessment and Pilot Project Community Cycling Center	$78,625	The proposed project aims to increase the awareness and acceptability of bicycling as a transportation option among minority and low-income participants in North and Northeast Portland by creating a culturally-specific program to meet the unique needs of a diverse community. The project will reach 250 people through ten community organizations included in a culturally-appropriate needs assessment. Results will be applied to develop a pilot program to increase bicycle trips and reduce car trips among these target audiences.

Individualized marketing grants

Individualized marketing projects identify people within a specific geographic area who want to change the way they travel. The projects use personal, individualized contact to motivate travel behavior change. Projects in Portland and more than 300 cities around the world have achieved significant reductions in the number of people driving alone and increased the number of people cycling, walking and using transit.

Recipient	Grant award	Project	Timeline
City of Portland	$200,000	North/Northwest SmartTrips (approx. 25,000 households)	Spring 2009 to Fall 2009
City of Gresham	$100,000	Project will target residents who live within one-half mile of the Civic Drive MAX Station (approx. 6,500 households)	Spring 2009 to Fall 2011
City of Portland	$300,000	Green Line SmartTrips (approx. 27,000 households in east Portland adjacent to MAX Green Line)	Summer 2009 to Fall 2010
City of Wilsonville SMART	$228,480	Project will target residential areas of Wilsonville (approx. 5,942 households)	Summer 2010 to Fall 2011
City of Portland	$171,520	Street Car Loop and South Waterfront SmartTrips (approx. 20,000 households, contingent on completion of Street Car Loop project)	Winter 2011 to Spring 2012

For more information

Contact Pam Peck, Metro RTO Manager, at Pam.Peck@oregonmetro.gov or 503-797-1866.

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Metro | *Memo*

Date: December 27, 2008

To: TPAC and Interested Parties

Cc:

From: Ted Leybold, MTIP Manager

Re: Narrowing RFF projects to final recommendation

TPAC is being asked to make a recommendation of funding to regional programs and to select, from the pool of local applications, projects to receive approximately $21.65 in funding. To create a recommendation for JPACT and Metro Council consideration, technical staff will address the following Narrowing Factors as previously directed to narrow to a final list of projects:

Narrowing factors

The following factors will be used in developing a technical staff recommendation to JPACT and the Metro Council of projects to fund from the pool of local applications.

- Top projects within an evaluation category (Regional mobility corridors, Mixed-use area implementation, Industrial and employment area implementation, Environmental enhancement, and Project development) at clear break points in quantitative scores.

- Qualitative issues associated with projects
    a. Prior commitments
    b. Links to other significant projects
    c. Affordable housing and school access
    d. Overmatch of required funding from other sources
    e. Economic impact and jobs benefit
    f. Environmental justice issues
    g. Project delivery issues.

- Ability to fund projects throughout the region.

- Meet air quality requirements for construction of miles of bike (5 miles) and pedestrian (1.5 miles) facilities and a minimum of $7.2 million on those facilities.

- For project development applications, consider:
    a. For large projects, the ability to leverage other discretionary sources and funding strategy for future phases is in place
    b. The construction phase of the project would likely address program policy priorities and score well in a quantitative evaluation

c. Appropriate project scope relative to project readiness and RTP planning goals and system needs.

- Public comments regarding support or opposition to the project as proposed.

Issue

Different combinations of local projects can be formed that would address the multiple narrowing factors, but policy trade-offs are presented with the selection of alternatives. Fully funding the top tier quantitatively ranked projects, funding local construction projects throughout the region and meeting the $7.2 million minimum bike/ped allocation could range from $24 to $27.2 million, depending on the projects selected.

TPAC has the task of working through the trade-offs to select a project list that the committee feels best balances the trade-offs between the narrowing factors and meets the $21.65 million of available funding.

Tradeoffs

Tradeoff A: Developing a recommendation that addresses the policy narrowing factors of funding Top Tier technically ranked projects, funding projects throughout the region, and meeting the minimum $7.2 million target for bike/ped projects.

Summary
Fully funding the top-tier quantitatively scored projects in each evaluation category would allocate $15.55 million of the $21.65 million but does not fund a project in each sub-area of the region nor meet the minimum funding target of $7.2 million for bike and pedestrian projects. Adding a second-tier project from East Multnomah and Clackamas Counties could add $5.7 to $6.6 million with an additional $2.8 to $5.1 million needed to meet the bike/ped minimum target. Consideration of the Bus Stop Development/Streamline program (at a cost of up to $3.6 million) is also an option to address funding projects across the region.

Tradeoff B: How to address the minimum $7.2 million and minimum length targets for Pedestrian and Bike projects

Summary
After consideration of Tradeoff A, there will remain the need to consider how to address the $7.2 million minimum target. Whether the minimum is met and whether to focus on construction projects or on project development are options for consideration. The qualitative factors, project development considerations and public comments should be considered in selecting the projects to address the minimum funding target.

Tradeoff C: Consider the scaling of project scope for the regional candidate projects.

Summary
Alternative C presents how the Bus Stop Development/Streamline program and the School Bus Engine emission reduction can be scaled to help get to the $21.65 million target amount. These represent projects that can be scaled by funding more or fewer project components.

Scaling of projects

Proposals for scaling back project applications (in either length or scope) as a means of funding more projects, will need to be submitted to Metro staff by January **16th** for analysis of feasibility. The analysis will be presented at the January **30th** TPAC meeting. Any proposal not submitted by this time will not be endorsed by Metro staff as feasible.

Process

TPAC will be asked whether they would like to nominate a list of projects or have Metro staff propose options for consideration to address the issue of balancing the narrowing factors. Metro staff will have options available for consideration at the January 9th TPAC meeting for consideration.

TPAC is scheduled to take final action on a recommended list of projects at its January 30th meeting.

2010-13 RFF projects for consideration

Category	Tier	Project name	Bike/ped	Request (2012 dollars)
Regional mobility corridors	1st tier	NE/SE Twenties Bikeway: Lombard - Springwater Trail	X	$2,097,850
	2nd tier	Bus Stop Development & Streamline Program		$3,640,874
		Hogan/NE 242nd Dr: Glisan - Stark		$3,213,308
		Westside Trail: Kaiser Ridge Park - Kaiser Woods Park	X	$2,692,830
		Farmington Road at Murray Blvd Intersection		$4,002,099
		40 Mile Loop: Blue Lake Park - Sundial Rd	X	$2,322,421
	3rd tier	Kerr Parkway Bike Lanes: Stephenson - Boones Ferry Rd	X	$1,742,926
Mixed-use area implementation	1st tier	SW Rose Biggi: Hall - Crescent		$2,758,238
		102nd Ave: NE Glisan - SE Washington		$5,000,000
	2nd tier	McLoughlin Blvd: Clackamas River Bridge - Dunes Dr		$3,401,868
		Red Electric Trail: SW 30th - SW Vermont	X	$1,929,183
		N Fessenden/St Louis: Columbia Way - Lombard	X	$2,159,431
		Killingsworth: N Commercial - NE MLK Jr Blvd		$2,354,093
	3rd tier	SE Division: 6th - 39th		$2,500,000
	4th tier	OR 43: Arbor Dr - Marylhurst Dr	X	$3,800,097
Industrial & employment area implementation	1st tier	St Johns Rail Line (UP): N St Louis - N Richmond		$3,649,337
	2nd tier	Evergreen Rd: 253rd Ave - 25th Ave		$2,620,100
Environmental enhancement & mitigation	1st tier	School Bus Diesel Engine Emission Reduction		$2,047,050
	2nd tier	Electronic Mini-Hybrid Bus Retrofit		$1,345,950
	3rd tier	Transit Bus Diesel Engine Emission Reduction		$1,166,490
Project development		French Prairie Bridge: Boones Ferry Rd - Butteville Rd	X	$1,250,000
		Airport Way at 82nd Ave Intersection		$500,000
		SE 174th: Jenne - Giese		$222,500
		Council Creek Trail: Banks - Hillsboro	X	$448,650
		Willamette Greenway Trail: N Columbia Blvd - Steel Bridge	X	$444,800
		SE Division: 96th - 174th	X	$500,000
				$57,810,095

Geography

Regional	
City of Portland	
Clackamas County	
Multnomah County	
Washington County	

Target **$21,650,000**

Regional Flexible Fund | Technical Evaluation & Qualitative Summary

2010 – 2013 Metropolitan Transportation Improvement Program

September 2008

Metro | *Joint Policy Advisory Committee on Transportation*

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Metro | *Memo*

Date: 10/6/08

To: Interested parties

From: Ted Leybold, MTIP Manager

Re: 2010-13 RFF Allocation: approach to developing a final recommendation

Introduction

Projects submitted by local agencies for regional flexible funds have been evaluated on a technical basis using quantitative and qualitative analysis. Each project was reviewed for how well it meets the objectives for these funds as developed by JPACT and the Metro Council. The results of the evaluation are presented in this technical evaluation and qualitative summary document and the following table that lists each project and how they ranked relative to other projects in their solicitation category. The following describes how Metro technical staff and TPAC will use this information develop a final recommendation on a list of projects to receive funding:

1. Top Quantitative Score Projects within an evaluation category. The number of projects recommended for funding within each category depends on:
    a. clear break points in quantitative scores
    b. qualitative issues (described below)
    c. policy considerations (described below)

2. Qualitative issues associated with projects
    a. Prior commitments
    b. Links to other significant projects
    c. Affordable housing and school access
    d. Overmatch
    e. Economic impact and jobs benefit
    f. Environmental justice issues

3. Policy considerations relevant to the local project application pool:
    a. Ability to fund projects throughout the region
    b. Assure options to meet air quality requirements for construction of miles of bike (5 miles) and pedestrian (1.5 miles) facilities and a minimum of $7.2 million on those facilities.
    c. Project development:
        i. For large projects, ability to leverage other discretionary sources and funding strategy for future phases is in place
        ii. Construction phase likely to address program policy priorities and score well in quantitative evaluation
        iii. Appropriate project scope to project readiness and RTP planning goals and system needs

JPACT and the Metro Council will consider technical staff's recommendation and the public comments received to select the final list of projects.

2010-2013 Regional Flexible Fund - Step 2 Local Projects

	Project name	Agency	Request (2012 dollars)
Regional mobility corridors			
1st tier	**NE/SE Twenties Bikeway: Lombard - Springwater Trail**	City of Portland	$2,097,850
2nd tier	Bus Stop Development & Streamline Program	TriMet	$3,640,874
	Hogan/NE 242nd Dr: Glisan - Stark	City of Gresham	$3,213,308
	Westside Trail: Kaiser Ridge Park - Kaiser Woods Park	THPRD	$2,692,830
	Farmington Road at Murray Blvd Intersection	City of Beaverton	$4,002,099
	40 Mile Loop: Blue Lake Park - Sundial Rd	City of Fairview	$2,322,421
3rd tier	**Kerr Parkway Bike Lanes: Stephenson - Boones Ferry Rd**	City of Lake Oswego	$1,742,926
Mixed-use area implementation			
1st tier	SW Rose Biggi: Hall - Crescent	City of Beaverton	$2,758,238
	102nd Ave: NE Glisan - SE Washington	City of Portland	$5,000,000
2nd tier	McLoughlin Blvd: Clackamas River Bridge - Dunes Dr	City of Oregon City	$3,401,868
	Red Electric Trail: SW 30th - SW Vermont	Portland Parks	$1,929,183
	N Fessenden/St Louis: Columbia Way - Lombard	City of Portland	$2,159,431
	Killingsworth: N Commercial - NE MLK Jr Blvd	City of Portland	$2,354,093
3rd tier	SE Division: 6th - 39th	City of Portland	$2,500,000
4th tier	**OR 43: Arbor Dr - Marylhurst Dr**	City of West Linn	$3,800,097
Industrial and employment area implementation			
1st tier	St Johns Rail Line (UP): N St Louis - N Richmond	Port of Portland	$3,649,337
2nd tier	Evergreen Rd: 253rd Ave - 25th Ave	Washington County	$2,620,100
Environmental enhancement and mitigation			
1st tier	School Bus Diesel Engine Emission Reduction	DEQ	$2,047,050
2nd tier	Electronic Mini-Hybrid Bus Retrofit	TriMet	$1,345,950
3rd tier	Transit Bus Diesel Engine Emission Reduction	TriMet	$1,166,490
Project development			
	French Prairie Bridge: Boones Ferry Rd - Butteville Rd	City of Wilsonville	$1,250,000
	Airport Way at 82nd Ave Intersection	Port of Portland	$500,000
	SE 174th: Jenne - Giese	City of Gresham	$222,500
	Council Creek Trail: Banks - Hillsboro	City of Forest Grove	$448,650
	Willamette Greenway Trail: N Columbia Blvd - Steel Bridge	Portland Parks	$444,800
	SE Division: 96th - 174th	City of Portland	$500,000
		Total Requests	**$57,810,095**
		Available to Allocate	**$21,650,000**

Bike/pedestrian projects shown in **bold**
Minimum of $7.2 million to be allocated to bike/pedestrian projects

Note: tiers reflect clear break points between groups of projects with similar scores resulting from the quantitative analysis.

Regional Mobility Corridor Projects - Quantitative Summary

			Only one of these applies						
Project name	**I.a. Design element checklist (15 points max)**	**I.b. Gap or deficiency (25 points max)**	**I.c. V/C Ratio (25 points max)**	**I.d. Traffic analysis & CMP (25 points max)**	**I.e. Underserved or EJ population (5 points max)**	**I.f. Safety (20 points max)**	**I.g. Reduces emissions (5 points max)**	**I.h. funding limitations (5 points max)**	**Total points for project**
NE/SE Twenties Bikeway: NE Lombard - Springwater Trail	11	21	25	n/a	4	13.75	5	3	82.75
Bus Stop Development & Streamline Program	12	25	10	n/a	5	11.33	3	1	67.33
Hogan/NE 242nd Dr: Glisan - Stark	10	19	n/a	12	3	18.5	1	1	64.50
Westside Trail: Kaiser Ridge Park - Kaiser Woods Park	9	17	10	n/a	3	14.5	5	5	63.50
40 Mile Loop: Blue Lake Park - Sundial Rd	9	20	10	n/a	3	10.25	5	5	62.25
Farmington Road at Murray Blvd Intersection	7	22	n/a	19	2	11	1	1	63.00
Kerr Parkway Bike Lanes: Stephenson - Boones Ferry Rd	7	10	15	n/a	0	11.5	5	3	51.50

Mixed-use Area Implementation Projects

Project name	II.a. 2040 land use area (10 pts max)	II.b. design element checklist (20 pts max)	II.c. Land use narrative (20 pts max)	II.d. Population & employment (10 pts max)	II.e. Gaps & deficiencies (15 pts max)	II.f. Underserved populations (5 pts max)	II.g. Environmental justice (5 pts max)	II.h. Safety (10 pts max)	II.I. Environmental stewardship - Alt modes (5 pts max)	II.j. Limited funding source (5 pts max)	Total points for project
SW Rose Biggi: Hall - Crescent	10	9	17	7	15	4	5	7.75	3	5	82.75
102nd Ave: NE Glisan - SE Washington	10	11	15	8	15	3	5	5.75	5	3	80.75
McLoughlin Blvd: Clackamas River Bridge - Dunes Dr	10	15	16	2	10	2	0	7	3	5	70.00
Red Electric Trail: SW 30th - SW Vermont	5	10	14.5	4	13	3	0	9	5	5	68.50
N Fessenden/St Louis: Columbia Way - Lombard	5	10	15	6	7	3	5	9	5	3	68.00
Killingsworth: N Commercial - NE MLK Jr Blvd	5	8	18	5	7	5	5	4	3	5	65.00
SE Division: 6th - 39th	5	11	12.5	10	9	3	0	7	1	1	59.50
OR 43: Arbor Dr - Marylhurst Dr	5	8	7.5	2	14	0	0	6.25	5	3	50.75

Industrial and Employment Area Implementation Projects -Quantitative Summary

Project name	II.a. 2040 land use area (5 pts max)	II.b. Land use narrative (10 pts max)	II.c.Gap and deficiency (20 pts max)	II.d. Design element checklist (30 pts max)	II.e. Underserved populations (5 pts max)	II.f. Safety (10 pts max)	II.g. Environmental stewardship - Alt modes (5 pts max)	II.h. Limited funding source (5 pts max)	Total project points
St Johns Rail Line (UP): N St Louis - N Richmond	5	8.5	17	12	3	8.25	1	1	55.75
Evergreen Rd: 25th Ave - 253rd Ave	5	6	20	11	2	3.5	1	1	49.50

Environmental Enhancement and Mitigation Projects - Quantitative Summary

Emission reduction track

Project name	IV.a. 2040 land use area (5 pts max)	IV.b. Emission reduction for EJ (10 pts max)	IV.c. Total emission redux (60 pts max)	IV.d. Cost effectiveness (25 pts max)	Total project points
School Bus Diesel Engine Emission Reduction	N/A	10	60	21	91
Electronic Mini-hybrid Bus Retrofit	N/A	10	35	25	70
Transit Bus Diesel Engine Emission Reduction	N/A	10	13	12	35

Project Development - Qualitative Analysis

Project name	Project development criteria/factors	Qualitative analysis
French Prairie Bridge: Boones Ferry Rd - Butteville Rd	Solicitation category	Regional mobility corridors
	Addresses a gap or deficiency	Local TSP gap but not an RTP system gap in Ped/Bike/Trail system. Adjacent I-5 Boone Bridge deficient facility for peds & bikes crossing Willamette River but only facility between Oregon City and Newberg.
	Serves an underserved or environmental justice population	Bridge connects to elderly and disabled population (low)
	Supports modes that reduce emissions	Yes - project is a Bike/pedestrian bridge (high)
	Limited funding sources	Yes - project is a type that has limited or no other source of funds (high)
	Leverages discretionary funds	Will seek federal earmarks, RFF, Emergency Management, Fed/State Park Service and local sources for construction.
	Appropriateness of scope	No concerns
	Other considerations	Project intersects high value habitat area.
Willamette Greenway Trail	Solicitation category	Regional mobility corridors
	Addresses a gap or deficiency	Yes - project is designated in the RTP as a regional bike corridor and pedestrian
	Serves an underserved or environmental justice population	"Low - medium" elderly and disabled,"medium - high" low-income, minority & Hispanic, 4 EJ populations, significant very low-income, Black, Hispanic, American Indian/ Alaska Native (high)
	Supports modes that reduce emissions	Yes - project is a trail (high)
	Limited funding sources	Yes - project is a type that has limited or no other source of funds (high)
	Leverages discretionary funds	No
	Appropriateness of scope	No concerns
	Other considerations	Project intersects high value habitat area.

Project Development - Qualitative Analysis

Project name	Project development criteria/factors	Qualitative analysis
SE 174th: Jennie - Giese	Solicitation category	Mixed-use area implementation
	Addresses a gap or deficiency	Addresses gap in street network of Pleasant Valley concept plan.
	Serves an underserved or environmental justice population	"Very low" low-income, minority & hispanic and elderly and disabled populations, Significant Hawaiian and Pacific Islander (low)
	Supports modes that reduce emissions	No - is new road construction project. Has bike/ped/transit elements (low)
	Limited funding sources	No - project is not a type that has limited or no other source of funds (low)
	Leverages discretionary funds	Unknown
	Appropriateness of scope	No concerns
	Other considerations	Project intersects high value habitat area. Low to medium on land use narrative.
SE Division: 96th - 174th	Solicitation category	Mixed-use area implementation
	Addresses a gap or deficiency	Addresses gaps and deficiencies in pedestrian crossings of and .5 miles of sidewalk gaps on a Pedestrian transit/mixed-use corridor. Addresses deficiencies by improving transit stops on a Frequent Bus corridor.
	Serves an underserved or environmental justice population	Significant Black, Asian, Hawaiian/Pacific Islander, American Indian/Alaska Native, Non-English speaking, 3 environmental justice populations. "Low - medium" elderly and disabled, mostly "low" low-income, minority & Hispanic (high)
	Supports modes that reduce emissions	Yes - streetscape improvements focused on pedestrian and bike safety and access, transit improvements (medium)
	Limited funding sources	Yes - project is a type that has limited or no other source of funds (high)
	Leverages discretionary funds	May leverage overmatch in an initial construction phase as $584,000 of SDC funds remain available for project.
	Appropriateness of scope	No concerns
	Other considerations	Medium to high on land use narrative.

Project Development - Qualitative Analysis

Project name	Project development criteria/factors	Qualitative analysis
Airport Way at 82nd Ave Intersection	Solicitation category	Industrial & employment area implementation
	Addresses a gap or deficiency	Not a current deficiency
	Serves an underserved or environmental justice population	Significant Black, American Indian/Alaska Native. "Medium" low-income, minority, Hispanic, "very low" elderly and disabled. 2 EJ populations (medium)
	Supports modes that reduce emissions	No - grade seperated intersection construction project (low)
	Limited funding sources	No - project is not a type that has limited or no other source of funds (low)
	Leverages discretionary funds	Port Operational Revenues
	Appropriateness of scope	Inconclusive priority for project without resolution of I-205/Airport Way interchange design.
	Other considerations	Interchage spacing may require braided ramps, increasing project complexity and cost. Medium to high on land use narrative.
Council Creek Trail: Banks - Hillsboro	Solicitation category	Regional mobility corridors
	Addresses a gap or deficiency	Urban portion addresses trail system gap.
	Serves an underserved or environmental justice population	"Low" elderly and disabled, "low-medium" low-income, minority & Hispanic, Significant American Indian/Alaska Native, Hispanic and non-english speaking. 3 EJ populations (medium)
	Supports modes that reduce emissions	Yes - trail project (high)
	Limited funding sources	Yes - project is a type that has limited or no other source of funds (high)
	Leverages discretionary funds	No
	Appropriateness of scope	No concerns
	Other considerations	Project intersects high value habitat area and wildlife mortality hotspot - low priority area

Regional Mobility Corridor Projects -Qualitative Summary

NE/SE Twenties Bikeway: NE Lombard to Springwater Trail	Past regional commitment	No past regional commitments.
	Linked to other project	The project will fill the gap in the north-south bikeway network and will leverage the benefits of recently completed east-west bikeways like Lombard, Tillamook, Ankeny, and Salmon-Taylor.
	Multi-modal benefit	The project will improve the multi-modal character of the corridor, benefit pedestrians with improved crossings and curb extensions, and create traffic calming that benefits the neighborhood.
	Overmatch	No
	Affordable housing/safe school	The bikeway passes within one half mile of nineteen schools and 12 of the 17 adjacent census tracts to the bikeway have a higher percentage of low-income residents than the regional average.
	Economic impact/jobs	The bikeway corridor connects several places identified as strategic areas in the Regional 2040 Growth Concept, including main streets, corridors, station communities and industrial areas. In addition, the bikeway will connect to industrial areas, such as the Brooklyn Yard, and future station communities along the Portland-Milwaukie light rail line.
	Project readiness	Some segments had generic design treatments submitted - needs further refinement.
	Other considerations	N/A
Bus Stop Development & Streamline Program	Past regional commitment	No past regional commitment.
	Linked to other project	Corridors and improvements sites have been defined per TriMet's Transit Investment Plan (TIP) and are linked to service imrovements and identified safety access issues.
	Multi-modal benefit	Enhancement of bus stops will provide more incentive and opportunities for people to choose transit for their trips. In addition, improvements to bus stop locations and access will include sidewalk improvements in targeted locations, encouraging pedestrian activity.
	Overmatch	No
	Affordable housing/safe school	No information provided.
	Economic impact/jobs	No information provided.
	Project readiness	No concerns
	Other considerations	N/A

Regional Mobility Corridor Projects -Qualitative Summary

Hogan/NE 242nd Dr: Glisan - Stark	Past regional commitment	No past regional commitments.
	Linked to other project	Project completes street improvements in 242nd Avenue corridor between US 26 and I-84, including new improvements on south end of corridor.
	Multi-modal benefit	The project will install sidewalk and bike path features, including a 10-foot shared use path and pedestrian-scale lighting, that are in excess of what's required by state law. The project will also provide multi-modal benefit for freight through a center turn lane.
	Overmatch	Yes. A $500,000 match, which is about 13.5%.
	Affordable housing/safe school	By creating a new shared use path, a new bicycle lane, pedestrian refuges, and improving an existing sidewalk the project will provide increased safety for students walking and biking to the one of four schools in a one-mile radius of the project. Also, there are two affordable housing developments within a quarter mile of the project.
	Economic impact/jobs	The corridor is near existing industrial firms and areas zoned light industrial available and business park available. All of this property is designated by Metro for employment or industry.
	Project readiness	No concerns
	Other considerations	N/A
Westside Trail: Kaiser Ridge Park - Kaiser Woods Park	Past regional commitment	No past regional commitment.
	Linked to other project	The proposed project will connect to an existing section of the Rock Creek Regional Trail and continue development of the corridor following on construction of segments #7 - #11 of the Westside Regional Trail.
	Multi-modal benefit	Application says there are no multi-modal improvements beyond what has already been identified previously in this application.
	Overmatch	No
	Affordable housing/safe school	The project may have a link in providing an off-street option for parents and school children living in close proximity to the project area as Jacob Wismer Elementary School and Stoller Middle School are both located within 1/4 mile of the proposed trail.
	Economic impact/jobs	The project is not expected to have any direct impact on economic development or job creation. But the trail may provide a transportation alternative to those individuals who may live and work in close proximity to the project area.
	Project readiness	Westside Trail master plan that will identify project development issues is not yet completed.
	Other considerations	Project intersects high value habitat area and wildlife mortality hotspot. West Union Road, the south terminus of the project, has no bike or pedestrian facilities to provide access to the trail.

Regional Mobility Corridor Projects -Qualitative Summary

40 Mile Loop: Blue Lake Park - Sundial Rd	Past regional commitment	No past regional commitment.
	Linked to other project	The project is linked to the construction of the eastern section of the 40-Mile Loop Trail between Sundial and Graham Road as part of the development of the Troutdale Reynolds Industrial Park.
	Multi-modal benefit	The project provides more opportunities for bicycle and pedestrian options as the Port of Portland property develops and future connections to new developments and streets in the Troutdale Reynolds Industrial Park.
	Overmatch	No
	Affordable housing/safe school	No direct benefits to schools or affordable housing.
	Economic impact/jobs	There are no known direct beneficial economic impacts other than through design and construction of the project. Long term indirect impacts are expected in relation to the trail as a commuter and recreation trail providing attractive benefits and amenities to area businesses and residents.
	Project readiness	Utilities, none provided, but "can be." Sheet flow - checking with agencies. Approval to build on levee required.
	Other considerations	Project intersects wildlife mortality hotspot - low priority area.
Farmington Road at Murray Blvd Intersection	Past regional commitment	The preliminary engineering phase was funded through the MTIP and 90% plans are complete.
	Linked to other project	No direct links to other regional projects.
	Multi-modal benefit	Through improvements like wider sidewalks, marked crossings, pedestrian refuges, signal improvements, lighting, and medians, the project will provide a direct multi-modal connection to the Beaverton Regional Center with its Westgate site, The Round and Beaverton Central MAX station, the Beaverton Transit Transfer, MAX light rail, and Commuter Rail Stations.
	Overmatch	No
	Affordable housing/safe school	Within the project area there is a school and two assisted living facilities. The project is also identified as a positive improvement serving Minority Race and Hispanic Origin Populations and Low Income Populations.
	Economic impact/jobs	Economic benefits of improving Farmington Road are time savings realized by businesses and worker commuter trips by reducing traffic congestion; improved freight commodity flows and production schedules, Enhanced tourist travel industry, and improved access and traffic flow for local businesses and potential businesses.
	Project readiness	No concerns
	Other considerations	N/A

Regional Mobility Corridor Projects -Qualitative Summary

Kerr Parkway Bike Lanes: Stephenson - Boones Ferry Rd	Past regional commitment	No past regional commitments.
	Linked to other project	No specific projects mentioned.
	Multi-modal benefit	Project is for one modal improvement.
	Overmatch	Yes. $ 300,000, or 15%. Applied for TE funding as potential source of overmatch.
	Affordable housing/safe school	The proposed project will provide a safer route to connect to PCC and Lake Oswego High School.
	Economic impact/jobs	No specific benefits mentioned aside from overall improvement in the quality of life.
	Project readiness	No concerns
	Other considerations	Project intersects high value habitat area.

Mixed-use Area Implementation Projects - Qualitative Summary

SW Rose Biggi: Hall - Crescent	Past regional commitment	The project was funded for preliminary engineering with regional funding and is included as STIP Key #14400.
	Linked to other project	The project is connected to recent infrastructure and development projects at The Round site such as Rose Biggi phase I, Crescent, Beaverton Round, Commuter Rail, Light Rail, which have received federal funding through the MTIP. In addition, this project is connected to the Westgate site and potential local purchase of Westgate Drive.
	Multi-modal benefit	The project fills a multimodal gap in the Regional Center circulation and access system and increases the safety for bicycles and pedestrians to directly access the Westgate TOD site, the Round, Beaverton Central MAX Station, light rail and commuter rail.
	Overmatch	No
	Affordable housing/safe school	The project will enhance pedestrian and bicycle access to the Beaverton School District Arts and Communication High School and the area North of Hall Boulevard contains some affordable housing opportunities.
	Economic impact/jobs	The project will allow for the construction of a connection that will stimulate economic development around the Beaverton Round and the Westgate Site, which will benefit the local economy by creating jobs. The project provides the site access that will promote job creation and economic vitality in the center.
	Project readiness	Stormwater treatment adjacent to creek to be addressed in PE.
	Other considerations	N/A

Mixed-use Area Implementation Projects - Qualitative Summary

102nd Ave: NE Glisan - SE Washington	Past regional commitment	Phase I of the project received two RFF allocations, one for preliminary engineering and one for Right of Way.
	Linked to other project	Extends Phase I project currently under construction south.
	Multi-modal benefit	Project improves pedestrian, bike and transit modes.
	Overmatch	Yes. 18.3%
	Affordable housing/safe school	The project would provide a sidewalk improvement in an area with a significant percentage of low-income housing.
	Economic impact/jobs	No direct relationship to economic impacts.
	Project readiness	No concerns
	Other considerations	N/A
McLoughlin Blvd: Clackamas River Bridge - Dunes Dr	Past regional commitment	No past regional commitment.
	Linked to other project	Would extend boulevard treatment under construction further north.
	Multi-modal benefit	The project itself provides better mobility for pedestrians and bicyclists, but the application does not specify any additional multi-modal benefit. Without the project, other multi-modal improvements would not prevail. Oregon City is the primary lead to improve the multi-modal characteristics of this section of McLoughlin.
	Overmatch	Yes. 20.3%
	Affordable housing/safe school	N/A
	Economic impact/jobs	The project would significantly encourage development by upgrading the condition of the street system and providing a comfortable space for pedestrians, bicyclists, transit users, and motorists. In the project area, Oregon City is currently working with that will provide a total of 1877 jobs, some direct through construction and some indirect. Land use score based on forecast may be low if proposed development occurs. Geographic barriers appear to be a factor in the low score for the project on population and employment given the methodology did not take these into account.
	Project readiness	Archeological, 4(f) historic impacts to be addressed in PE.
	Other considerations	Project intersects high value habitat area.

Mixed-use Area Implementation Projects - Qualitative Summary

Red Electric Trail: SW 30th - SW Vermont	Past regional commitment	No past regional commitment.
	Linked to other project	The project will connect to improvements made on SW Capitol Highway in Hillsdale Town Center and the ODOT Iowa structure (I-5) replacement project and the SW Barber Boulevard repaving.
	Multi-modal benefit	The trail project will provide an east-west crossing in Southwest Portland for pedestrians and bicyclists.
	Overmatch	No.
	Affordable housing/safe school	The trail project will help provide safe transportation for students at Wilson High School, Reike Elementary School, and Gray Middle School.
	Economic impact/jobs	The project has no direct economic impacts aside from providing better multi-modal access to any projects in the Hillsdale Town Center that BOP study hopes to catalyze.
	Project readiness	Potential wetland impacts to be addressed in PE.
	Other considerations	N/A
N Fessenden/St Louis: Columbia Way - Lombard	Past regional commitment	No past regional commitment.
	Linked to other project	The first phase of the project received funding in the 2004-2007 RFF cycle for design engineering and construction. The project is connected to the redesign of the Columbia/Portland Road intersection (PE funded in 2007) and to the project to reconstruct the Burgard Bridge, which address other deficiencies of the Columbia Blvd freight route.
	Multi-modal benefit	Pedestrian and transit benefits.
	Overmatch	No.
	Affordable housing/safe school	The project will improve the safety of access to two schools in the area, George Elementary and Roosevelt High School, through crossing improvements.
	Economic impact/jobs	No information provided.
	Project readiness	No concerns
	Other considerations	N/A

Mixed-use Area Implementation Projects - Qualitative Summary

Killingsworth: N Commercial - NE MLK Jr Blvd	Past regional commitment	The project received an RFF allocation for $400,000 for design in the 2008-2011 RFF cycle.
	Linked to other project	The three significant/relevant projects include phase one of this same project, improvements from N Interstate to N Commercial, ODOT funding of sidewalk improvements on the Killingsworth Bridge, and PCC Cascade Campus funded Killingsworth street improvements.
	Multi-modal benefit	No information provided.
	Overmatch	Yes. 25% for project construction.
	Affordable housing/safe school	There are affordable housing opportunities located close to the project area including Iris Court Cluster and Killingsworth Station as well as two schools, Humboldt Elementary and Jefferson High School, which both have majority of African American and low-income enrollments.
	Economic impact/jobs	The streetscape improvements from Interstate to Commercial and the leveraged investment of PCC in the Cascade Campus has helped catalyze small business and retail growth in the project area. In addition, PDC has provided certain programs to catalyze development and growth in the project area such as Development Opportunity Services, Storefront Improvement Program, and small business loans.
	Project readiness	No concerns
	Other considerations	N/A

Mixed-use Area Implementation Projects - Qualitative Summary

SE Division: 6th - 39th	Past regional commitment	The project received an RFF allocation of $2.5 million in 2002, during the Priorities 2004-2007 process.
	Linked to other project	The project will complement BES' stormwater and sewer improvements in the project area/Taggert-D basin that will include opportunities for constructing stormwater facilities.
	Multi-modal benefit	The project's streetscape improvements and enhanced transit access will promote all modes that travel along Division.
	Overmatch	Yes. 68%.
	Affordable housing/safe school	Since the project area includes three neighborhood schools the transportation and streetscape improvements will enhance access and transportation to the schools.
	Economic impact/jobs	The infrastructure and streetscape improvements is part of the development of Division as a Main street and green street. Revitalizing the infrastructure surrounding the commercial nodes along Division will help create opportunities for economic development and private investment.
	Project readiness	No concerns
	Other considerations	Project intersects wildlife mortality hotspot - low priority area
OR 43: Arbor Dr - Marylhurst Dr	Past regional commitment	No past regional commitment.
	Linked to other project	No information provided.
	Multi-modal benefit	The project will increase pedestrian and bicycle mobility along the project corridor.
	Overmatch	No.
	Affordable housing/safe school	The project improves pedestrian and bike transportation to Marylhurst University, which is at the northern edge of the project area.
	Economic impact/jobs	None.
	Project readiness	No concerns
	Other considerations	Project intersects high value habitat area and wildlife mortality hotspots - medium to low priority area

Industrial and Employment Area Implementation Projects - Qualitative Summary

St Johns Rail Line (UP): N St Louis - N Richmond	Past regional commitment	No previous regional commitments.
	Linked to other project	The project is linked to the expansion of the St Johns lead by UP to construct the rail adjacent to terminal 4 and increase train capacity. Also significant is the terminal pipeline infrastructure project.
	Multi-modal benefit	The first phase of the project will separate train traffic from other modes of travel within Bradford Street.
	Overmatch	Yes. 40.7%
	Affordable housing/safe school	No information provided
	Economic impact/jobs	Project supports businesses at Terminal 4.
	Project readiness	"Whistle free zone" is element in the Cathedral Park Master planning effors and UP supports the rail realignment.
	Other considerations	N/A
Evergreen Rd: 25th Ave - 253rd Avenue	Past regional commitment	No previous regional commitments.
	Linked to other project	Project complemented by other collector improvements in area: Huffman Road extension, 253rd frontage improvements.
	Multi-modal benefit	No multi-modal benefit mentioned except improving access to the Hillsboro airport.
	Overmatch	No.
	Affordable housing/safe school	No link to affordable housing or safe school access.
	Economic impact/jobs	The project is increasing mobility in an area that is has experienced economic growth and mobility is important to the continued growth of the area in the future.
	Project readiness	No concerns
	Other considerations	Project intersects wildlife mortality hotspot - high priority area

Environmental Enhancement and Mitigation Projects - Qualitative Summary

Transit Bus Diesel Engine Emission Reduction	Past regional commitment	The 2008-2011 adopted MTIP includes $1,000,000 for the installation of the same technology (continuously regenerating traps) for buses.
	Linked to other project	The project complements all existing bus and transit service improvements.
	Multi-modal benefit	The project will improve air quality for pedestrians and bicyclists using the roads with the buses.
	Overmatch	No.
	Affordable housing/safe school	No information provided.
	Economic impact/jobs	No information provided.
	Project readiness	No concerns
Electronic Mini-hybrid Bus Retrofit	Past regional commitment	The technology requested is new and has not yet been the focus of a regional funding request.
	Linked to other project	The project complements all bus and transit service improvements.
	Multi-modal benefit	The project will improve air quality for pedestrians and bicyclists using the roads with the buses.
	Overmatch	No.
	Affordable housing/safe school	No information provided.
	Economic impact/jobs	No information provided.
	Project readiness	No concerns
School Bus Diesel Engine Emission Reduction	Past regional commitment	No past regional commitment.
	Linked to other project	Not linked to previous projects.
	Multi-modal benefit	The school buses eliminate the parent driven vehicle miles to get kids to school.
	Overmatch	Yes. 38.7%.
	Affordable housing/safe school	School buses provide a safe way to transport children to school.
	Economic impact/jobs	The providers of this diesel engine technology will likely be locally-based diesel engine repair facilities, which will help this growing local industry.
	Project readiness	No concerns

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Metro | *Memo*

Date: January 9, 2009

To: Transportation Policy Alternatives Committee & Interested Parties

From: Deena Platman, Principal Transportation Planner

Re: Regional Transportation System Management & Operations (TSMO) Plan Update

Background

Metro was awarded a Transportation and Growth Management Grant to conduct a refinement planning process for regional transportation system management and operations (TSMO). The planning effort was deemed necessary in order to develop a comprehensive understanding of how system management and operations opportunities can help the region address its transportation challenges and to develop a regional vision and strategy for implementing TSMO. The plan is being developed in collaboration with the 2035 Regional Transportation Plan (RTP). Its vision, goals, and strategies will be incorporated into the state component of the 2035 RTP. The project goals include:

- Refining the *2035 RTP* goals, objectives and actions related to system management;
- Developing policy direction on where, when, and how TSMO strategies are applied and financed in the region;
- Enhancing the region's capacity to consider TSMO in concert with more traditional capital projects;
- Prioritizing TSMO projects for regional funding;
- Actively facilitating communication between interested stakeholders with diverse perspectives on TSMO.

Technical Team and Advisory Committees

The project greatly benefits from a seasoned consultant team lead by DKS Associates, which includes assistance from Kittelson & Associates, Angelo Planning, and Jeanne Lawson & Associates.

TransPort, the TPAC subcommittee for system management and operations, provides technical expertise to the planning effort. This includes initial input and review of work products with a particular focus on the TSMO toolbox, needs assessment, and action plan of TSMO priorities. TransPort provides input at both its monthly meetings and between meetings. TransPort will make plan recommendations to TPAC.

The TSMO Policy Work Group provides policy level input into the plan development. Members will review and comment on work products prepared by Metro and the consultant team and help guide plan recommendations that will be brought forward to TransPort, TPAC, JPACT, and Metro Council. The work group is comprised of representatives from public and private organizations with a stake in effective management and operation of the transportation system. A roster of members is provided in Attachment A. Tom Kloster, Metro Transportation Planning Manager, chairs the work group meetings. The work group will meet up to six times over the course of the planning project. The group held their first meeting on November 24, 2008. The group meets again on January 26, 2009.

Major Tasks and Timeline
The Regional TSMO Refinement Plan project officially kicked off in early September 2008 and is anticipated to be completed by August 31, 2009. Attachment B provides a timeline of major tasks and activities.

Following is a list and brief description of the major tasks to be completed.

- TSMO Vision, Goals and Objectives – Develop a clear vision with supporting goals and measurable objectives for the implementation of TSMO strategies in the Portland metropolitan region.
- TSMO Toolbox – Create an information resource with a menu of options that stakeholders can easily understand and can serve as an "idea kit" for identifying solutions.
- Regional TSMO Needs Assessment – Create and implement a methodology for assessing TSMO needs across the region.
- TSMO Finance – Identify issues and strategies for financing TSMO strategies in the region.
- TSMO Action Plan – Develop and implement a process to identify a set of prioritized TSMO projects that can be incorporated into the 2035 RTP and funded using the MTIP programmatic funds for TSMO.
- 2035 RTP Products – Prepare amendments to the 2035 RTP and the 2010-2013 MTIP as needed; could include revisions to policy and system investment list.
- ITS Architecture Update – Update the current regional Intelligent Transportation System (ITS) Architecture document as needed to accommodate revised and new strategies identified in the planning process.
- Plan Document – Document the TSMO planning process through a compilation of all final products.
- Plan Adoption – Approval by JPACT and the Metro Council.

Accomplishments to Date
The project is on-schedule and some of the initial products are under review by the advisory committees.

TSMO Vision, Goals and Objectives
Attachment C includes the latest version of the TSMO vision, goals, and objectives. TransPort developed the initial vision and goals over several meetings and the TSMO Policy Work Group provided detailed input as well. At its January 9th meeting, TPAC will be asked to comment on the draft language.

TSMO Toolbox
Attachment D is the TSMO Toolbox memorandum prepared by Kittelson and Associates. TransPort provided extensive comments on the development of this toolbox in addition to research of other national and international examples conducted by the consultant.

Needs Assessment Methodology
Attachment E is the TSMO needs assessment methodology memorandum, which describes the process for identifying system needs. The project team is well underway with implementing the process, working in coordination with TransPort to secure needed data.

Attachment A

Regional Transportation System Management and Operations Refinement Plan

Transportation System Management & Operations (TSMO) Policy Work Group Roster

Work Group Member		Affiliation
Tom	Clemo	Tualatin Valley Fire and Rescue
Marie	Dodds	AAA
Patty	Fink	Coalition for a Livable Future
Bob	Hart	SW RTC
Eric	Hesse	TriMet
Karla	Keller	ODOT – Region 1
Bill	Kloos	City of Portland - Operations
Tom	Kloster	Metro - Chair
Jay	McCoy	City of Gresham
Jane	McFarland	Multnomah County
Galen	McGill	ODOT - Salem
Margaret	Middleton	City of Beaverton
Louis	Ornelas	TPAC Citizen Member
Wilda	Parks	North Clackamas Chamber of Commerce
Pam	Peck	Metro
Nathaniel	Price	FHWA
John	Reinhold	TPAC Citizen Member
Bob	Russell	Oregon Trucking Association
Paul	Smith	City of Portland - Planning
Tom	Tushner	Washington County
Ron	Weinman	Clackamas County
Technical Team		
Deena	Platman	Metro – Project Manager
Josh	Naramore	Metro – Associate Planner
Jim	Peters	DKS Associates – Consultant/Manager

Attachment B

Regional Transportation System Management and Operations Refinement Plan

Timeline of Major Tasks

Month	Major Tasks								
Sept 08	Task 1: Public Participation & Technical Coordination	Task 2: Regional TSMO Vision Policy WG #1	Task 3: TSMO Toolbox						
Oct 08				Task 4: TSMO Needs Assessment					
Nov 08					Task 5: Finance				
Dec 08									
Jan 09				Policy WG #2		Task 6: TSMO Action Plan			
Feb 09									
Mar 09					Policy WG #3				
Apr 09									Task 9: TSMO Refinement Plan (If needed) Policy WG #5 Policy WG #6
May 09						Policy WG #4		Task 8: ITS Arch. Update	
Jun 09							Task 7: RTP Products		
Jul 09									
Aug 09									

Role of Transport: Provides technical expertise to the planning effort; has initial input and review of work products with a particular focus on technical aspect such as the TSMO toolbox, needs assessment, and prioritization criteria. TransPort will provide input at its monthly meetings for the duration of the project. TransPort makes recommendations to TPAC, JPACT, and Metro Council.

Role of TSMO Policy Work Group: Provides policy level input; reviews and comments on work products and guides recommendations to TransPort, TPAC, JPACT, and Metro Council. The TSMO Policy Work Group will meet up to six times during the project.

1/9/08 - TPAC

Attachment C

DKS Associates
TRANSPORTATION SOLUTIONS

DRAFT MEMORANDUM

DATE: December 30, 2008

TO: TransPort

FROM: Jim Peters, P.E., P.T.O.E.
Jennifer Bachman
Renee Hurtado, P.E.

SUBJECT: **Draft Regional TSMO Vision** P06097-013-002

This draft memorandum summarizes the regional vision, goals and objectives of the Regional Transportation System Management and Operations plan. The vision and goals were developed through input from the Technical Advisory Committee (TAC) and were refined by the Policy Work Group.

Vision Statement

During the October 8, 2008 TAC meeting the following list of key ideas was developed for incorporation into the vision statement:

- move people and goods
- system predictability, reliability and efficiency
- multi-modal
- reduce traffic crashes
- green/sustainable
- coordinated regional response
- comprehensive real-time/forecasted traveler information
- measure performance
- active management/monitoring of the transportation system
- support the economy (cost effectively)
- coordinated and cooperative regional transportation operations

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From that list, the following draft vision statement was developed:

> The Portland metropolitan region will collaboratively and proactively manage its multimodal transportation system to ensure safe, reliable, efficient, and equitable mobility for people and goods. The region will strive to be a nationally recognized leader for innovative management and operations of its system.

Goals and Objectives - Guiding Principles and Aims

Four goals and three guiding principles encompass the key ideas expressed by the TAC members.

Objective targets are based on a 2020 target date.

Goal 1: Provide reliable travel times for people and goods movement.

Objectives:

- Reduce vehicle delay to maintain a travel time index of 1.20 or less on freeways and major arterials. Travel time index is the ratio of travel time during peak hours versus travel time during free flow conditions.
- Maintain a planning index time (95^{th} Percentile travel time divided by the free flow travel time) of 1.6 or less on arterials and freeways.
- Maintain a buffer index of 15% or less.

Goal 2: Enhance transportation safety and security for all modes.

Objectives:

- Reduce the vehicle crash rate by XX%.
- Reduce construction, weather and incident related delay
- Reduce secondary crashes by 30%.
- Reduce pedestrian and bicycle crash rate by 30%.

Goal 3: Support an environmentally, economically, and socially sustainable and efficient transportation system for all communities.

Objectives:

- Increase transit ridership by 5% annually.
- Improve connections between modes (e.g. auto to transit, bike to transit).
- Reduce CO_2 vehicle emissions and fuel consumption by 10%.
- Increase person carrying capacity within mobility corridors by 20%.
- Reduce VMT per capita by 10%.
- Increase pedestrian and bicycle commuters by 5% annually.

Goal 4: Provide comprehensive multimodal traveler information to people and businesses.

Objectives:

- Provide traveler information within five minutes of any major network changes.
- Provide forecasted traffic condition information.
- Provide comprehensive pre-trip and en-route traveler information.
- Provide personalized traveler information.

Guiding Principle 1: Enhance regional partnerships that support collaborative investment and implementation of management and operations strategies that benefit the region.

Aims:

- Develop (or update) a concept of operations for appropriate TSMO projects.
- Maintain and update ITS Architecture.
- Continue TransPort activities and engaging participants from all agencies.
- Incorporate regional involvement in developing, operating and implementing the regional transportation system.

Guiding Principle 2: Monitor transportation system performance and evaluate system management strategies to aid equitable policy and sustainable investment decisions.

Aims:

- Include a reliable data collection component and a method to retrieve that data with all projects to measure the effectiveness of the project (performance measurement).
- Issue regular summaries of available data and performance measurement.
- Store system management and operations data in one central data warehouse.
- Implement projects that generate positive returns on investment.

Guiding Principle 3: Provide on-going maintenance and operations to support the transportation network.

Aims:

- Identify and implement a resource plan for projects.
- Share resources to optimize maintenance and operation responsibilities.

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TECHNICAL MEMORANDUM

Metro Regional Transportation System Management and Operations Refinement Plan

TSMO Strategy Toolbox

Date: December 10, 2008 Project #: 9221

To: Jim Peters, P.E., DKS & Associates, Inc.

From: Peter Koonce, P.E. and Shaun Quayle, P.E.

cc: Deena Platman, Metro

1.0 INTRODUCTION

The purpose of this memorandum is to describe the TSMO strategies used nationally and internationally. The description of the strategies is organized in a simple to read format with information on each strategy. This menu is an information resource that stakeholders can use to identify strategies for implementation. This menu presents options which support the TSMO vision, goals, and objectives. This menu of strategies will also be referred to as a TSMO "toolbox", because from it we will build the next phases of this project, such as needs assessment, financing, and action plan.

At the first technical advisory committee (TAC) meeting, the past, present, and future of TSMO and ITS was discussed. This exercise allowed the TAC members to appreciate how far TSMO and ITS have come in a relatively short period while at the same time, thinking about the future possibilities. For example, ITS within the region 10 years ago was a few CCTV cameras on a website and fixed time ramp meters. Today, ramp meters are based on traffic demand, the website has incident reports, real-time speed data, and weather reports. The region's TSMO and ITS infrastructure has grown significantly over the last 10 years, and more substantial growth is expected over the next 10 years as political and cultural awareness of the need to operate and maintain the existing system increases, potentially along with funding. This plan will provide the direction for this TSMO regional growth.

2.0 TSMO FRAMEWORK & STRATEGIES OVERVIEW

The TSMO toolbox or menu of strategies is an information resource allowing the reader to easily find TSMO strategies, definitions, and details such as benefits, estimated costs, and political, institutional, and technical factors. These three factors influence the application and appropriateness of a treatment given a particular situation. This menu of strategies is meant to highlight the key state-of-the-practice TSMO strategies as a starting point for customizing a plan to suit the region. It should be noted there is overlap between many of the strategies, thus the framework could be set up to follow a number of configurations. The project team decided to follow a framework established by FHWA in their report, *Traffic Congestion and Reliability: Linking Solutions to Problems,* which grouped strategies by user and facility. These are arterial/freeway for pedestrians, bicycles, and automobiles; transit, and freight. The menu of strategies for this report follows this grouping.

Table 1 is a quick summary of the TSMO strategies outlined in this menu, which will help point the reader to strategies he or she is most interested in for greater detail in the next section of the memorandum. These strategies are hyperlinked to the appropriate page in the document. Abbreviations are used to represent the type of application in this summary table.

- A: arterial strategy,
- F: freeway strategy,
- AF: arterial/freeway strategy,
- FR: freight strategy, and
- T: transit strategy.

The estimated cost range in Table 1 generally refers to the following:

Low = less than $200,000

Medium = greater than $200,000, but less than $1 million

High = greater than $1 million

It should be noted that these cost ranges are largely dependent on the size, complexity, and extent of the project. For example, HOV lanes are relatively inexpensive to develop if they use existing pavement and right-of-way, but are very expensive if they involve building new infrastructure. Another good example is transit signal priority, which was applied by the City of Portland several years ago. Transit signal priority is a relatively low cost application if applied at 5-10 intersections, but the nearly citywide application of 250 intersections involved significant infrastructure investments such as modifying the standard traffic signal controller software and the bus Automatic Vehicle Location (AVL) system, resulting in a total project cost of $4.5 million. The range is appropriate because the costs listed in this toolbox are estimates.

Table 1 Summary of TSMO Strategies

Number	TSMO Strategy	Key Benefit(s)	Estimated Cost Range
A1	Access Management	Improved Mobility & Safety	Low (unless access rights or property to be purchased)
A2	Advanced Signal Systems	Reduced Congestion	Medium-High
A3	Changeable Lane Assignments	Reduced Congestion	Low
A4	Signal Retiming / Optimization	Improved Mobility	Low
A5	Red Light Cameras	Improved Safety	Medium
A6	Parking Management	Improved Mobility	Low
AF7	Active Traffic Management	Improved Mobility	Low-Medium
AF8	Event Management	Reduced Congestion	Low-Medium
AF9	Integrated Corridor Management	Improved Mobility	Medium
AF10	Real-Time Traveler Information	Improved Mobility	Low (if little added infrastructure), High (if added infrastructure)
AF11	Real-Time Traffic Data Collection using Private GPS Data	Improved Mobility	Low
AF12	Vehicle Infrastructure Integration	Improved Mobility & Safety	High
AF13	Automated Speed Enforcement	Improved Safety	Medium-High
AF14	Traffic Surveillance	Improved Mobility	Low
AF15	Emergency Management	Improved Safety	Varies depending on system complexity
F16	Incident Management	Improved Mobility & Safety	Low
F17	Work Zone Management	Improved Mobility & Safety	Low (if little added infrastructure), High (if added infrastructure)
F18	High Occupancy Vehicle/Toll Lanes	Improved Mobility	Low (if restriping/signing), High (if new construction)
F19	Reversible Lanes	Reduced Congestion	Medium-High
F20	Lane Controls / Temporary Shoulder Use	Reduced Congestion	Medium-High
F21	New Toll Roads / Congestion Pricing	Improved Mobility	High
F22	Electronic Toll Collection	Reduced Congestion	High
F23	Road Weather Information Systems	Improved Safety	Low-Medium
F24	Bottleneck Removal	Reduced Congestion	Medium-High
F25	Ramp Closures	Improved Mobility & Safety	Low
F26	Ramp Metering	Reduced Congestion	Low-Medium
F27	HOV Ramp Bypass	Improved Mobility	Low (if restriping/signing), High (if new construction)
F28	Transportation Management Center	Improved Mobility & Safety	High
F29	Variable Speed Limits	Reduced Congestion & Safety	Low-Medium

FR30	Real-Time Freight Information	Improved Mobility	Low
FR 31	Roadside Electronic Screening / Clearance Programs	Improved Mobility & Safety	Medium-High
FR32	Truck Only Lanes	Improved Mobility & Safety	Low (if restriping/signing), High (if new construction)
FR 33	Truck Signal Priority	Improved Mobility	Low
FR 34	Vehicle Tracking (Automatic Vehicle Location (AVL))	Improved Mobility	Low
T35	Park and Ride Lots	Reduced Congestion	Medium-High
T36	Real-Time Transit Information	Improved Mobility	Medium-High
T37	Transit Signal Priority	Improved Mobility	Low
T38	Transit Only Lanes / Transit Queue Jump	Improved Mobility	Low (if restriping/signing), High (if new construction)
T39	Vehicle Tracking (Automatic Vehicle Location (AVL))	Improved Mobility	Low

3.0 TSMO MENU OF STRATEGIES (TOOLBOX)

3.1 Arterial/Freeway Strategies

This section describes the menu of strategies for TSMO involving surface roadways (arterials) and freeways. It should be noted where strategies typically overlap, the designation AF, for arterial/freeways is used.

3.1.1 – Access Management (A1)

Description: Access Management is the process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed.

Example Strategy Applications:

- Shared or consolidating access points
- Restricting access point movements (medians, channelized movements)
- Closing access points

Potential Benefits:

- Reduction in crashes and crash rates
- Increased capacity, vehicle flows and speeds
- Less conflict points for pedestrians and bicyclists
- Medium impact on improving travel time reliability

Estimated Costs:

- Costs vary significantly depending on value of access rights and property values.

Influencing Factors:

Political Factors	• Access rights acquisition • Land use regulation • Different stakeholder interests should be considered
Institutional Factors	• Cooperation among and involvement of relevant government agencies, business owners, land developers and the public is necessary.
Technical Factors	• Access management can be adopted easily in the pre-development stage, but extremely difficult in the post-development stage.

3.1.2 – Advanced Signal Systems (A2)

Description: Advanced signal systems include coordinated signal operations across neighboring jurisdictions, as well as centralized control of traffic signals which may include the necessary infrastructure for development of innovative control strategies such as transit signal priority, truck priority or adaptive signal control.

Example Strategy Applications:

- Adaptive or Active Signal Control
- Traffic Responsive Control
- Transit Signal Priority
- Truck Signal Priority
- Real-time Signal Performance Measures
- Improved Signal Communication (Signal interconnect or link to central location)

Potential Benefits:

- Reduced delay, travel time and stops
- Increased average vehicle speed
- Reduced vehicle emissions
- High impact on improving travel time reliability

Estimated Costs:

- $20 - $25 per foot for copper wire signal interconnect; $5000 per intersection for wireless interconnect (availability depends on agencies and signal locations);
- $50,000 to $150,000 per intersection to install adaptive signal control (license, detection infrastructure and training).
- $1 - 2 million for adaptive signal system integration and firmware upgrade

Influencing Factors:

Political Factors	• New system needs to have significant advantage over the existing one to make the expenses reasonable
Institutional Factors	• Signal control across jurisdictions has to be coordinated, clear understanding of technology is necessary; • System compatibility across jurisdictions may not be an issue in Oregon as they use the same signal system platform
Technical Factors	• Keep up with changing signal technology • Consider risk/reward for "untested" technology • Benefit to implementing system features that are interoperable across manufacturer • Budget for training of new technology, and continued maintenance and support over life of technology.

3.1.3 – Changeable (or Dynamic) Lane Assignment (A3)

Description: The use of Changeable Lane Assignments Signs (CLAS) on frontage or streets adjacent to freeways can mitigate the lane imbalances seen on a time-of-day recurring basis and during freeway incidents. As traffic signals have long been used as a time management technique for optimizing traffic operations, CLAS is used as a space management technique to add an additional dimension to optimization.

Example Strategy Applications:

- Changeable lane assignment displays
  - Event or evacuation or incident management
  - Optimize existing pavement in response to recurring changing travel patterns

Potential Benefits:

- Reduced delay by 1% to 26% and increased throughput by 50 to 1,000 vehicles per hour during incidents or other conditions
- Medium impact on improving travel time reliability

Estimated Costs:

- Relatively low cost, but no specific numbers available.

Influencing Factors:

Institutional Factors	• Requires interagency cooperation when part of a larger management strategy, such as incident management or integrated corridor management.
Technical Factors	• Driver awareness and adjustment to their use. Require adequate approach and receiving lanes to facilitate their use.

3.1.4 – Signal Retiming/Optimization (A4)

Description: Signal retiming / optimization includes updating signal timing plans for prevailing traffic conditions, interconnecting signals, and potentially upgrading signal technology to meet timing objectives.

Example Strategy Applications:

- Developing and implementing revised or new signal timing plans
- Installing or upgrading signal communication infrastructure (locally with interconnect, regionally with fiber or wireless connection to a central location)
- Installing or upgrading signal technology (i.e. cabinet, controller, detection)

Potential Benefits:

- Reduced travel time by 10% to 25%
- Decreased fuel consumption
- High benefit-to-cost ratio which can range from 17:1 to 40:1
- High impact on improving travel time reliability

Estimated Costs:

- $3,000 - $5,000 per intersection for signal retiming
- $1,000 - $4,000 for controller + software replacement/upgrades (if necessary)

Influencing Factors:

Political Factors	• Prioritizing operational efficiency benefit over other projects
Institutional Factors	• Key to have coordination and compatibility across agencies for new timing plans or signal system infrastructure.
Technical Factors	• Understanding new technology, capabilities and limitations • Realize signal retiming and optimization should be revisited as needed, but every 3-5 years is recommended

3.1.5 – Red Light Running Cameras / Automated Enforcement (A5)

Description: Automated enforcement technologies can assist with the enforcement of traffic signal compliance. Still or video cameras, activated by detectors, can record vehicles traveling through a red signal.

Example Strategy Applications:

- Red Light Cameras (either video or still frame)
  - Agency owned (high initial capital cost and regular maintenance, but keep all or portion of profits).
  - Agency leased (lower capital cost, vendor maintains system, but keeps all or a portion of profits).

Potential Benefits:

- Decreased severity and number of turning/angle crashes (increased number of rear-end crashes)
- 60-80% of drivers approve of their use based on survey data
  20-75% reduction in red light violations

Estimated Costs:

- $65,000 to $80,000 per intersection

Influencing Factors:

Political Factors	• Public perception of automated enforcement
Institutional Factors	• Agencies should ensure clear laws or codes are in place to support automated enforcement (i.e. will citation go to registered vehicle owner or driver of vehicle at the time). • Coordination with legal departments/lawyers maybe necessary upon start up due to law suits • Who operates and maintains the system? Where do profits go?
Technical Factors	• Places greater scrutiny on signal timing and clearance interval timings.

3.1.6 – On-Street Parking Management (A6)

Description: The management of on-street parking locations, durations, and vehicle types to allow more efficient use of existing roadway capacity and reduce potential conflicts which reduce traffic flow rates.

Example Strategy Applications:

- Temporary or full-time on-street parking restrictions
- Restrictions on delivery vehicle parking or double-parking (more typical in downtowns)
- Increased enforcement of parking restrictions

Potential Benefits:

- Increased saturation/traffic flow
- Efficient use of roadway capacity without adding new pavement

Estimated Costs:

- Minimal signing and striping costs.
- Increased enforcement can be costly if new staff is required.

Influencing Factors:

Political Factors	• Prioritizing the importance of moving vehicles over business access
Institutional Factors	• Easier to plan to manage parking on a new facility, than to remove or restrict on-street parking on an existing facility • Coordinate management strategy across jurisdictional boundaries when necessary
Technical Factors	• Interaction with bicycle lanes

3.1.7 – Active Traffic Management (AF7)

Description: Active traffic management consists of a combination of operational strategies that, when implemented in concert, fully optimize the existing infrastructure and provide measurable benefits to the transportation network and the motoring public. These strategies include but are not limited to speed harmonization, temporary shoulder use, junction control, dynamic signing and rerouting and managed lanes.

Example Strategy Applications:

- Variable speed limits (speed harmonization)
- Managed lanes (dynamic lane assignment, reversible lanes, temporary shoulder use)
- Changeable lane assignment
- Real-time traveler information (i.e. dynamic message signs, mobile traffic data)
- Advanced signal systems (i.e. optimized or adaptive signal timing)

Potential Benefits:

- Increase in average throughput in congested periods by 3% to 7%
- Decrease in accident rate by 3 to 50%

Estimated Costs:

- Varies depending on application, but system development is typically high because it involves multiple TSMO strategies in concert.

Influencing Factors:

Political Factors	• Prioritizing operational efficiency benefit with existing system over expanded system capacity projects
Institutional Factors	• Key to have coordination and compatibility across agencies to maximize effectiveness
Technical Factors	• Understanding new technology, capabilities and limitations • Budget for training if new technology, and continued maintenance and support over life of technology. • Consider risk/reward for "untested" technology

3.1.8 – Event Management (AF8)

Description: Event transportation management systems can help control the impact of congestion at stadiums or convention centers. In areas with frequent events, large changeable destination signs or other lane control equipment can be installed. In areas with occasional or one-time events, portable equipment can help smooth traffic flow.

Example Strategy Applications:

- Reversible lanes, temporary shoulder use
- Changeable lane assignment
- Advanced signal systems (i.e. optimized or adaptive signal timing)
- Additional temporary signage and traffic control

Potential Benefits:

- Reduced delay amidst heavy demand during special events
- Reduced crash rates due to reduced conflicts
- Increased attractiveness of event attendance, particularly repeat attendees
- Medium impact on improving travel time reliability

Estimated Costs:

- $2,000 - $3,000 per intersection for specialized event timing plan;
- $20-$50 per hour per officer for manual traffic control
- $2,000 - $3,000 per reversible lane control display; $300K - $450K per lane control system including software, integration and other hardware costs

Influencing Factors:

Political Factors	• Frequent roadway detours and lane control measures may bring confusion and inconvenience to drivers and nearby residents
Institutional Factors	• Coordination with various event organizers and agencies is necessary
Technical Factors	• Events of various magnitude in different locations require different measures and scope of coordination

3.1.9 – Integrated Corridor Management (AF9)

Description: Integrated corridor management recognizes that a transportation system operation is most effective when viewed from the overall system perspective. With integrated corridor management, the various institutional partner agencies manage the transportation corridor as a system, rather than the more traditional approach of managing individual assets. Travelers could receive information that encompasses the entire transportation network. They could dynamically shift to alternative transportation options, even during a trip, in response to changing traffic conditions.

Example Strategy Applications:

- Real-time traveler information (i.e. dynamic message signs, mobile traffic data)
- Advanced signal systems (i.e. optimized or adaptive signal timing)
- Changeable lane assignment

Potential Benefits:

- Reduced travel time and delays
- Increased reliability and predictability of travel

Estimated Costs:

- $50,000 - $100,000 per variable message signs depending on size; $1 - 3 million to design and implement;
- $100,000 - 2 million for annual O&M which varies among the scope of the system
- $2,000 - $3,000 per intersection for specialized signal timing plan

Influencing Factors:

Political Factors	• Prioritizing management of the system over capacity expansion projects
Institutional Factors	• Interagency cooperation and implementation is key to project success
Technical Factors	• Understanding new technology, capabilities and limitations • Budget for training if new technology, and continued maintenance and support over life of technology.

3.1.10 – Real-Time Traveler Information (AF10)

Description: Traveler Information activities include the collection and dissemination of information to the traveling public. This information includes traffic and road conditions, general public transportataion and parking information, incident information, roadway maintenance and construction information, and weather information. Motorists are now able to receive relevant information on location-specific traffic conditions in a number of ways, including dynamic message signs (DMS), highway advisory radio (HAR), and in-vehicle signing, or specialized information transmitted to individual vehicles.

Example Strategy Applications:

- Dynamic message signs
- Highway advisory Radio
- GPS-based in-vehicle traffic data
- Traffic surveillance cameras

Potential Benefits:

- Reduced delay by 1% to 22% and number of stops by 5% to 6%
- Reduced gas emissions by 3% to 5%
- Decreased crash fatalities by 3%
- High potential to improve travel time reliability

Estimated Costs:

- $50,000 - $100,000 per variable message signs depending on size
- $1 - 3 million to design and implement
- $100,000 - 2 million for annual O&M which varies among the scope of the information system
- $300 per GPS unit; $150 per year for operation (DASH)

Influencing Factors:

Political Factors	• Prioritizing information systems over expanded capacity projects. • High project visibility potential among the public
Institutional Factors	• Agency partnership and data/resource sharing to create a robust system
Technical Factors	• Rapidly changing field, user understanding is key

3.1.11 – Real-Time Traffic Data Collection Using Private GPS Data (AF11)

Description: Automobiles are used to monitor the surrounding environment with an onboard computer. Data are sent to a Web server through pre-existing Wi-Fi networks, which help drivers track conditions specific to their cars and provides historical and real-time traffic conditions at different times of the day using combined data from all service subscriber participants.

Example Strategy Applications:

- DASH navigation system
- Indiana DOT/Purdue University pilot project using cell phone data to track vehicles

Potential Benefits:

- Reduce travel time and delay by alerting and informing drivers of congested areas
- Reduce potential crashes due to congestion
- High potential to improve travel time reliability

Estimated Costs:

- $300 per GPS unit; $150 per year for operation (DASH/MIT product)
- Access to the data has not been discussed with potential vendors

Influencing Factors:

Institutional Factors	• Is the GPS vehicle data shared with the agency and at what cost?
Technical Factors	• Understanding new technology, capabilities and limitations • Integration with other ITS components

3.1.12 – Vehicle Infrastructure Initiative (AF12)

Description: Vehicle Infrastructure Initiative (VII) is a research program focused on enabling wireless communications among motor vehicles and between motor vehicles and roadside infrastructures. This involves various public and private sector entities. By enabling secure real-time communications with motor vehicles, new services will be enabled to enhance transportation safety, mobility, and commerce. It is likely that VII strategies are several years from implementation, unless a significant effort by the region is made to attract a demonstration program from FHWA or through OTREC.

Example Strategy Applications:

- In-vehicle communication and interaction with roadway/signal infrastructure

Potential Benefits:

- Decrease traffic accidents and fatalities
- Reduced delays
- Increased effective roadway capacity

Estimated Costs:

- Costs remain estimates because this initiative is in its infancy.

Influencing Factors:

Institutional Factors	• Coordination between agencies is critical to provide uniform driver information
Technical Factors	• VII is under development and considerable amount of time is needed before large scale deployment is possible and communication infrastructure is mature

3.1.13 – Automated Speed Enforcement (AF13)

Description: Automated speed detection (typically in work zones) can enable automated ticketing of vehicles exceeding posted speed limits when combined with automatically triggered vehicle identification technologies such as photographs, still or video digital imaging, or license plate recognition. Some systems transmit images of offending vehicles to police officers downstream of the work zone where enforcement can be carried out more safely.

Example Strategy Applications:

- Automated Speed Enforcement Cameras (either video or still frame)
    - Agency owned (high initial capital cost and regular maintenance, but keep all or portion of profits).
    - Agency leased (lower capital cost, vendor maintains system, but keeps all or a portion of profits).

Potential Benefits:

- Increased perception of safety
- Reduced travel speeds

Estimated Costs:

- $85,000 per vehicle mounted camera
- $20,000 per fixed location installation (speed trailers)

Influencing Factors:

Political Factors	• Public perception of automated enforcement
Institutional Factors	• Who does the operations and maintenance? How are costs and profits distributed?

3.1.14 – Traffic Surveillance (AF14)

Description: Many of the services possible through arterial and freeway management systems are enabled by traffic surveillance and detection technologies, such as sensors or cameras, monitoring traffic flow. Traffic surveillance is a key building block to many of the strategies identified in the toolbox

Example Strategy Applications:

- Vehicle detection/counters (i.e. inductive loops, microwave, video)
- Closed circuit video (CCTV)

Potential Benefits:

- Improved incident response times and accuracy of information disseminated to emergency responders
- Real-time and historic system operations information
- Improved visual information for decision-makers and the public

Estimated Costs:

- $15,000 - $30,000 per CCTV detection unit, $400 to $2,000 per loop detector, additional costs for cabinet and related hardware
- Wireless communications to cameras has reduced costs significantly
- Costs for for central system integration and continued improvements to incorporate new cameras

Influencing Factors:

Political Factors	• Public perception of "big brother" surveillance and invasion of privacy
Institutional Factors	• Sharing communication infrastructure and broadcasts across agencies
Technical Factors	• Integrating with other TSMO or ITS components

3.1.15 – Emergency Management (AF15)

Description: ITS applications in emergency management include hazardous materials management, the deployment of emergency medical services, and large and small-scale emergency response and evacuation operations.

Example Strategy Applications:

- On road incident responders
- Emergency vehicle traffic signal preemption or priority
- Evacuation strategies (i.e. reversible or shoulder lanes, specialized signal timing plans)

Potential Benefits:

- Reduced incident response time
- Improved HAZMAT and counterterrorism technology
- Improved travel time and less congestion under evacuation scenarios

Estimated Costs:

- Cost varies depending on the scale and scope of the emergency management system;
- Cost of an emergency operation center may range from $150K to $5 million;
- Hazmat transportation operation technology may range from $250 to $3,500 per vehicle.
- GPS AVL on emergency vehicles costs $4,000 per intersection and $2,000 per vehicle.

Influencing Factors:

Political Factors	• Viewed as proactive protection of public safety
Institutional Factors	• Coordination between agencies is critical to success
Technical Factors	• Integration of multiple ITS components may aid in project effectiveness

3.1.16 – Incident Management (F16)

Description: Incident management systems can reduce the effects of incident-related congestion by decreasing the time to detect incidents, the time for responding vehicles to arrive, and the time required for traffic to return to normal conditions. Incident management systems make use of a variety of surveillance technologies as well as enhanced communications and other technologies that facilitate coordinated response to incidents.

Example Strategy Applications:

- Traffic surveillance (i.e. CCTV, vehicle detection)
- On road incident responders
- Real-time traveler information systems (i.e. highway advisory radio, dynamic message signs)
- Regional coordination with other traffic management and emergency management centers

Potential Benefits:

- Reduced average incident duration by 28% to 70%
- Decreased secondary crashes by up to 28% to 70%
- Reduced delay due to quicker incident response
- Medium potential to improve travel time reliability

Estimated Costs:

- $15,000 - $30,000 per CCTV detection unit, $400 per loop detector
- $55 per vehicle hour for patrolling vehicle
- $8,000 - $13,000 per unit of mobile incident investigation equipment

Influencing Factors:

Political Factors	• Prioritizing incident response/system management over system expansion
Institutional Factors	• Various agencies and first responders need to be coordinated, inter-agency communication is the key • Systems may provide flexibility for future installation and coordination by neighboring jurisdictions
Technical Factors	• A sound communication system with wide coverage is crucial; interoperability issue among different agencies

3.1.17 – Work Zone Management (F17)

Description: ITS applications in work zones include the temporary implementation of traffic management or incident management capabilities. These temporary systems can be stand-alone implementations or they may supplement existing systems in the area during construction. Other applications for managing work zones include measures to control vehicle speeds and notify travelers of changes in lane configurations or travel times and delays through the work zones. ITS may also be used to manage traffic along detour routes during full road closures to facilitate rapid and safe reconstruction projects.

Example Strategy Applications:

- Variable speed limits / automated speed enforcement
- Real-time traveler information

Potential Benefits:

- Reduced traveling speed across work zone by 9 mph
- Improved safety with reduced travel speed
- Reduced delay by 46% to 55% and travel time
- High potential to improve travel time reliability

Estimated Costs:

- $150 - 800k for a work zone management system, which commonly includes variable message signs ($50k-120k capital, $2.5k-6k operations and maintenance),
- CCTV-surveillance ($7k-19k capital, $1.0k-2.5k operations and maintenance), Highway Advisory Radio ($16-32k capital, $500-1,000 operations and maintenance), traffic detectors ($3-13k capital, $100-1,000 operations and maintenance) and variable speed limit display ($3-5k capital), etc.
- Costs are dependant on agency leasing or purchasing, and portable versus permanent components.

Influencing Factors:

Political Factors	• Prioritizing safety over system capacity expansion projects
Technical Factors	• Coordination with other ITS components is key

3.1.18 – HOV/HOT Managed Lanes (F18)

Description: HOV lanes carry vehicles with a higher number of occupants, which serve to increase the total number of people moved through a congested corridor. In general, carpoolers, vanpoolers, and bus patrons are the primary beneficiaries of HOV lanes by allowing them to move through congestion. HOT lanes allow single occupancy vehicles to use the HOV lanes for a toll.

Example Strategy Applications:

- HOV lanes
- HOT lanes

Potential Benefits:

- Improved people throughput by allowing a higher flow for HOV
- Incentive for carpooling/vanpooling/transit
- Can remove vehicles from roadway, reducing emissions
- Medium/High potential to improve travel time reliability

Estimated Costs:

- $100,000 to $3 million per mile capital costs, depending on need to reconstruct lanes or not.
- Low operations and maintenance costs, generally on HOV lanes. Tolled HOT lanes are more costly to build, operate and maintain due to tolling infrastructure and staff.

Influencing Factors:

Political Factors	• High public perception, involves public policy decision for prioritizing people movement over individual vehicle movement.
Institutional Factors	• If congestion spans agencies, they should work together to implement consistent TSMO strategies to realize full benefits.
Technical Factors	• May increase congestion for general purpose lane

3.1.19 – Reversible Lanes (F19)

Description: Traffic sensors and lane control signs can be used to implement reversible flow lanes allowing travel in the peak direction during rush hours or for special events/emergencies.

Example Strategy Applications:

- Temporary or permanent signage for reversible lanes

Potential Benefits:

- Reduced crash rates due to decreased congestion
- Improve travel time and delay in peak directions
- More efficient use of existing roadway pavement/capacity

Estimated Costs:

- $2,000 - $3,000 per lane control display;
- $300K - $450K per lane control system including software, integration and other hardware costs

Influencing Factors:

Political Factors	• May create confusion for infrequent drivers
Institutional Factors	• Education for the public on what they are expected to do during contra-flow situations is necessary
Technical Factors	• New technology in US

3.1.20 – Lane Controls/Temporary Shoulder Use (F20)

Description: Lane control signs, supported by surveillance and detection technologies, allow the temporary closure of lanes to avoid incidents on freeways, or use of shoulders as a travel lane to increase capacity.

Example Strategy Applications:

- Temporary shoulder use
- Temporary lane closure for work zone or incident
- Reversible lanes

Potential Benefits:

- Reduced crash rates
- Improve travel time and delay in peak directions
- More efficient use of existing roadway pavement/capacity

Estimated Costs:

- $2,000 - $3,000 per lane control display;
- $300K - $450K per lane control system including software, integration and other hardware costs

Influencing Factors:

Political Factors	• May create confusion for infrequent drivers
Institutional Factors	• Education for the public on what they are expected to do during contra-flow situations is necessary
Technical Factors	• New technology in US

3.1.21 – New Toll Roads/Congestion Pricing (F21)

Description: Congestion pricing is a way of harnessing the power of the market to reduce the waste associated with traffic congestion. Congestion pricing works by shifting purely discretionary rush hour highway travel to other transportation modes or to off-peak periods, taking advantage of the fact that the majority of rush hour drivers on a typical urban highway are not commuters.

Example Strategy Applications:

- Constructing or converting a roadway or a portion of roadway to tolling
- Cordon pricing for entry to a certain district (i.e. London, England)

Potential Benefits:

- Provided high level of service to users, with 20% decrease in traffic for the London case
- Divert traffic to another mode or to travel at different times of the day
- Medium potential to improve travel time reliability

Estimated Costs:

- $250,000 per mile for conversion of HOV to HOT lanes
- $2 - 4 million per lane per mile for new construction of HOT lanes

Influencing Factors:

Political Factors	• Can be publicly controversial, tough to establish toll facilities if the concept is new to a region or not widely practiced
Technical Factors	• Effects of different tolling methods vary, benefits versus costs need to be carefully considered

3.1.22 – Electronic Toll Collection (F22)

Description: Electronic toll collection (ETC) supports the collection of payment at toll plazas using automated systems to increase the operational efficiency and convenience of toll collection. Systems typically consist of vehicle-mounted transponders identified by readers located in dedicated and/or mixed-use lanes at toll plazas

Example Strategy Applications:

- Electronic toll collection with vehicle mounted transponders

Potential Benefits:

- Reduced traffic volume by up to 17%
- Reduced delay by 50% to 85%
- Reduced vehicle emissions by 16% to 63%
- Cost saving for electronic toll lane over staffed lane (ETC only requires one maintenance person and account support)
- High potential for improved travel time reliability

Estimated Costs:

- ~$1 million hardware cost for a 7-lane toll plaza; $16,000 per year to operate an electronic toll collection lane;
- $0.05-0.10 cost per ETC transaction; $15-$50 cost for each transponder

Influencing Factors:

Political Factors	• Privacy concern on vehicle and personal information with the use of tolling technologies
Institutional Factors	• Interoperability issues at the transponder level with neighboring toll facilities
Technical Factors	• Plan for changes in tolling technologies so that interoperability can be attained easily in the future

3.1.23 – Road Weather Information Systems (F23)

Description: Road weather management includes the surveillance, monitoring, and prediction of weather and roadway conditions. It enables the appropriate management actions to mitigate the impacts of any adverse conditions especially during winter and snowy conditions.

Example Strategy Applications:

- Closed circuit cameras
- Ramp closures
- Real-time traveler information (i.e. dynamic message signs, highway advisory radio)
- Variable speed limits

Potential Benefits:

- Improved safety by reducing 3 to 17% of crashes
- Reduced vehicle speed by 2 to 5 mph during adverse weather
- Improved information for agency decision-makers and travelers
- High potential to improve travel time reliability

Estimated Costs:

- Cost varies which can range from $20,000 for a sensor unit to over $3 million for a weather management system.
- Weather station ($20-50k capital, $1.5-4k operations and maintenance)
- CCTV-surveillance ($7k-19k capital, $1k-2.5k operations and maintenance)
- Highway Advisory Radio ($16-32k capital, $500-1,000 operations and maintenance)
- Variable message signs ($50k-120k capital, $2.5k-6k operations and maintenance)
- Variable speed limit display ($3-5k capital).

Influencing Factors:

Political Factors	• Prioritizing safety over expanded system capacity
Institutional Factors	• Interagency cooperation provides greatest benefit to traveling public
Technical Factors	• Integration of various ITS components

3.1.24 – Bottleneck Removal (F24)

Description: Bottleneck removal in freeway can be achieved by various geometric or operational strategies after identifying the bottleneck locations and detecting the causes.

Example Strategy Applications:

- New general purpose or auxiliary lanes
- Temporary shoulder use
- Interchange geometry reconfiguration

Potential Benefits:

- Decreased injury crash rate by 35% on average
- Reduced delay
- High potential to improve travel time reliability

Estimated Costs:

- Cost varies, can range from a few thousand dollars to tens of millions

Influencing Factors:

Technical Factors	• Sufficient and accurate data collection is important for bottleneck analysis and the subsequent mitigation

3.1.25 – Ramp Closures (F25)

Description: Surveillance and control technologies can allow for the temporary closure of freeway ramps to accommodate peak traffic conditions or inclement weather conditions.

Example Strategy Applications:

- Closing a ramp due to weather, and recurring/non-recurring congestion

Potential Benefits:

- Reduced crash rates
- Increased mobility on mainline
- Medium potential to improve travel time reliability

Estimated Costs:

- Generally low for infrastructure

Influencing Factors:

Political Factors	• Limits access to roadways, can be met with significant resistance.
Institutional Factors	• Congestion may worsen on remaining interchanges as additional demand burdens the surface street system
Technical Factors	• Should be integrated with other ITS components (traffic management center, weather management system, etc)

3.1.26 – Ramp Metering (F26)

Description: Traffic signals on freeway ramp meters alternate between red and green signals to control the flow of vehicles entering the freeway. Metering rates can be altered based on freeway traffic conditions. ODOT has a successful implementation of ramp metering throughout the Portland-metropolitan area. Expansion farther from the City is a potential.

Example Strategy Applications:

- Signalized ramp metering

Potential Benefits:

- Reduced mainline peak period delay
- Increased freeway speed by 8% to 26%
- Improved freeway capacity by 10%
- Reduced duration of congestion
- Reduced vehicle conflicts by 24% to 50%
- High potential to improve travel time reliability

Estimated Costs:

- $25,000 - $66,000 per site
- $6,500 for detection components per site
- $1,000-$3,000 per site for annual operation and maintenance

Influencing Factors:

Political Factors	• Public perception and potential resistance
Institutional Factors	• Agency coordination on operations to ensure impact of ramp queues is tolerable.
Technical Factors	• Maintenance of infrastructure and timing plans to address changing traffic patterns and needs of the various communities.

3.1.27 – HOV Ramp Bypass (F27)

Description: Priority access to highway is given to HOVs. Access options include allowing HOVs to bypass ramp meters, providing a dedicated flyover ramp for HOVs, etc. ODOT operates a few of these facilities throughout the Metro area.

Example Strategy Applications:

- HOVs have their own exclusive lane or ramp for quicker or unimpeded freeway access

Potential Benefits:

- Reduced passenger travel time by 2% to 15%
- Incentive for carpooling/vanpooling/transit
- Can remove vehicles from roadway, reducing emissions by 2% to 13%
- Medium potential to improve travel time reliability

Estimated Costs:

- $100,000 to $3 million per mile capital costs, depending on need to reconstruct lanes or not.
- Low operations and maintenance costs, generally.

Influencing Factors:

Political Factors	• High public perception, involves public policy decision for prioritizing people movement over individual vehicle movement.
Institutional Factors	• Agencies should work together to develop a ramp metering system and timing plan to avoid queue spillback to upstream intersections.

3.1.28 – Transportation Management Center (F28)

Description: The purpose of a Transportation Management Center is to integrate various departments and offices of transportation and emergency agencies into a unified communications center. The integration provides the communications and computer infrastructure necessary for coordinated transportation management on roadways during normal commuting periods, as well as during special events and major incidents. ODOT operates the Region 1 TMC successfully to manage incidents and provide traveler information.

Example Strategy Applications:

- Central management location to monitor, change, and measure the transportation system

Potential Benefits:

- More efficient coordination and operation of various transportation systems
- Better data collection for decision-making and future planning purposes
- Co-locate and collaborate with traffic, transit, fire, emergency, police, etc.

Estimated Costs:

- $1.8 million - 10 million for TMC capital cost
- $400K - $2 million for annual O&M

Influencing Factors:

Political Factors	• Expenses may be shared depending on the scope of the TMC
Institutional Factors	• Communication and interoperability issues may exist among agencies. Changing agency culture to operate differently. • Further collaboration with transportation, emergency, police, fire, etc.
Technical Factors	• TMCs are a unique management challenge for local agencies. • Center-to-Center communication requires significant investment and coordination (CTIC involvement)

3.1.29 – Variable Speed Limits (F29)

Description: Variable speed limit systems use sensors to monitor prevailing traffic and/or weather conditions, posting appropriate enforceable speed limits on dynamic message signs. Also known as "speed harmonization."

Example Strategy Applications:

- Variable speed limit systems

Potential Benefits:

- Decreased mean travel speeds by up to 3 mph
- Reduced crash rates
- Reduction of congestion
- High potential to improve travel time reliability

Estimated Costs:

- $3,000 - $5,000 per variable speed display sign
- Implementation costs associated with upgrades of infrastructure, monitoring systems

Influencing Factors:

Political Factors	• Potential need to increase law enforcement of variable speeds • Application would require review by Oregon legislature
Institutional Factors	• Cooperative or identical systems should be used across jurisdictional boundaries
Technical Factors	• Integration into detection/surveillance and communication systems

3.2 Freight Strategies

This section describes the menu of strategies for TSMO involving freight and intermodal modes.

3.2.1 – Real-Time Freight Information (FR30)

Description: Real-time information on cargo status can be provided to ocean carriers, exporters, importers, foreign freight forwarders, customs brokers, terminal operators, and rail and trucking services. It enables port users to post and receive information on the location and status of freight shipments.

Example Strategy Applications:

- Vehicle tracking (AVL) systems
- In-vehicle traffic and roadway data
- Real-time traveler information (i.e. highway advisory radio, dynamic message signs)

Potential Benefits:

- Ability to track the freight location and estimate the traffic condition for real-time freight route planning
- Increased freight movement efficiency

Estimated Costs:

- Ranges from $500 to $2,500 per in-vehicle tracking equipment depending on the functionality

Influencing Factors:

Political Factors	• Prioritizing freight movement over people
Technical Factors	• Integration with other ITS components (i.e signal system for truck priority)

3.2.2 – Roadside Electronic Screening/Clearance Programs (FR31)

Description: Electronic screening applications promote safety and efficiency for commercial vehicle operators. Carriers that equip their fleets with low-cost in-vehicle transponders can communicate with check stations and automatically transfer regulatory data to authorities as trucks approach check stations. These and other technologies such as weight-in-motion (WIM) scales improve efficiency and reduce congestion at check stations by allowing safe and legal carriers to bypass inspections and return to the mainline without stopping.

Example Strategy Applications:

- Weight-in-motion scales
- GPS and AVL systems
- Clean power source at truck stops

Potential Benefits:

- Reduced inspection time by 14% to 66%
- Reduced freight travel time and delay
- Reduced vehicle emissions

Estimated Costs:

- $150k to $780k per electronic screening weigh station

Influencing Factors:

Political Factors	• Prioritizing freight movement over people
Technical Factors	• Integration with other ITS components (i.e freight AVL)

3.2.3 – Truck Only Lanes (FR32)

Description: Truck-only lanes are lanes designated for the use of trucks. The purpose of truck-only lanes is to separate trucks from other mixed-flow traffic to enhance safety and/or stabilize traffic flow.

Example Strategy Applications:

- Construct or convert truck-only lanes (full-time or part-time)

Potential Benefits:

- Increased highway safety
- More stable traffic flow
- Medium potential to improve travel time reliability

Estimated Costs:

- $100,000 to $3 million per mile capital costs, depending on need to reconstruct lanes or not.
- Low operations and maintenance costs, generally.

Influencing Factors:

Political Factors	• Prioritizing freight movement over people
Technical Factors	• Truck only lanes are not common in the US

3.2.4 – Truck Signal Priority (FR33)

Description: Truck signal priority is used to improve the operation of heavy trucks passing through traffic signal controlled intersections on rural high-speed highways, by adding vehicle detectors that respond only to trucks. The City of Portland has implemented this at a few locations within the City.

Example Strategy Applications:

- Truck Signal Priority (Green extension only is typical)

Potential Benefits:

- Reduced number of truck stops, which is estimated to cost $3 per truck per stop

Estimated Costs:

- $30,000 per inductive loop truck detector; $5,000 per intersection for data collection and retiming effort

Influencing Factors:

Political Factors	• Prioritizing freight movement over people
Technical Factors	• Adjusts the traffic actuated signal systems which can decrease the presence of vehicles in the dilemma zone, potentially resulting in a safety issue • Green extension is the most beneficial priority type

3.2.5 – Freight Vehicle Tracking (AVL) (FR34)

Description: Automated vehicle location, together with computer aided dispatch systems, can assist carriers with scheduling and tracking of vehicle loads.

Example Strategy Applications:

- GPS, AVL system in vehicle
- Central dispatch or vehicle-vehicle communication

Potential Benefits:

- Increased fleet productivity by 5% to 25%
- Improved HAZMAT safety and security by reducing potential terrorist consequences by approximately 36%

Estimated Costs:

- Ranges from $500 to $2,500 per in-vehicle tracking equipment depending on the functionality

Influencing Factors:

Technical Factors	• Integration with other ITS components (i.e signal system for truck priority)

3.3 Transit Strategies

This section describes the menu of strategies for TSMO involving transit modes.

3.3.1 – Park and Ride Lots (T35)

Description: Park and ride facilities are public transport stations that allow commuters and other people wishing to travel into city centers to leave their personal vehicles in a car park and transfer to a bus, rail system or carpool for the rest of their trip.

Example Strategy Applications:

- Park and ride surface lot or garage.
- Off-street parking management (i.e. info system to relay number and location of available spaces)

Potential Benefits:

- Ease congestion and parking demand in city center
- Increase transit ridership

Estimated Costs:

- $5,000 per stall (surface lot)
- $15-25,000 per stall (above ground garage)
- $35-40,000 per stall (below ground garage)

Influencing Factors:

Political Factors	• Policy decisions for high downtown parking charges can lead to park and ride demand.
Institutional Factors	• Partnership with roadway and transit agencies is key. • Land availability along transit routes may require structure parking
Technical Factors	• Integrate into other ITS components (i.e. off-street parking management)

3.3.2 – Real-Time Transit Information (T36)

Description: Transit agencies can disseminate both schedule and system performance information to travelers through a variety of applications, in-vehicle, wayside, or in-terminal dynamic messages signs, as well as the internet or wireless devices. Coordination with regional or multimodal traveler information efforts can also increase the availability of this transit schedule and system performance information. TriMet has implemented this through its Transit Tracker system.

Example Strategy Applications:

- Dynamic message signs at transit stops
- On-line website integrated with real-time transit ITS (i.e. AVL/GPS)

Potential Benefits:

- Enhanced passenger convenience
- Increased attractiveness of transit

Estimated Costs:

- Information will be requested from TriMet if needed.

Influencing Factors:

Political Factors	• N/A
Institutional Factors	• Cooperation and integration between for dissemination of the information agencies (inclusion of Trimet information on Tripchek.org) may encourage travelers to consider transit as opposed to driving alone.
Technical Factors	• GPS location refreshing rate is critical for real-time transit information but limited by communication bandwidth; • Signs at transit stop are less worthwhile if everyone can use their cell phone or web enabled phone to check the transit arrival time

3.3.3 – Transit Signal Priority (T37)

Description: Transit signal priority (TSP) systems use sensors to detect approaching transit vehicles and alter signal timings to improve transit performance. TriMet has integrated Opticom emitters into the bus Automatic Vehicle Location system to request priority when an equipped meets the following criteria: bus is behind schedule, within the City of Portland, and the doors of the bus are closed. The City of Portland has the only application of bus priority in the region, applied on most of the major arterial corridors throughout the City. Light rail transit vehicles receive preemption and priority at intersections throughout its length in Portland, Beaverton, Hillsboro, and Gresham.

Example Strategy Applications:

- Green extension
- Red truncation (early green, may include phase skipping)
- Exclusive transit phase(s)
- Transit only lanes/queue jumps

Potential Benefits:

- Improved Overall Travel Time by 2% to 42%/Reduced Delay up to 48%
- Improved Travel Time Reliability/Less Variability
- Fleet reduction
- Reduced system operational costs (number of buses and fuel costs)

Estimated Costs:

- $5k to $35k per intersection
- $2k to $14k per bus

Influencing Factors:

Political Factors	• Willingness to prioritize transit over other modes at critical intersections
Institutional Factors	• Signal system capabilities across agencies
Technical Factors	• Infrastructure to support TSP (i.e. controllers) • Transit signal priority in place always, or by time of day, number of riders, and schedule adherence.

3.3.4 – Transit Only Lanes/Queue Jumps (T38)

Description: Transit-only lanes are lanes designated for the use of transit vehicles only. The purpose of transit-only lanes and transit queue jumps are to provide preferential treatments to give transit an advantage over other roadway modes.

Example Strategy Applications:

- Transit only lanes/queue jumps
- Transit signal priority
- Exclusive transit phase(s)

Potential Benefits:

- Reduced transit delay
- Improved transit travel times
- Increased transit ridership

Estimated Costs:

- $75,000 to $125,000 per approach for queue jump/bus bypass (not including right-of-way costs)
- $100,000 to $3 million per mile capital costs, depending on need to reconstruct lanes or not.
- Low operations and maintenance costs, generally.

Influencing Factors:

Political Factors	• Willingness to prioritize transit over other modes
Institutional Factors	• Signal system capabilities across agencies
Technical Factors	• Infrastructure to support transit preferential treatments (controllers, interconnect, etc) • Transit preferential treatments in place always, or by time of day, number of riders, and schedule adherence.

3.3.5 – Transit Vehicle Tracking (AVL) (T39)

Description: Automatic vehicle location (AVL), together with computer aided dispatch (CAD) systems, facilitates the management of transit operations, providing up-to-date information on vehicle locations to assist transit dispatchers as well as inform travelers of bus status.

Example Strategy Applications:

- GPS/AVL system
- Real-time traveler/passenger information systems

Potential Benefits:

- Enhanced passenger convenience
- Better on-time performance, early and late arrivals were decreased by 12 and 21% respectively in a Denver study, performance increased from 80% to 90% in Kansas City
- Lower operation and maintenance cost due to smaller fleet size needed, without degradation in customer service

Estimated Costs:

- $3,000 - $6,000 per GPS equipment installation
- $60,000 - $70 million depending on the size of fleets

Influencing Factors:

Political Factors	• Objection from union on adopting ITS due to the increased probability of layoff
Institutional Factors	• Multiple AVL systems may have to be installed for various transit ITS strategies due to limitations from system vendors
Technical Factors	• System compatibility and future upgrade potential • Lack of IT expertise in transit agency to implement ITS due to the lack of understanding of IT in transit • System will get outdated quickly as new technologies come out fast

DKS Associates
TRANSPORTATION SOLUTIONS

FINAL MEMORANDUM

DATE: December 9, 2008

TO: Deena Platman, Metro

FROM: Jim Peters, P.E., P.T.O.E., DKS Associates
Renee Hurtado, P.E., DKS Associates
Jennifer Bachman, DKS Associates

SUBJECT: **TSMO Needs Assessment Methodology** P06097-013

This memorandum articulates how transportation needs that can be addressed through Transportation System Management and Operations (TSMO) should be identified. Three options for needs determination are presented for consideration:

1. graphical presentation of system performance
2. interviews with system operators
3. needs identified in previous plans

Graphical Presentation of System Performance

One of the best ways to show the regional transportation needs of the system is to create maps or other graphics that in essence tell a story about the system. The graphical methods listed here will highlight areas with greater needs and allow the system's operators to visually evaluate the entire system based on specific criteria.

In addition to the graphical options that will be created to help identify areas of need, trends regarding congestion levels, travel times, and traveler delay will be used to demonstrate how the Portland area has changed over the years. These trends will show the importance of working toward innovative solutions to improve the Portland region's transportation system.

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Graphical Option 1: Volume to Capacity Maps

A region wide map of volume to capacity (v/c) ratios will emphasize areas that are congested and close to capacity during the PM peak hours.

Graphical Option 2: Bottlenecks

This graphic or table will identify the worst bottlenecks in the Portland region based on v/c ratios and knowledge from system operators.

Graphical Option 3: Traffic Signal Timing Corridors

A map showing traffic signals that currently have coordinated, traffic responsive or adaptive signal timing will help identify where projects are needed. One way to organize this graphic is to represent each of the following types of corridors in a different color:

- adaptive corridors
- traffic responsive corridors
- corridors with coordinated signal timing implemented within the last 5 years
- corridors with coordinated signal timing implemented more than 5 years ago
- no coordinated signal timing system, but capable equipment
- corridors ideal for coordinated signal timing but missing the appropriate controller equipment or communications between traffic signals

Graphical Option 4: Transit Signal Priority Corridors

This map will show the corridors where transit signal priority currently exists and possibly the corridors where transit signal priority is planned for the future.

Graphical Option 5: Freight Information

This map will identify the freight corridors in the region and the percentage of ADT that is comprised of heavy vehicle traffic.

Graphical Option 6: Freeway and Arterial Incident Locations

The purpose of this graphic (or graphics) is to identify issues regarding incident response and collisions throughout the region. The collision data will primarily focus on freeway crashes for incident response information. Arterial collisions may be investigated as well. These graphics may include:

- incident severity versus duration
- incident types in the Portland region
- map of incidents lasting longer than 90 minutes
- number of lanes affected by incident

- pie charts of type of incident by clearance time (less than 20 minutes, 20 to 90 minutes, and longer than 90 minutes)
- clearance time for fatalities
- rear ends by time of day
- heavy vehicle accidents.

Graphical Option 7: Bicycle Collision Locations

This map identifies high collision locations involving bicyclists to show locations that would benefit from TSMO projects. The information on this map may include:

- location and number of collisions over a given time period
- severity of the collision
- cause of the collision
- environmental factors.

(Note: Accident data collected by the state only includes accidents where a collision took place. In cases where vehicles ran bikes off the road or caused a bike accident without actually striking a bicyclist, the incident was not included in the record.)

Graphical Option 8: Public Parking Facilities

The purpose of this map is to identify locations best suited for advanced parking information systems. This map identifies locations of public parking facilities and potentially the quantity of stalls. Public event facilities will also be included on this map. To determine whether advanced parking information is necessary, several other factors may be illustrated:

- occupancy by time of day
- occupancy by day of week
- occupancy by time of year
- occupancy during special events.

Graphical Option 9: ITS Equipment

This map will show the existing and planned intelligent transportation system (ITS) equipment throughout the Portland metro region.

Graphical Option 10: Communications Infrastructure

This map will show the existing and planned fiber optic cable and twisted pair copper interconnect used throughout the Portland region to support the transportation network and identify gaps in the infrastructure.

Interviews with System Operators

Interviews with system operators will generate a list of transportation system needs based on the experience of the personnel. System operators maintain and operate the roadway system on a daily basis and can readily identify needs not otherwise recognized. Metro already conducted interviews with the following major system operators in the region and summarized the results:

- City of Beaverton
- City of Gresham
- City of Portland Office of Transportation
- Clackamas County
- Federal Highway Administration (FHWA)
- Oregon Department of Transportation (ODOT)
- Port of Portland
- Portland State University (PSU)
- Southwest Washington Regional Transportation Council (RTC)
- Tualatin Valley Fire & Rescue (TVF&R)
- TriMet
- Washington County

Needs Identified in Previous Plans

Previously published studies and unfunded project proposals will identify additional needs that can be addressed through TSMO projects. During their system operator interviews, Metro worked with each stakeholder to identify needs from ITS plans that are still applicable. The TAC will need to provide other studies or funding applications (e.g. MTIP, ODOT Innovative Projects) that include needs addressable by TSMO.

Materials following this page were distributed at the meeting.

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Metro | Agenda REVISED

Meeting: Transportation Policy Alternatives Committee (TPAC)

Date: Friday, January 9, 2009

Time: 9:30 a.m. to 12 p.m.

Place: Room 370A/B

9:30 AM	1.		Call to Order and Declaration of a Quorum	**Robin McArthur, Chair**
9:30 AM	2.		Comments from the Chair and Committee Members	**Robin McArthur, Chair**
9:35 AM	3.		Citizen Communications to TPAC on Non-Agenda Items	
9:40 AM	4.		Future Agenda Items • Regional Transportation Plan Update – System Development • ODOT Safety, Preservation & Bridge Programs • ODOT's Transportation Enhancement Programs • MOVES Update • Review of MTIP Process	**Robin McArthur, Chair**
9:45 AM	5.	*	Approval of TPAC Minutes for December 5, 2008	**Robin McArthur, Chair**
	6.		**ACTION ITEMS**	
9:50 AM	6.1	*	Resolution No. 09-4018, For the Purpose of Consideration of the Regional Travel Options Program Work Plan and Funding Suballocations for Fiscal Year 09-10 – RECOMMENDATION TO JPACT REQUESTED	**Pam Peck**
	7.		**INFORMATION / DISCUSSION ITEMS**	
10:20 AM	7.1	*	Recommendation on Regional Flexible Fund Allocation Options – DISCUSSION	**Ted Leybold**
11:05 AM	7.2	*	Regional Transportation System Management and Operations Refinement Plan Update– INFORMATION	**Deena Platman**
11:25 AM	8.		ADJOURN	**Robin McArthur, Chair**

* Material available electronically.
** Material to be emailed at a later date.
# Material provided at meeting.
All materials will be available at the meeting.

For agenda and schedule information, call Kelsey Newell at 503-797-1916, e-mail: kelsey.newell@oregonmetro.gov.
To check on closure or cancellations during inclement weather please call 503-797-1700.

Updated

BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF APPROVAL OF THE REGIONAL TRAVEL OPTIONS PROGRAM WORK PLAN AND FUNDING SUB-ALLOCATIONS FOR FISCAL YEAR 2009-2010	))))	RESOLUTION NO. 09-4018 Introduced by Councilor Rex Burkholder

WHEREAS, the Metro Council and Joint Policy Advisory Committee on Transportation established funding levels for the Regional Travel Options Program in the 2008-2011 Metropolitan Transportation Improvement Program through the Transportation Priorities funding process; and

WHEREAS, the Metro Council approved a five-year strategic plan for the Regional Travel Options Program in March 2008 that established goals and objectives for the Regional Travel Options Program; and

WHEREAS, the Regional Travel Options Subcommittee of the Transportation Policy Alternatives Committee (TPAC) adopted proposed work plans and funding sub-allocations to TriMet and Wilsonville SMART for Regional Travel Options program activities in fiscal year 2009-2010 on January 9, 2009; and

WHEREAS, the proposed work plans and funding sub-allocations support implementation of the Regional Travel Options Program five-year strategic plan; now therefore

BE IT RESOLVED that the Metro Council hereby approves of the Regional Travel Options Program fiscal year 2009-2010 work plan and funding sub-allocations.

ADOPTED by the Metro Council this 19th day of February 2009.

David Bragdon, Council President

Approved as to Form:

Daniel B. Cooper, Metro Attorney

STAFF REPORT

IN CONSIDERATION OF RESOLUTION NO. 09-4018, FOR THE PURPOSE OF APPROVAL OF THE REGIONAL TRAVEL OPTIONS PROGRAM WORK PLAN AND FUNDING SUB-ALLOCATIONS FOR FISCAL YEAR 2009-2010

Date: December 29, 2008

Prepared by: Pam Peck
Contact No.: 503-797-1866

BACKGROUND

The Regional Travel Options (RTO) Program implements regional policy to reduce reliance on the automobile and promote alternatives to driving for all trips. The program emphasizes all alternative modes of travel and all trip purposes, reflecting policies in the Regional Transportation Plan. The Metro Council approved a five-year strategic plan for the Regional Travel Options program in March 2008 that established goals and objectives for the program.

Key components of the RTO program include a collaborative marketing program, regional rideshare program, transportation management association program, and grant program that provides funds to partner agencies and organizations through a competitive project selection process. Program activities are implemented by partner organizations and agencies, as well as by Metro staff and consultant contracts administered by Metro.

The Metro Council and Joint Policy Advisory Committee on Transportation established funding levels for the Regional Travel Options Program in the 2008-2011 Metropolitan Transportation Improvement Program through the Transportation Priorities funding process. The Regional Travel Options Subcommittee of TPAC is charged with recommending detailed work plans, and grant awards and funding sub-allocations to partner agencies and organizations to support program implementation activities.

The subcommittee adopted the attached proposed work plan for fiscal year 2009-2010 (Attachment 1) at their December 10, 2008 meeting. The work plan continues implementation of the program's five-year strategic plan and includes recommendations for the sub-allocation of program funds to TriMet and Wilsonville SMART. The funding sub-allocations will result in an MTIP amendment that enables TriMet and Wilsonville SMART to apply directly to the Federal Transit Administration for funds to support RTO program implementation activities related to employer and community outreach.

In addition, the work plan budget designates the portion of Metro funds that will be awarded to Transportation Management Associations (TMA), government agencies and non-profit organizations through grants and funding agreements. Attachment 2 provides a summary of RTO grant awards recommended by the RTO Subcommittee of TPAC through a competitive process. TMA grants are not included in the summary, as TMA funds are awarded on an ongoing basis by the RTO Subcommittee to TMAs that meet performance criteria. Grant awards to individual TMAs for fiscal year 2009-2010 will be considered by the RTO Subcommittee in May 2009.

ANALYSIS/INFORMATION

1. **Known Opposition**: None.

2. **Legal Antecedents:**

1991 Federal Clean Air Act Amendments. The need for a comprehensive regional TDM program was addressed in Metro Resolution No. 91–1474 (For the Purpose of Amending the FY 92 Unified Work Program to Include Air Quality Planning Activities), adopted July 25, 1991), in response to the Oregon Transportation Planning Rule and the Federal Clean Air Act Amendments of 1990.

TDM Subcommittee. The TPAC TDM Subcommittee was established by Metro Resolution No. 92–1610 (For the Purpose of Establishing the TPAC Transportation Demand Management Subcommittee), adopted May 28, 1992. Oversight for the development and evaluation of TDM strategies, and formation of final recommendations to Transportation Policy Alternatives Committee (TPAC), Joint Policy Advisory Committee on Transportation (JPACT) and Metro Council concerning TDM planning, programming and implementation activities were assigned to the Subcommittee.

TDM Relationship to DEQ's Ozone Maintenance Plan (Governor's Task Force on Motor Vehicle Emissions Reduction (HB 2214). The task force recommended a base plan focused on specific strategies to maximize air quality benefits. The air quality strategies selected by the region formed the base for a 10-year air quality maintenance plan for the Portland area. The primary TDM transportation control measures (TCMs) in the maintenance plan are the employee commute options program (ECO) and the regional parking ratio program.

Transportation Management Association (TMA) Policy. The policy basis and funding strategy for TMAs was adopted through Metro Resolution No. 98–2676 (For the Purpose of Establishing a Policy Basis and Funding Strategy for Transportation Management Associations (TMAs) For the MTIP/STIP Development Process), adopted October 1, 1998. Metro Resolution No. 99- 2864 (For the Purpose of Selection and Funding Allocation of $1 Million to Transportation Management Associations For FY 2000 to FY 2003), adopted December 2, 1999) allocated regional funding to existing and new TMAs. Metro Resolution No. 02–3183 (For the Purpose of Revising the Regional Transportation Management Association (TMA) Policy to Provide Additional Regional Funding Options for TMAs), adopted May 2, 2002) revised TMA policy by calling for balanced support of existing TMAs with the start-up of new TMAs.

2000 Regional Transportation Plan. The RTP establishes regional TDM policy and objectives to help reduce vehicle trips and vehicle miles traveled. Chapter 1 (Ordinance 00 – 869A-01 (For the Purpose of Adopting the 2000 Regional Transportation Plan; Amending Ordinance No. 96-647C and Ordinance No. 97-715B), adopted August 10, 2000 and Resolution No. 00–2968B (For the Purpose of Granting an Easement to Multnomah County for Non-Park Use Through Metro Property on Troutdale Road at Douglas Cemetery), adopted September 14, 2000), [**DOUBLE CHECK WITH PAM PECK on Resolution No. 00-2968B**]) provides TDM policies and objectives that direct the region's planning and investment in the regional TDM program.

Regional Travel Options 5-Year Strategic Plan. The strategic plan established a new vision for the region's transportation demand management programs and proposed a reorganized and renamed Regional Travel Options program that emphasized partner collaboration to implement an integrated program with measurable results. JPACT and the Metro Council adopted the plan through Resolution No. 04-3400 (For the Purpose of Adopting the Regional Travel Options Program 5-Year Strategic Plan), which also renamed the TDM Subcommittee the RTO Subcommittee, and was adopted on January 15, 2004.

2035 Regional Transportation Plan. The federal component of the plan, pending air-quality analysis, was approved by Metro Council Resolution No. 07-3831B.01 (For the Purpose of Approving the Federal

Component of the 2035 Regional Transportation Plan (RTP) Update, Pending Air Quality Conformity Analysis), adopted on December 13, 2007. The RTP establishes system management and trip reduction goals and objectives that are supported by the RTO program strategies.

Regional Travel Options 5-Year Strategic Plan. The strategic plan established goals and objectives for Regional Travel Options program for 2008 to 2013. JPACT and the Metro Council adopted the plan through Resolution No. 08-3919 (For the Purpose of Adopting the Regional Travel Options 2008-2013 Strategic Plan), adopted on April 3, 2008.

3. **Anticipated Effects**: Sub-allocates $385,220 of RTO program funds to support the TriMet Employer Program and $62,315 to support Wilsonville SMART's Community and Employer Programs in fiscal year 2009-2010.

4. **Budget Impact**s: The proposed budget includes $12,331 in Metro funds to match federal grant funds for that will be used to support program administration, evaluation, and regional rideshare services.

RECOMMENDED ACTION

Staff recommends the approval of Resolution No. 09-4018 as follows:

1. Approval of the fiscal year 2009-10 work plan and budget for the Regional Travel Options program described in Attachment 1 to the staff report, actual budget levels for RTO activities carried out by Metro will be established through the FY 09-10 Metro budget decision-making process.

2. Approval of the funding sub-allocations to TriMet and Wilsonville SMART described in described in Attachment 1 to the staff report.

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Res. 09-4018 Attachment 1

Regional Travel Options Program

FY 2009-2010 work plan

Dec. 10, 2008

Metro | www.oregonmetro.gov

Background

The Regional Travel Options (RTO) Program implements regional policy to reduce reliance on the automobile and promote alternatives to driving for all trips. The program emphasizes all alternative modes of travel and all trip purposes, reflecting policies in the Regional Transportation Plan.

This scope of work identifies the activities and tasks that will be carried out by Metro RTO staff to implement the Regional Travel Options 2008-2013 Strategic Plan in fiscal year 2009-2010. The strategic plan was developed by the RTO subcommittee of the Transportation Policy Alternatives Committee (TPAC) in 2007 and adopted by the Metro Council in March 2008. The strategic plan established the following program goals:

Goal 1: Continue a regional collaborative marketing campaign to increase awareness and use of travel options and reduce drive-alone car trips.

Goal 2: Support employers and commuters to increase the use of travel options for commute trips.

Goal 3: Provide information and services to support increased use of travel options for all trips.

Goal 4: Promote and provide services that support increased use of travel options in local downtowns and centers.

Goal 5: Report progress to aid decision-making and encourage innovation.

Goal 6: Follow a collaborative decision-making structure that provides program oversight and advances the goals and objectives of the Regional Transportation Plan (RTP).

Key program objectives for fiscal year 2009-2010

- Coordinate the regional collaborative marketing program and support implementation of ODOT Drive Less/Save More marketing campaign in the Portland metropolitan area.
- Administer RTO travel options, individualized marketing and Transportation Management Association (TMA) grants and provide technical assistance to grant recipients.
- Coordinate multi-agency employer and commuter outreach activities and support partner collaboration.
- Market CarpoolMatchNW.org and Metro Vanpool to employers and commuters in coordination with the multi-agency employer outreach program
- Work with partner organizations to develop a multi-state, on-line ridematching system, serving Idaho, Oregon and Washington.
- Collect, analyze and report data for each RTO program to ensure that funds are invested in the most cost effective ways

Collaborative marketing

The RTO Collaborative Marketing Program works to increase awareness and use of travel options and to reduce drive-alone car trips. Metro's scope of work will focus on coordination of marketing activities carried out by all RTO partners to maximize the program's effectiveness and reach target audiences identified in the 2008-2013 RTO strategic plan. Partner coordination will be carried through the Collaborative Marketing Working group, the development of a regional events calendar and a regional earned media calendar.

Overall management of the Drive Less/Save More Marking Campaign will shift from Metro to ODOT in June 2009. Metro RTO staff will continue to support implementation of the campaign in the Portland metropolitan area through development and coordination of earned media activities that highlight RTO programs, direct outreach at up to twelve community events selected in coordination with RTO partners, and the development of local campaign sponsors and partnerships. RTO staff will look for opportunities to collaborate with Metro's Sustainability Center to coordinate campaign outreach with other social marketing programs. In addition, Metro staff will also act as the liaison to the statewide effort and will disseminate campaign tools and information to RTO partners.

RTO staff will also work to promote the benefits of bicycling and walking and to increase the use of these modes for transportation purposes. Activities in this area will include disseminating safety messages and information and promoting the use of regional trails for transportation purposes. RTO staff will coordinate activities in this area with staff from Metro's Long-Range Transportation Planning and Trails Planning work groups and the regional Connecting Green Initiative. Marketing and promotions in this area will focus on Metro's Bike There! and Walk There! programs.

Metro RTO staff will provide project oversight, support sales, marketing and distribution, and implement marketing strategies for the regional Bike There! map. The Bike There! map will be updated in FY 09-10 with additional support from Metro's Long-Range Transportation Planning section and in coordination with the Regional Trails Program to include updated bicycle suitability and safety information. Funds for printing the updated map were generated by the sales of the map over the previous three years.

Metro, Kaiser Permanente and other partners distributed more than 35,000 free copies of the Walk There! guidebook in FY 08-09. Metro is in discussions with Kaiser Permanente about making the program self-sustaining by reprinting the publication in early 2009 and selling a portion of the books (some books would continue to be provided for free through Kaiser's community health programs). In addition, Metro and Kaiser are exploring the development of a series of up to 20 community walking events to promote walking for short trips and use of regional trails for transportation purposes. If Kaiser provides funds for these projects in FY 08-09, Metro RTO staff will provide project oversight, support sales, marketing and distribution, and coordinate any remaining walking events in FY 09-10. Revenue from the guidebook sales will be used to support the development and printing of future editions.

Metro RTO collaborative marketing staff will be the primary Metro staff contact for RTO individualized marketing grants, as well as for any travel options grants that have a relationship to the collaborative marketing program. In this capacity RTO staff will review progress reports, compile comprehensive progress reports for the RTO Subcommittee and the FTA, and work with the RTO financial analyst to recommend payment of grant invoices. Metro RTO program staff, augmented by contracted professional services, will carry out the following tasks:

- Support marketing working group for effective coordination and partner communication.
- Support implementation of ODOT's Drive Less/Save More campaign in the Portland metropolitan area, coordinate earned media opportunities, represent the campaign at up to twelve community events, disseminate campaign information to RTO partners, and act as liaison to ODOT.
- Develop regional calendar of events, coordinate presence of RTO partners and provide staff support for one community event per month.
- Research and develop white papers and fact sheets to support consistent messaging in RTO marketing activities.
- Develop RTO collateral materials consistent with the Drive Less/Save More campaign, including fact sheets, brochures, web pages, and other collateral materials.
- Provide oversight for Metro's regional Bike There! map product, implement map marketing strategies, oversee sales and distribution, and support collaboration with local and regional partners related to development of bike maps.
- Provide oversight for Metro's regional Walk There! guidebook, implement marketing strategies, oversee sales and distribution, and support collaboration with local and regional partners related to the promotion of walking for short trips.
- Review progress reports for individualized marketing projects and travel options grants related to collaborative marketing activities, compile comprehensive progress reports, and work with the RTO financial analyst to recommend payment of grant invoices.
- Coordinate collaborative marketing activities with other Metro departments to leverage resources and further disseminate program messages.

Key milestones for FY 09-10

- September 09 – Earned media and events calendars for next quarter completed.
- December 09 – Earned media and events calendars for next quarter completed.
- March 10 – Earned media and events calendars for next quarter completed.
- June 10 – Earned media and events calendars for next quarter completed.

Deliverables

- RTO collateral materials
- RTO events calendar
- RTO earned media calendar
- Updated Bike There! map
- Quarterly progress reports

Commuter services

The 2008-2013 Regional Travel Options Strategic Plan calls for increased efforts to coordinate the outreach activities of partner's employer and commuter programs. The intended outcomes include avoiding duplication of effort, leveraging resources, and more strategic delivery of services to locations where the greatest impact can be attained. Employer and commuter programs are projected to reduce approximately 47,660,000 vehicle miles of travel per year during the plan timeline.

Currently, the following partners carry out employer and commuter programs: Metro, Oregon Department of Environmental Quality (DEQ), TriMet, Wilsonville SMART, Vancouver Commute Trip Reduction Program, Portland Transportation Options and Transportation Management Associations (TMAs).

A large portion of employer outreach is generated by the Employee Commute Options (ECO) program. The DEQ is responsible for oversight and implementation of the ECO program (OAR 340.242). In its current form, this program mandates that Portland-region businesses with over 100 employees at a given worksite must have a plan in place which aims to reduce by 10 percent from an established baseline the number of drive-alone auto trips to that worksite. This regulation has been in effect in the Portland region since 1996.

The DEQ, TriMet and other regional partners are currently working with 787 affected businesses, 85 percent of which are in compliance, which represents 668,000 employees (35 percent) of the region's employees, making this an effective means of conducting outreach to businesses around the region. This work plan builds on the existing ECO program framework and will encourage all employers working with RTO partners to achieve the 10 percent reduction goal and to use a survey similar to the ECO survey to measure progress.

RTO staff will explore opportunities to collaborate with Metro's Sustainability Center to better integrate agency employer outreach efforts, leverage investments in technology, and coordinate messages.

Metro will continue management of the regional vanpool program and provide subsidies to eligible groups of commuters. Beginning in FY 09-10, C-TRAN will no longer provide funding to Metro to subsidize Washington-based vans and will instead begin operation of their own vanpool fleet. Metro will continue to work closely with C-TRAN to market their vanpools to Portland area employers. Metro will begin work in January 2009 to release a new RFP for vanpool lease providers, building on lessons learned during 06-09 vanpool contract period.

Metro RTO program staff, augmented by contracted professional services, will carry out the following tasks to coordinate the employer program and provide commuter services:

- Coordinate partner outreach activities, facilitate communication between partners and identify a lead agency or organization for each employment site.

- Develop a standardized approach to conducting, tracking and evaluating employer outreach activities.
- Identify target markets and business sectors.
- Add to and standardize the amount of data collected on employer efforts.
- Create a web-based resource for employers in the Drive Less web site that links them to RTO partner programs and services.
- Implement a regional employer recognition program.
- Utilize and maintain a shared contact management database to track employer program contacts and outcomes.
- Provide assistance to other partners at strategically selected outreach events.
- Provide lead role in working with businesses needing rideshare assistance.
- Provide initial response to phone or web-generated contacts; assess level of interest and coordinate hand-off to appropriate external partner.
- Maintain ridematching database, create scatter maps and other outreach tools and collateral materials as needed.
- Review progress reports for travel options grants related to employer outreach activities, compile comprehensive progress reports, and work with the RTO financial analyst to recommend payment of grant invoices.
- Collaborate with Metro's Sustainability Center to better integrate agency employer outreach efforts, leverage investments in technology, and coordinate messages.

Key milestones for FY 09-10

- September 09 – Implementation of contact management database
- September 09 – Employer outreach coordination plan complete
- September 09 – Quarterly report completed
- December 09 – Collateral materials web site online (ongoing development)
- December 09 – Quarterly report completed
- March 10 – Quarterly report completed
- June 10 – Quarterly report completed

Deliverables

- Plan for standardizing, conducting and evaluating employer outreach activities.
- Contact management database.
- Collateral materials and web information
- Employer outreach calendar.
- Quarterly progress reports.

Traveler information tools

This program activity serves to provide information and services supporting increased use of travel options for all trips. In FY 09-10 RTO staff will continue to work with partner organizations led by Washington State Department of Transportation (WSDOT) to develop a multi-state, on-line ridematching system, serving Idaho, Oregon and Washington. The proposed system will be an off-the-shelf program procured by WSDOT to replace a variety of systems currently in use by transit and rideshare agencies in the Northwest. This system will replace Metro's existing system, CarpoolMatchNW.org. Initial implementation is expected to take place late summer/fall 2008 with various system expansions taking place over the next two to three years. Development of a new marketing and outreach effort will be conducted, potentially at the state level in concert with other rideshare agencies and Oregon Department of Transportation (ODOT).

Metro RTO staff will carry out the following tasks in 09-10:

- Continue discussions Oregon Department of Transportation (ODOT) staff to expand their involvement and commitment to marketing and operation of the regional rideshare system.
- Work with WSDOT on implementation issues related to the new rideshare system.
- Establish contracts and agreements related to rideshare system operations and maintenance.
- Review progress reports for travel options grants related to traveler information tools, compile comprehensive progress reports, and work with the RTO financial analyst to recommend payment of grant invoices.

Key milestones for FY 08-09

- September 09 – Quarterly report completed
- December 09 – Quarterly report completed
- December 09 – Ridematching system implementation and agreements
- March 10 – Quarterly report completed
- June 10 – Quarterly report completed

Deliverables

- Ridematching system
- Quarterly progress reports

Downtowns and centers

The Regional Travel Options Program promotes and provides services that support increased use of travel options in local downtowns and centers by supporting grants to local jurisdictions, non-profit groups and public private partnerships. The RTO program provides ongoing support to six area Transportation Management Association (TMAs). TMAs are nonprofit coalitions of local businesses and/or public agencies that work in centers and employment areas to strengthen partnerships with businesses to reduce traffic congestion and pollution by improving commuting options for their employees. The RTO Subcommittee will consider the results of a South Waterfront TMA feasibility study in FY 08-09. If the Subcommittee approves regional start-up funding for this TMA, Metro will provide services to seven TMAs in FY 09-10.

Metro RTO staff will carry out the following tasks related to downtowns and centers program objectives:

- Provide technical assistance for TMA project planning, implementation and evaluation activities.
- Develop work plans for each TMA that support the unique character of each area and recognize that each area is at a different level of development and has a unique mix of transportation infrastructure.
- Develop and manage TMA funding agreements.
- Coordinate meetings of TMA directors.
- Track TMA performance toward meeting outreach and performance targets.
- Provide progress reports to the RTO subcommittee.

Additional downtowns and centers objectives will be carried out through the Regional Travel Options grant program. Grant program tasks, milestones and deliverables are described in the program administration portion of this work plan.

Key milestones for FY 09-10

- Sept 09 – TMA directors meeting held
- Jan 10 – TMA directors meeting held
- March 10 – TMA directors meeting held
- May 10 – TMA work plans and booster grant proposals presented to RTO Subcommittee.
- June 10 – TMA work plans and contracts finalized.

Deliverables

- TMA work plans and agreements
- Quarterly progress reports

Measurement

This program collects, analyzes and reports data for each RTO program to ensure that funds are invested in the most cost-effective ways. Evaluation reports are used to refine program development, marketing and implementation. RTO program staff will be responsible for carrying out Goal 5 (Measurement) of the RTO Strategic Plan and the RTO Evaluation Framework, approved in 2007.

The Evaluation Framework guides the level of analysis for each type of RTO project. It also clarifies that both RTO staff and RTO-funded partners have a key role in data collection. RTO will continue to use independent researchers to evaluate the program.

Metro's Travel Research and Modeling staff and Data Resource Center staff will be called upon to consult on the development of new research methods and tools.

Metro RTO staff will carry out the following tasks related to measurement and evaluation in FY 09-10:
:

- Conduct on-going data collection and tracking for RTO-funded programs.
- Disseminate findings from the independent evaluation of RTO programs completed by PSU in FY 08-09.
- Provide technical assistance to all RTO-funded partners.
- Develop information-sharing partnerships.
- Explore new methods and tools for storing data, analyzing data and reporting.

Key milestones for FY 09-10

- Present findings from the independent evaluation of RTO programs completed by PSU in FY 08-09.

Deliverables

- Data is collected and methods and databases improved.
- Technical services provided to RTO partners.
- Information-sharing partnerships are developed.

Policy, funding and program administration

This scope of work supports the program structure called for by the strategic plan including administration and management of RTO program functions by Metro.

The RTO program staff will:

- Chair and support RTO Subcommittee of TPAC, including logistics, scheduling and production of meeting summaries.
- RTO Subcommittee research and support on technical and financial issues.
- Create presentations about RTO program for Metro committees and regional partners.
- Administer contracts and agreements for RTO programs.

- Develop and submit FTA application for CMAQ grant funds and administer grants for RTO programs.
- Identify local matching funds sources for future years.
- Complete Business Energy Tax Credit (BETC) applications for the vanpool program.
- Develop the RTO work plan and program budget for fiscal year 10-11.
- Provide local transportation system plan support on achieving 2020 non-SOV targets.
- Provide staff support for demand management and parking components of the Regional Transportation Plan Update and the Transportation System Management and Operations (TSMO) policy update.
- Represent RTO program at Metro committees and jurisdictions and agency meetings.

Key milestones for FY 09-10

- Nov 09 – FY 09-10 work program and budget reviewed and adopted by RTO subcommittee
- Feb 10 – FY 09-10 work program and budget reviewed and adopted by TPAC, JPACT and the Metro Council
- June 10 – Submit BETC applications for FY 09-10 projects.

Deliverables

- FY 10-11 budget
- RTO subcommittee meeting summaries
- Quarterly progress reports

RTO BUDGET 2009-2010				
Revenues: (as of 7-1-2008)	**08-09 Available**	**(BUDGETED) FY 09-10**		**Totals**
		#14442		
	-	1,800,000		1,800,000
MTIP Key 14441	681,125	615,737		615,737
MTIP Key 14443	380,000	-		-
Bike There! (Current year sales)	-	17,510		17,510
Walk There! (Current year sales)	-	60,000		60,000
Walk There! (Current Year Grant)	-	10,000		10,000
Metro match (General Fund)		12,331		12,331
Fund Balance:				
BETC (prior years)	50,000	50,000		50,000
Total Revenue to/from Metro:	1,111,125	2,565,578		2,565,578
Expenditures:	**FTE**	**(BUDGETED) FY 09-10**		**Totals**
Administration:				
FTE	0.758	104,657		104,657
M & S		10,106		10,106
Evaluation and Measurement:				
FTE	1.500	167,513		167,513
M & S		11,192		11,192
Collaborative Marketing:				
FTE	1.220	102,977		102,977
Sponsorships		22,054		22,054
M & S		56,238		56,238
Commuter Program:				
FTE	1.500	144,993		144,993
TriMet		385,220		385,220
SMART		62,315		62,315
Ridematch		50,000		50,000
M & S		60,281		60,281
RTO Grants:				
FTE	0.600	85,879		85,879
Travel Options		262,500		262,500
Individualized Marketing		356,000		356,000
TMA:				
FTE	0.500	73,964		73,964
TMA Grants		153,000		153,000
Booster Grants		125,000		125,000
South Waterfront		75,000		75,000
Regional Vanpool:				
FTE	0.500	73,989		73,989
M & S		182,700		182,700
Total expenditures	6.578	2,565,579		2,565,579
Budget Surplus/(Shortfall)		(0)		(0)
Partners Match:				
Partners match		237,059		237,059
Total Match:		237,059		237,059
Total Expense		2,802,638		2,802,638

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Metro | *Memo*

Date: December 29, 2008

To: TPAC

From: Pam Peck, Metro RTO Manager

Re: **RTO Subcommittee Grants Awards Summary**

Background

The Regional Travel Options (RTO) program carries out regional strategies to increase use of travel options, reduce air pollution and carbon emissions, and improve mobility. The RTO program receives federal Congestion Mitigation and Air Quality (CMAQ) funds through the regional Flexible Funds decision-making process. The CMAQ funds are used to support grants to local jurisdictions and non-profit organizations to advance RTO program objectives. Projects must be carried out within the Metro boundary, which includes the urbanized portions of Clackamas, Multnomah and Washington counties.

The RTO Subcommittee of TPAC conducts a competitive process to select projects for RTO grant funding. In 2008, the Subcommittee established two grant categories with unique scoring and selection criteria, a general category for projects that will be carried out from July 2009 to June 2011, and an individualized marketing category for projects that will be carried out from March 2009 to June 2012. Proposals were scored by a Subcommittee working group and a package of proposed grant awards in each category was forwarded to the RTO Subcommittee for approval. This memo summarizes the grant awards in each category adopted by the Subcommittee at November 12, 2008 meeting.

Travel options grants

Regional projects

Program and recipient	Grant award	Project description
Multi-Modal Trip Planner TriMet	$68,930	The project will test the usability of an Open Source Multi-Modal Trip Planner System which is expected to increase mode share for bike, walk, and transit trips during peak commute hours while decreasing drive-alone trips.
Bike Commute Challenge BTA	$25,000	The BTA bike commute challenge-work place against workplace-to see who can get the most people biking in September. Any business, non-profit or public agency is eligible to participate. Individual cyclists may also participate. This program reduces single-occupant vehicle use and traffic congestion and improved air quality by encouraging people to try bike commuting.
Carefree Commuter Challenge WTA	$38,000	The Carefree Commuter Challenge is a regional auto trip reduction program creating excitement, competition and camaraderie at the workplace. WTA staff provides a turn-key trip reduction program to employers to help them motivate employees to take transit, bike, walk, carpool, vanpool and telecommuting instead of driving alone.

TriMet Bike Park TriMet	$50,000	TriMet will install electronic-access bike lockers at Beaverton Transit Center with space for 22 bikes and evaluate their effectiveness as a strategy for encouraging bicycling to transit. Evaluation will include the controlled-access bike parking facility at the Portland State University light rail station. As 39% of MAX bike passengers would drive if they did not have a bike-transit option, this project will increase the number of bicycling and transit trips while decreasing drive-alone trips.

Local projects

Program and recipient	**Grant award**	**Project description**
Lloyd Links Lloyd TMA	$41,445	Lloyd Links will link Lloyd employees from the residence to their Lloyd work sites via personal contact and direct one-on-one assistance. This is coupled with education, promotion, incentives and evaluation.
Sunday Parkways City of Portland	$30,000	Sunday Parkways provide a car-free environment where families, cyclist, walkers and others can enjoy our streets and parks. Sunday Parkways reduce auto trips, improve air quality, increase the health and activity levels of residents and increase the awareness and acceptability of bicycling and walking as modes of travel in Portland. The grant will support three (3) Sunday Parkways in North and Northeast Portland in 2009.
Tigard Bike Map City of Tigard	$20,000	This project will replace the long outdated Tigard-area bike map published in 1983, with an upgraded and enhanced city bike-route map. The map would supplement the current Metro Bike There! Map, which provides limited coverage of Tigard and includes few low traffic (green) and moderate traffic (yellow) street designations in comparison with other areas. The inclusion of other information as grades, key neighborhood trails accessways, bus stops, transit and how to access transit, including commuter rail, will make it easier for bicyclists to use the bicycle for all types of transit trips. The map is part of a city strategy to make bicycling safer and more convenient through a variety of efforts.
Bike Racks for Commuters WTA	$15,000	Bike Racks for Commuters program will make staple racks available to businesses that participate in the WTA's Westside Commuter Club and will offer $100 toward installation or city fees. Employers can add funding if there is a greater need for more than two racks. Employees will be encouraged to try cycling with well-sited bike parking on company property.
Wilsonville Bike/Ped Coordinator Wilsonville SMART	$80,000	The project will expand the SMART Options program by hiring a Bike and Pedestrian Coordinator who will implement priorities set forth in the City if Wilsonville's Bicycle and Pedestrian and Transit Master Plan. As well as creating tools, such as maps and brochures, this person will build on the established community walking and biking programs to engage the growing community interest and establish a structured program similar to the City of Portland's "Options Ambassadors".
Swan Island TNT (Trip Not Taken)	$28,000	The project seeks to reduce vehicle miles traveled by encouraging Swan Island employees to relocate to adjacent neighborhoods in

Swan Island TMA		North and inner Northeast Portland and by helping residents of those neighborhoods find job and career opportunities on Swan Island.
Gresham Way Finding City of Gresham	$50,000	The City of Gresham will install a network of pedestrian and bicycle way-finding signs to aid travelers in finding the locations of local amenities and facilities. The signs will include arrows and distance markers. The City will also produce a bicycle map for the Gresham area that will show bicycle routes and amenities.
Diverse Cultures Cycling Needs Assessment and Pilot Project Community Cycling Center	$78,625	The proposed project aims to increase the awareness and acceptability of bicycling as a transportation option among minority and low-income participants in North and Northeast Portland by creating a culturally-specific program to meet the unique needs of a diverse community. The project will reach 250 people through ten community organizations included in a culturally-appropriate needs assessment. Results will be applied to develop a pilot program to increase bicycle trips and reduce car trips among these target audiences.

Individualized marketing grants

Individualized marketing projects identify people within a specific geographic area who want to change the way they travel. The projects use personal, individualized contact to motivate travel behavior change. Projects in Portland and more than 300 cities around the world have achieved significant reductions in the number of people driving alone and increased the number of people cycling, walking and using transit.

Recipient	Grant award	Project	Timeline
City of Portland	$200,000	North/Northwest SmartTrips (approx. 25,000 households)	Spring 2009 to Fall 2009
City of Gresham	$100,000	Project will target residents who live within one-half mile of the Civic Drive MAX Station (approx. 6,500 households)	Spring 2009 to Fall 2011
City of Portland	$300,000	Green Line SmartTrips (approx. 27,000 households in east Portland adjacent to MAX Green Line)	Summer 2009 to Fall 2010
City of Wilsonville SMART	$228,480	Project will target residential areas of Wilsonville (approx. 5,942 households)	Summer 2010 to Fall 2011
City of Portland	$171,520	Street Car Loop and South Waterfront SmartTrips (approx. 20,000 households, contingent on completion of Street Car Loop project)	Winter 2011 to Spring 2012

For more information

Contact Pam Peck, Metro RTO Manager, at Pam.Peck@oregonmetro.gov or 503-797-1866.

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Metro | *Memo*

Date: January 8, 2009

To: TPAC and Interested Parties

Cc:

From: Amy Rose, Associate Transportation Planner

Re: Project packages demonstrating policy priority trade-offs

The attached table is provided to demonstrate visually how the policy trade-offs might impact creation of a final list of projects for regional flexible funds. Four examples were created to show different combinations of projects that meet the narrowing factors with varying policy emphases. These are intended to further illuminate the policy trade-offs needing consideration in creating a final recommended list, but are not to be considered recommendations themselves, but could be used as a basis for crafting a final recommendation. The packages are discussed individually below.

Bike/Pedestrian Construction & Top Tier

This package is made up of projects that are in the top tier and that emphasize meeting the bike/pedestrian minimum through funding construction projects. While this package does not fund a project in every sub-region, the second tier 40-Mile Loop bike/pedestrian project does add an East Multnomah County project to the package. The package does not include a Clackamas County project. After fully funding the selected projects, remaining funds are allocated to the Bus Stop Development program to sustain this work that is constructed across the region. This option as shown is over the target by $17,726 and has a bike/pedestrian total of $7,113,101.

Bike/Pedestrian Development & Top Tier

This package is made up of projects that are in the top tier and that emphasize meeting the bike/pedestrian minimum through funding development of projects. This combination of projects does not fund projects throughout the region. After fully funding the selected projects, remaining funds are allocated to the Bus Stop Development program to sustain this work that is constructed across the region. This option as shown is over the target by $8,149, and meets the bike/pedestrian target of $7.2 million.

Qualitative note: The Willamette greenway trail involves coordination with Union Pacific (UP) Rail Road. Alignments that do not include UP property may be sought as direction to a master plan process.

Region & Bike/Pedestrian Minimum

This combination has projects that provide construction projects throughout the region and meets the bike/pedestrian minimum. In order to fund projects throughout the region, the package does not include the top tier 102nd Avenue project because it is one of two top tier projects in the mixed-use area implementation category and one of three top tier projects in the Portland sub-area. Another approach to create funding capacity for bike/pedestrian projects and fund projects throughout the region would be to fund 102nd Avenue instead of St. Johns Rail line or the School Bus Diesel Engine emission reduction project. This change would require corresponding changes to amounts allocated to other second tier projects or project development work. After fully funding

the selected projects, remaining funds are allocated to the Bus Stop Development program to sustain this work that is constructed across the region. This option as shown is $1,209 under the target amount and exceeds the bike/pedestrian minimum.

Qualitative note: The Willamette greenway trail involves coordination with Union Pacific (UP) Rail Road. Alignments that do not include UP property may be sought as direction to a master plan process.

Top Tier & Region

This package would fund projects that are mostly in the top tier, primarily construction oriented and are spread throughout the region by including McLoughlin Blvd, a second tier project, not including the Bus Stop Development and Streamline Program and by limiting the number of development projects. This option as shown falls short of meeting the bike/pedestrian minimum at $4,638,315, and is $155,192 under the total target allocation amount.

Scale Regional Projects

There is also potential for scaling the Bus Stop Development program or the School Bus Diesel Emission Reduction project to change the allocation between these candidates or to adjust funding capacity for proposed changes to any of the packages outlined above.

2010-2013 Regional Flexible Fund - Project packages demonstrating policy priority trade-offs

Category	Tier	Project name	Request (2012 dollars)	Bike/Ped Construction & Top Tier	Bike/Ped Development & Top Tier	Region & Bike/Ped Min	Top Tier & Region
Regional mobility corridors	1st tier	**NE/SE Twenties Bikeway: Lombard - Springwater Trail**	$2,097,850	$2,097,850	$2,097,850	$2,097,850	$2,097,850
	2nd tier	Bus Stop Development & Streamline Program	$3,640,874	$1,100,000	$1,000,000	$2,280,000	
		Hogan/NE 242nd Dr: Glisan - Stark	$3,213,308				
		Westside Trail: Kaiser Ridge Park - Kaiser Woods Park	$2,692,830	$2,692,830	$2,692,830		
		Farmington Road at Murray Blvd Intersection	$4,002,099				
		40 Mile Loop: Blue Lake Park - Sundial Rd	$2,322,421	$2,322,421		$2,322,421	$2,322,421
	3rd tier	**Kerr Parkway Bike Lanes: Stephenson - Boones Ferry Rd**	$1,742,926				
Mixed-use area implementation	1st tier	SW Rose Biggi: Hall - Crescent	$2,758,238	$2,758,238	$2,758,238	$2,758,238	$2,758,238
		102nd Ave: NE Glisan - SE Washington	$5,000,000	$5,000,000	$5,000,000		$5,000,000
	2nd tier	McLoughlin Blvd: Clackamas River Bridge - Dunes Dr	$3,401,868			$3,401,868	$3,401,868
		Red Electric Trail: SW 30th - SW Vermont	$1,929,183			$1,929,183	
		N Fessenden/St Louis: Columbia Way - Lombard	$2,159,431				
		Killingsworth: N Commercial - NE MLK Jr Blvd	$2,354,093				
	3rd tier	SE Division: 6th - 39th	$2,500,000				
	4th tier	**OR 43: Arbor Dr - Marylhurst Dr**	$3,800,097				
Industrial & employment area implementation	1st tier	St Johns Rail Line (UP): N St Louis - N Richmond	$3,649,337	$3,649,337	$3,649,337	$3,649,337	$3,649,337
	2nd tier	Evergreen Rd: 253rd Ave - 25th Ave	$2,620,100				
Environmental enhancement & mitigation	1st tier	School Bus Diesel Engine Emission Reduction	$2,047,050	$2,047,050	$2,047,050	$2,047,050	$2,047,050
	2nd tier	Electronic Mini-Hybrid Bus Retrofit	$1,345,950				
	3rd tier	Transit Bus Diesel Engine Emission Reduction	$1,166,490				
Project development		**French Prairie Bridge: Boones Ferry Rd - Butteville Rd**	$1,250,000		$1,250,000		
		Airport Way at 82nd Ave Intersection	$500,000				
		SE 174th: Jenne - Giese	$222,500				
		Council Creek Trail: Banks - Hillsboro	$448,650		$218,044	$218,044	$218,044
		Willamette Greenway Trail: N Columbia Blvd - Steel Bridge	$444,800		$444,800	$444,800	
		SE Division: 96th - 174th	$500,000		$500,000	$500,000	
			$57,810,095				
			$21,650,000	**$21,667,726**	**$21,658,149**	**$21,648,791**	**$21,494,808**
		Over/under target	-$17,726	-$8,149	$1,209	$155,192	
		Bike/Ped min	$7,113,101	$7,203,524	$7,512,298	$4,638,315	

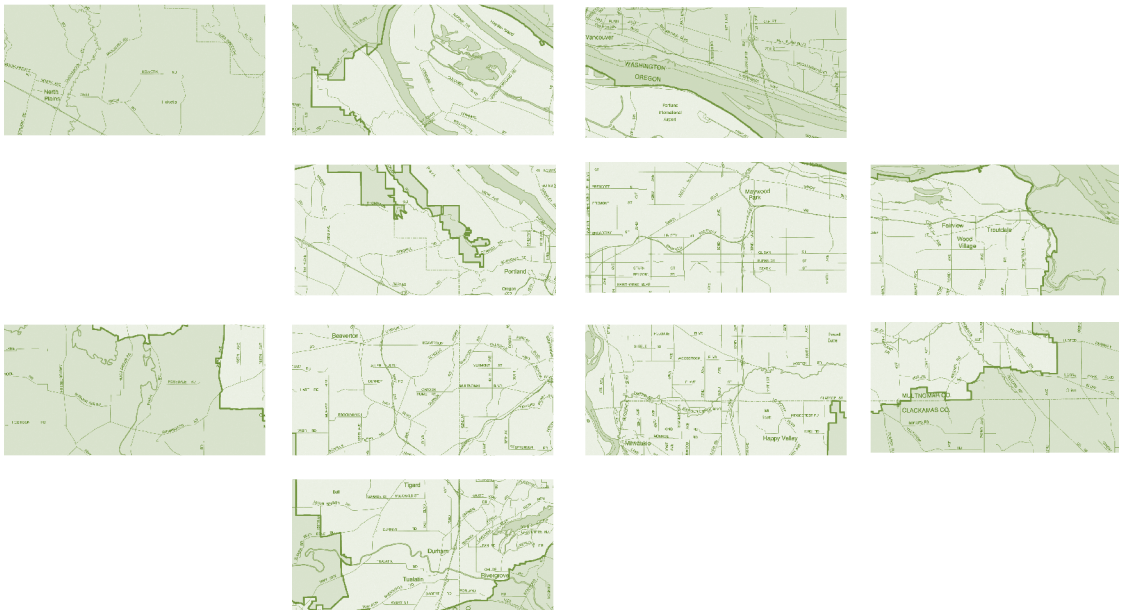
Notes:

Tiers reflect clear break points between groups of projects with similar scores resulting from the quantitative analysis.

Bike/ped projects shown in bold.

Minimum of $7.2 million to be allocated to bike/pedestrian projects

CLICK HERE FOR REPORT



Transportation projects and programs

2010-13

Regional flexible fund allocation

Public comment executive summary

December 2008

Metro | *Joint Policy Advisory Committee on Transportation*

Updated

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Metro | *Memo*

Date: January 9, 2009

To: Transportation Policy Alternatives Committee & Interested Parties

From: Deena Platman, Principal Transportation Planner

Re: Regional Transportation System Management & Operations (TSMO) Plan Update

Background
Metro was awarded a Transportation and Growth Management Grant to conduct a refinement planning process for regional transportation system management and operations (TSMO). The planning effort was deemed necessary in order to develop a comprehensive understanding of how system management and operations opportunities can help the region address its transportation challenges and to develop a regional vision and strategy for implementing TSMO. The plan is being developed in collaboration with the 2035 Regional Transportation Plan (RTP). Its vision, goals, and strategies will be incorporated into the state component of the 2035 RTP. The project goals include:

- Refining the *2035 RTP* goals, objectives and actions related to system management;
- Developing policy direction on where, when, and how TSMO strategies are applied and financed in the region;
- Enhancing the region's capacity to consider TSMO in concert with more traditional capital projects;
- Prioritizing TSMO projects for regional funding;
- Actively facilitating communication between interested stakeholders with diverse perspectives on TSMO.

Technical Team and Advisory Committees
The project greatly benefits from a seasoned consultant team lead by DKS Associates, which includes assistance from Kittelson & Associates, Angelo Planning, and Jeanne Lawson & Associates.

TransPort, the TPAC subcommittee for system management and operations, provides technical expertise to the planning effort. This includes initial input and review of work products with a particular focus on the TSMO toolbox, needs assessment, and action plan of TSMO priorities. TransPort provides input at both its monthly meetings and between meetings. TransPort will make plan recommendations to TPAC.

The TSMO Policy Work Group provides policy level input into the plan development. Members will review and comment on work products prepared by Metro and the consultant team and help guide plan recommendations that will be brought forward to TransPort, TPAC, JPACT, and Metro Council. The work group is comprised of representatives from public and private organizations with a stake in effective management and operation of the transportation system. A roster of members is provided in Attachment A. Tom Kloster, Metro Transportation Planning Manager, chairs the work group meetings. The work group will meet up to six times over the course of the planning project. The group held their first meeting on November 24, 2008. The group meets again on January 26, 2009.

Major Tasks and Timeline
The Regional TSMO Refinement Plan project officially kicked off in early September 2008 and is anticipated to be completed by August 31, 2009. Attachment B provides a timeline of major tasks and activities.

Following is a list and brief description of the major tasks to be completed.

- TSMO Vision, Goals and Objectives – Develop a clear vision with supporting goals and measurable objectives for the implementation of TSMO strategies in the Portland metropolitan region.
- TSMO Toolbox – Create an information resource with a menu of options that stakeholders can easily understand and can serve as an "idea kit" for identifying solutions.
- Regional TSMO Needs Assessment – Create and implement a methodology for assessing TSMO needs across the region.
- TSMO Finance – Identify issues and strategies for financing TSMO strategies in the region.
- TSMO Action Plan – Develop and implement a process to identify a set of prioritized TSMO projects that can be incorporated into the 2035 RTP and funded using the MTIP programmatic funds for TSMO.
- 2035 RTP Products – Prepare amendments to the 2035 RTP and the 2010-2013 MTIP as needed; could include revisions to policy and system investment list.
- ITS Architecture Update – Update the current regional Intelligent Transportation System (ITS) Architecture document as needed to accommodate revised and new strategies identified in the planning process.
- Plan Document – Document the TSMO planning process through a compilation of all final products.
- Plan Adoption – Approval by JPACT and the Metro Council.

Accomplishments to Date
The project is on-schedule and some of the initial products are under review by the advisory committees.

TSMO Vision, Goals and Objectives
Attachment C includes the latest version of the TSMO vision, goals, and objectives. TransPort developed the initial vision and goals over several meetings and the TSMO Policy Work Group provided detailed input as well. At its January 9th meeting, TPAC will be asked to comment on the draft language.

TSMO Toolbox
Attachment D is the TSMO Toolbox memorandum prepared by Kittelson and Associates. TransPort provided extensive comments on the development of this toolbox in addition to research of other national and international examples conducted by the consultant.

Needs Assessment Methodology
Attachment E is the TSMO needs assessment methodology memorandum, which describes the process for identifying system needs. The project team is well underway with implementing the process, working in coordination with TransPort to secure needed data.

Attachment A

Regional Transportation System Management and Operations Refinement Plan

Transportation System Management & Operations (TSMO) Policy Work Group Roster

Work Group Member		Affiliation
Tom	Clemo	Tualatin Valley Fire and Rescue
Marie	Dodds	AAA
Patty	Fink	Coalition for a Livable Future
Bob	Hart	SW RTC
Eric	Hesse	TriMet
Karla	Keller	ODOT – Region 1
Bill	Kloos	City of Portland - Operations
Tom	Kloster	Metro - Chair
Jay	McCoy	City of Gresham
Jane	McFarland	Multnomah County
Galen	McGill	ODOT - Salem
Margaret	Middleton	City of Beaverton
Louis	Ornelas	TPAC Citizen Member
Wilda	Parks	North Clackamas Chamber of Commerce
Pam	Peck	Metro
Nathaniel	Price	FHWA
John	Reinhold	TPAC Citizen Member
Bob	Russell	Oregon Trucking Association
Paul	Smith	City of Portland - Planning
Tom	Tushner	Washington County
Ron	Weinman	Clackamas County
Technical Team		
Deena	Platman	Metro – Project Manager
Josh	Naramore	Metro – Associate Planner
Jim	Peters	DKS Associates – Consultant/Manager

Attachment B

Regional Transportation System Management and Operations Refinement Plan

Timeline of Major Tasks

Month	Major Tasks								
Sept 08	Task 1: Public Participation & Technical Coordination	Task 2: Regional TSMO Vision Policy WG #1	Task 3: TSMO Toolbox						
Oct 08				Task 4: TSMO Needs Assessment					
Nov 08					Task 5: Finance				
Dec 08									
Jan 09				Policy WG #2		Task 6: TSMO Action Plan			
Feb 09									
Mar 09					Policy WG #3				
Apr 09									Task 9: TSMO Refinement Plan (If needed) Policy WG #5 Policy WG #6
May 09						Policy WG #4		Task 8: ITS Arch. Update	
Jun 09							Task 7: RTP Products		
Jul 09									
Aug 09									

Role of Transport: Provides technical expertise to the planning effort; has initial input and review of work products with a particular focus on technical aspect such as the TSMO toolbox, needs assessment, and prioritization criteria. TransPort will provide input at its monthly meetings for the duration of the project. TransPort makes recommendations to TPAC, JPACT, and Metro Council.

Role of TSMO Policy Work Group: Provides policy level input; reviews and comments on work products and guides recommendations to TransPort, TPAC, JPACT, and Metro Council. The TSMO Policy Work Group will meet up to six times during the project.

1/9/08 - TPAC

Attachment C

DKS Associates
TRANSPORTATION SOLUTIONS

DRAFT MEMORANDUM

DATE: December 30, 2008

TO: TransPort

FROM: Jim Peters, P.E., P.T.O.E.
Jennifer Bachman
Renee Hurtado, P.E.

SUBJECT: **Draft Regional TSMO Vision** P06097-013-002

This draft memorandum summarizes the regional vision, goals and objectives of the Regional Transportation System Management and Operations plan. The vision and goals were developed through input from the Technical Advisory Committee (TAC) and were refined by the Policy Work Group.

Vision Statement

During the October 8, 2008 TAC meeting the following list of key ideas was developed for incorporation into the vision statement:

- move people and goods
- system predictability, reliability and efficiency
- multi-modal
- reduce traffic crashes
- green/sustainable
- coordinated regional response
- comprehensive real-time/forecasted traveler information
- measure performance
- active management/monitoring of the transportation system
- support the economy (cost effectively)
- coordinated and cooperative regional transportation operations

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From that list, the following draft vision statement was developed:

> The Portland metropolitan region will collaboratively and proactively manage its multimodal transportation system to ensure safe, reliable, efficient, and equitable mobility for people and goods. The region will strive to be a nationally recognized leader for innovative management and operations of its system.

Goals and Objectives - Guiding Principles and Aims

Four goals and three guiding principles encompass the key ideas expressed by the TAC members.

Objective targets are based on a 2020 target date.

Goal 1: Provide reliable travel times for people and goods movement.

Objectives:

- Reduce vehicle delay to maintain a travel time index of 1.20 or less on freeways and major arterials. Travel time index is the ratio of travel time during peak hours versus travel time during free flow conditions.
- Maintain a planning index time (95^{th} Percentile travel time divided by the free flow travel time) of 1.6 or less on arterials and freeways.
- Maintain a buffer index of 15% or less.

Goal 2: Enhance transportation safety and security for all modes.

Objectives:

- Reduce the vehicle crash rate by XX%.
- Reduce construction, weather and incident related delay
- Reduce secondary crashes by 30%.
- Reduce pedestrian and bicycle crash rate by 30%.

Goal 3: Support an environmentally, economically, and socially sustainable and efficient transportation system for all communities.

Objectives:

- Increase transit ridership by 5% annually.
- Improve connections between modes (e.g. auto to transit, bike to transit).
- Reduce CO_2 vehicle emissions and fuel consumption by 10%.
- Increase person carrying capacity within mobility corridors by 20%.
- Reduce VMT per capita by 10%.
- Increase pedestrian and bicycle commuters by 5% annually.

Goal 4: Provide comprehensive multimodal traveler information to people and businesses.

Objectives:

- Provide traveler information within five minutes of any major network changes.
- Provide forecasted traffic condition information.
- Provide comprehensive pre-trip and en-route traveler information.
- Provide personalized traveler information.

Guiding Principle 1: Enhance regional partnerships that support collaborative investment and implementation of management and operations strategies that benefit the region.

Aims:

- Develop (or update) a concept of operations for appropriate TSMO projects.
- Maintain and update ITS Architecture.
- Continue TransPort activities and engaging participants from all agencies.
- Incorporate regional involvement in developing, operating and implementing the regional transportation system.

Guiding Principle 2: Monitor transportation system performance and evaluate system management strategies to aid equitable policy and sustainable investment decisions.

Aims:

- Include a reliable data collection component and a method to retrieve that data with all projects to measure the effectiveness of the project (performance measurement).
- Issue regular summaries of available data and performance measurement.
- Store system management and operations data in one central data warehouse.
- Implement projects that generate positive returns on investment.

Guiding Principle 3: Provide on-going maintenance and operations to support the transportation network.

Aims:

- Identify and implement a resource plan for projects.
- Share resources to optimize maintenance and operation responsibilities.

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TECHNICAL MEMORANDUM

Metro Regional Transportation System Management and Operations Refinement Plan

TSMO Strategy Toolbox

Date: December 10, 2008 Project #: 9221

To: Jim Peters, P.E., DKS & Associates, Inc.

From: Peter Koonce, P.E. and Shaun Quayle, P.E.

cc: Deena Platman, Metro

1.0 INTRODUCTION

The purpose of this memorandum is to describe the TSMO strategies used nationally and internationally. The description of the strategies is organized in a simple to read format with information on each strategy. This menu is an information resource that stakeholders can use to identify strategies for implementation. This menu presents options which support the TSMO vision, goals, and objectives. This menu of strategies will also be referred to as a TSMO "toolbox", because from it we will build the next phases of this project, such as needs assessment, financing, and action plan.

At the first technical advisory committee (TAC) meeting, the past, present, and future of TSMO and ITS was discussed. This exercise allowed the TAC members to appreciate how far TSMO and ITS have come in a relatively short period while at the same time, thinking about the future possibilities. For example, ITS within the region 10 years ago was a few CCTV cameras on a website and fixed time ramp meters. Today, ramp meters are based on traffic demand, the website has incident reports, real-time speed data, and weather reports. The region's TSMO and ITS infrastructure has grown significantly over the last 10 years, and more substantial growth is expected over the next 10 years as political and cultural awareness of the need to operate and maintain the existing system increases, potentially along with funding. This plan will provide the direction for this TSMO regional growth.

2.0 TSMO FRAMEWORK & STRATEGIES OVERVIEW

The TSMO toolbox or menu of strategies is an information resource allowing the reader to easily find TSMO strategies, definitions, and details such as benefits, estimated costs, and political, institutional, and technical factors. These three factors influence the application and appropriateness of a treatment given a particular situation. This menu of strategies is meant to highlight the key state-of-the-practice TSMO strategies as a starting point for customizing a plan to suit the region. It should be noted there is overlap between many of the strategies, thus the framework could be set up to follow a number of configurations. The project team decided to follow a framework established by FHWA in their report, *Traffic Congestion and Reliability: Linking Solutions to Problems,* which grouped strategies by user and facility. These are arterial/freeway for pedestrians, bicycles, and automobiles; transit, and freight. The menu of strategies for this report follows this grouping.

Table 1 is a quick summary of the TSMO strategies outlined in this menu, which will help point the reader to strategies he or she is most interested in for greater detail in the next section of the memorandum. These strategies are hyperlinked to the appropriate page in the document. Abbreviations are used to represent the type of application in this summary table.

- A: arterial strategy,
- F: freeway strategy,
- AF: arterial/freeway strategy,
- FR: freight strategy, and
- T: transit strategy.

The estimated cost range in Table 1 generally refers to the following:

Low = less than $200,000

Medium = greater than $200,000, but less than $1 million

High = greater than $1 million

It should be noted that these cost ranges are largely dependent on the size, complexity, and extent of the project. For example, HOV lanes are relatively inexpensive to develop if they use existing pavement and right-of-way, but are very expensive if they involve building new infrastructure. Another good example is transit signal priority, which was applied by the City of Portland several years ago. Transit signal priority is a relatively low cost application if applied at 5-10 intersections, but the nearly citywide application of 250 intersections involved significant infrastructure investments such as modifying the standard traffic signal controller software and the bus Automatic Vehicle Location (AVL) system, resulting in a total project cost of $4.5 million. The range is appropriate because the costs listed in this toolbox are estimates.

Table 1 Summary of TSMO Strategies

Number	TSMO Strategy	Key Benefit(s)	Estimated Cost Range
A1	Access Management	Improved Mobility & Safety	Low (unless access rights or property to be purchased)
A2	Advanced Signal Systems	Reduced Congestion	Medium-High
A3	Changeable Lane Assignments	Reduced Congestion	Low
A4	Signal Retiming / Optimization	Improved Mobility	Low
A5	Red Light Cameras	Improved Safety	Medium
A6	Parking Management	Improved Mobility	Low
AF7	Active Traffic Management	Improved Mobility	Low-Medium
AF8	Event Management	Reduced Congestion	Low-Medium
AF9	Integrated Corridor Management	Improved Mobility	Medium
AF10	Real-Time Traveler Information	Improved Mobility	Low (if little added infrastructure), High (if added infrastructure)
AF11	Real-Time Traffic Data Collection using Private GPS Data	Improved Mobility	Low
AF12	Vehicle Infrastructure Integration	Improved Mobility & Safety	High
AF13	Automated Speed Enforcement	Improved Safety	Medium-High
AF14	Traffic Surveillance	Improved Mobility	Low
AF15	Emergency Management	Improved Safety	Varies depending on system complexity
F16	Incident Management	Improved Mobility & Safety	Low
F17	Work Zone Management	Improved Mobility & Safety	Low (if little added infrastructure), High (if added infrastructure)
F18	High Occupancy Vehicle/Toll Lanes	Improved Mobility	Low (if restriping/signing), High (if new construction)
F19	Reversible Lanes	Reduced Congestion	Medium-High
F20	Lane Controls / Temporary Shoulder Use	Reduced Congestion	Medium-High
F21	New Toll Roads / Congestion Pricing	Improved Mobility	High
F22	Electronic Toll Collection	Reduced Congestion	High
F23	Road Weather Information Systems	Improved Safety	Low-Medium
F24	Bottleneck Removal	Reduced Congestion	Medium-High
F25	Ramp Closures	Improved Mobility & Safety	Low
F26	Ramp Metering	Reduced Congestion	Low-Medium
F27	HOV Ramp Bypass	Improved Mobility	Low (if restriping/signing), High (if new construction)
F28	Transportation Management Center	Improved Mobility & Safety	High
F29	Variable Speed Limits	Reduced Congestion & Safety	Low-Medium

FR30	Real-Time Freight Information	Improved Mobility	Low
FR 31	Roadside Electronic Screening / Clearance Programs	Improved Mobility & Safety	Medium-High
FR32	Truck Only Lanes	Improved Mobility & Safety	Low (if restriping/signing), High (if new construction)
FR 33	Truck Signal Priority	Improved Mobility	Low
FR 34	Vehicle Tracking (Automatic Vehicle Location (AVL))	Improved Mobility	Low
T35	Park and Ride Lots	Reduced Congestion	Medium-High
T36	Real-Time Transit Information	Improved Mobility	Medium-High
T37	Transit Signal Priority	Improved Mobility	Low
T38	Transit Only Lanes / Transit Queue Jump	Improved Mobility	Low (if restriping/signing), High (if new construction)
T39	Vehicle Tracking (Automatic Vehicle Location (AVL))	Improved Mobility	Low

3.0 TSMO MENU OF STRATEGIES (TOOLBOX)

3.1 Arterial/Freeway Strategies

This section describes the menu of strategies for TSMO involving surface roadways (arterials) and freeways. It should be noted where strategies typically overlap, the designation AF, for arterial/freeways is used.

3.1.1 – Access Management (A1)

Description: Access Management is the process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed.

Example Strategy Applications:

- Shared or consolidating access points
- Restricting access point movements (medians, channelized movements)
- Closing access points

Potential Benefits:

- Reduction in crashes and crash rates
- Increased capacity, vehicle flows and speeds
- Less conflict points for pedestrians and bicyclists
- Medium impact on improving travel time reliability

Estimated Costs:

- Costs vary significantly depending on value of access rights and property values.

Influencing Factors:

Political Factors	• Access rights acquisition • Land use regulation • Different stakeholder interests should be considered
Institutional Factors	• Cooperation among and involvement of relevant government agencies, business owners, land developers and the public is necessary.
Technical Factors	• Access management can be adopted easily in the pre-development stage, but extremely difficult in the post-development stage.

3.1.2 – Advanced Signal Systems (A2)

Description: Advanced signal systems include coordinated signal operations across neighboring jurisdictions, as well as centralized control of traffic signals which may include the necessary infrastructure for development of innovative control strategies such as transit signal priority, truck priority or adaptive signal control.

Example Strategy Applications:

- Adaptive or Active Signal Control
- Traffic Responsive Control
- Transit Signal Priority
- Truck Signal Priority
- Real-time Signal Performance Measures
- Improved Signal Communication (Signal interconnect or link to central location)

Potential Benefits:

- Reduced delay, travel time and stops
- Increased average vehicle speed
- Reduced vehicle emissions
- High impact on improving travel time reliability

Estimated Costs:

- $20 - $25 per foot for copper wire signal interconnect; $5000 per intersection for wireless interconnect (availability depends on agencies and signal locations);
- $50,000 to $150,000 per intersection to install adaptive signal control (license, detection infrastructure and training).
- $1 - 2 million for adaptive signal system integration and firmware upgrade

Influencing Factors:

Political Factors	• New system needs to have significant advantage over the existing one to make the expenses reasonable
Institutional Factors	• Signal control across jurisdictions has to be coordinated, clear understanding of technology is necessary; • System compatibility across jurisdictions may not be an issue in Oregon as they use the same signal system platform
Technical Factors	• Keep up with changing signal technology • Consider risk/reward for "untested" technology • Benefit to implementing system features that are interoperable across manufacturer • Budget for training of new technology, and continued maintenance and support over life of technology.

3.1.3 – Changeable (or Dynamic) Lane Assignment (A3)

Description: The use of Changeable Lane Assignments Signs (CLAS) on frontage or streets adjacent to freeways can mitigate the lane imbalances seen on a time-of-day recurring basis and during freeway incidents. As traffic signals have long been used as a time management technique for optimizing traffic operations, CLAS is used as a space management technique to add an additional dimension to optimization.

Example Strategy Applications:

- Changeable lane assignment displays
  - Event or evacuation or incident management
  - Optimize existing pavement in response to recurring changing travel patterns

Potential Benefits:

- Reduced delay by 1% to 26% and increased throughput by 50 to 1,000 vehicles per hour during incidents or other conditions
- Medium impact on improving travel time reliability

Estimated Costs:

- Relatively low cost, but no specific numbers available.

Influencing Factors:

Institutional Factors	• Requires interagency cooperation when part of a larger management strategy, such as incident management or integrated corridor management.
Technical Factors	• Driver awareness and adjustment to their use. Require adequate approach and receiving lanes to facilitate their use.

3.1.4 – Signal Retiming/Optimization (A4)

Description: Signal retiming / optimization includes updating signal timing plans for prevailing traffic conditions, interconnecting signals, and potentially upgrading signal technology to meet timing objectives.

Example Strategy Applications:

- Developing and implementing revised or new signal timing plans
- Installing or upgrading signal communication infrastructure (locally with interconnect, regionally with fiber or wireless connection to a central location)
- Installing or upgrading signal technology (i.e. cabinet, controller, detection)

Potential Benefits:

- Reduced travel time by 10% to 25%
- Decreased fuel consumption
- High benefit-to-cost ratio which can range from 17:1 to 40:1
- High impact on improving travel time reliability

Estimated Costs:

- $3,000 - $5,000 per intersection for signal retiming
- $1,000 - $4,000 for controller + software replacement/upgrades (if necessary)

Influencing Factors:

Political Factors	• Prioritizing operational efficiency benefit over other projects
Institutional Factors	• Key to have coordination and compatibility across agencies for new timing plans or signal system infrastructure.
Technical Factors	• Understanding new technology, capabilities and limitations • Realize signal retiming and optimization should be revisited as needed, but every 3-5 years is recommended

3.1.5 – Red Light Running Cameras / Automated Enforcement (A5)

Description: Automated enforcement technologies can assist with the enforcement of traffic signal compliance. Still or video cameras, activated by detectors, can record vehicles traveling through a red signal.

Example Strategy Applications:

- Red Light Cameras (either video or still frame)
  - Agency owned (high initial capital cost and regular maintenance, but keep all or portion of profits).
  - Agency leased (lower capital cost, vendor maintains system, but keeps all or a portion of profits).

Potential Benefits:

- Decreased severity and number of turning/angle crashes (increased number of rear-end crashes)
- 60-80% of drivers approve of their use based on survey data
  20-75% reduction in red light violations

Estimated Costs:

- $65,000 to $80,000 per intersection

Influencing Factors:

Political Factors	• Public perception of automated enforcement
Institutional Factors	• Agencies should ensure clear laws or codes are in place to support automated enforcement (i.e. will citation go to registered vehicle owner or driver of vehicle at the time). • Coordination with legal departments/lawyers maybe necessary upon start up due to law suits • Who operates and maintains the system? Where do profits go?
Technical Factors	• Places greater scrutiny on signal timing and clearance interval timings.

3.1.6 – On-Street Parking Management (A6)

Description: The management of on-street parking locations, durations, and vehicle types to allow more efficient use of existing roadway capacity and reduce potential conflicts which reduce traffic flow rates.

Example Strategy Applications:

- Temporary or full-time on-street parking restrictions
- Restrictions on delivery vehicle parking or double-parking (more typical in downtowns)
- Increased enforcement of parking restrictions

Potential Benefits:

- Increased saturation/traffic flow
- Efficient use of roadway capacity without adding new pavement

Estimated Costs:

- Minimal signing and striping costs.
- Increased enforcement can be costly if new staff is required.

Influencing Factors:

Political Factors	• Prioritizing the importance of moving vehicles over business access
Institutional Factors	• Easier to plan to manage parking on a new facility, than to remove or restrict on-street parking on an existing facility • Coordinate management strategy across jurisdictional boundaries when necessary
Technical Factors	• Interaction with bicycle lanes

3.1.7 – Active Traffic Management (AF7)

Description: Active traffic management consists of a combination of operational strategies that, when implemented in concert, fully optimize the existing infrastructure and provide measurable benefits to the transportation network and the motoring public. These strategies include but are not limited to speed harmonization, temporary shoulder use, junction control, dynamic signing and rerouting and managed lanes.

Example Strategy Applications:

- Variable speed limits (speed harmonization)
- Managed lanes (dynamic lane assignment, reversible lanes, temporary shoulder use)
- Changeable lane assignment
- Real-time traveler information (i.e. dynamic message signs, mobile traffic data)
- Advanced signal systems (i.e. optimized or adaptive signal timing)

Potential Benefits:

- Increase in average throughput in congested periods by 3% to 7%
- Decrease in accident rate by 3 to 50%

Estimated Costs:

- Varies depending on application, but system development is typically high because it involves multiple TSMO strategies in concert.

Influencing Factors:

Political Factors	• Prioritizing operational efficiency benefit with existing system over expanded system capacity projects
Institutional Factors	• Key to have coordination and compatibility across agencies to maximize effectiveness
Technical Factors	• Understanding new technology, capabilities and limitations • Budget for training if new technology, and continued maintenance and support over life of technology. • Consider risk/reward for "untested" technology

3.1.8 – Event Management (AF8)

Description: Event transportation management systems can help control the impact of congestion at stadiums or convention centers. In areas with frequent events, large changeable destination signs or other lane control equipment can be installed. In areas with occasional or one-time events, portable equipment can help smooth traffic flow.

Example Strategy Applications:

- Reversible lanes, temporary shoulder use
- Changeable lane assignment
- Advanced signal systems (i.e. optimized or adaptive signal timing)
- Additional temporary signage and traffic control

Potential Benefits:

- Reduced delay amidst heavy demand during special events
- Reduced crash rates due to reduced conflicts
- Increased attractiveness of event attendance, particularly repeat attendees
- Medium impact on improving travel time reliability

Estimated Costs:

- $2,000 - $3,000 per intersection for specialized event timing plan;
- $20-$50 per hour per officer for manual traffic control
- $2,000 - $3,000 per reversible lane control display; $300K - $450K per lane control system including software, integration and other hardware costs

Influencing Factors:

Political Factors	• Frequent roadway detours and lane control measures may bring confusion and inconvenience to drivers and nearby residents
Institutional Factors	• Coordination with various event organizers and agencies is necessary
Technical Factors	• Events of various magnitude in different locations require different measures and scope of coordination

3.1.9 – Integrated Corridor Management (AF9)

Description: Integrated corridor management recognizes that a transportation system operation is most effective when viewed from the overall system perspective. With integrated corridor management, the various institutional partner agencies manage the transportation corridor as a system, rather than the more traditional approach of managing individual assets. Travelers could receive information that encompasses the entire transportation network. They could dynamically shift to alternative transportation options, even during a trip, in response to changing traffic conditions.

Example Strategy Applications:

- Real-time traveler information (i.e. dynamic message signs, mobile traffic data)
- Advanced signal systems (i.e. optimized or adaptive signal timing)
- Changeable lane assignment

Potential Benefits:

- Reduced travel time and delays
- Increased reliability and predictability of travel

Estimated Costs:

- $50,000 - $100,000 per variable message signs depending on size; $1 - 3 million to design and implement;
- $100,000 - 2 million for annual O&M which varies among the scope of the system
- $2,000 - $3,000 per intersection for specialized signal timing plan

Influencing Factors:

Political Factors	• Prioritizing management of the system over capacity expansion projects
Institutional Factors	• Interagency cooperation and implementation is key to project success
Technical Factors	• Understanding new technology, capabilities and limitations • Budget for training if new technology, and continued maintenance and support over life of technology.

3.1.10 – Real-Time Traveler Information (AF10)

Description: Traveler Information activities include the collection and dissemination of information to the traveling public. This information includes traffic and road conditions, general public transportataion and parking information, incident information, roadway maintenance and construction information, and weather information. Motorists are now able to receive relevant information on location-specific traffic conditions in a number of ways, including dynamic message signs (DMS), highway advisory radio (HAR), and in-vehicle signing, or specialized information transmitted to individual vehicles.

Example Strategy Applications:

- Dynamic message signs
- Highway advisory Radio
- GPS-based in-vehicle traffic data
- Traffic surveillance cameras

Potential Benefits:

- Reduced delay by 1% to 22% and number of stops by 5% to 6%
- Reduced gas emissions by 3% to 5%
- Decreased crash fatalities by 3%
- High potential to improve travel time reliability

Estimated Costs:

- $50,000 - $100,000 per variable message signs depending on size
- $1 - 3 million to design and implement
- $100,000 - 2 million for annual O&M which varies among the scope of the information system
- $300 per GPS unit; $150 per year for operation (DASH)

Influencing Factors:

Political Factors	• Prioritizing information systems over expanded capacity projects. • High project visibility potential among the public
Institutional Factors	• Agency partnership and data/resource sharing to create a robust system
Technical Factors	• Rapidly changing field, user understanding is key

3.1.11 – Real-Time Traffic Data Collection Using Private GPS Data (AF11)

Description: Automobiles are used to monitor the surrounding environment with an onboard computer. Data are sent to a Web server through pre-existing Wi-Fi networks, which help drivers track conditions specific to their cars and provides historical and real-time traffic conditions at different times of the day using combined data from all service subscriber participants.

Example Strategy Applications:

- DASH navigation system
- Indiana DOT/Purdue University pilot project using cell phone data to track vehicles

Potential Benefits:

- Reduce travel time and delay by alerting and informing drivers of congested areas
- Reduce potential crashes due to congestion
- High potential to improve travel time reliability

Estimated Costs:

- $300 per GPS unit; $150 per year for operation (DASH/MIT product)
- Access to the data has not been discussed with potential vendors

Influencing Factors:

Institutional Factors	• Is the GPS vehicle data shared with the agency and at what cost?
Technical Factors	• Understanding new technology, capabilities and limitations • Integration with other ITS components

3.1.12 – Vehicle Infrastructure Initiative (AF12)

Description: Vehicle Infrastructure Initiative (VII) is a research program focused on enabling wireless communications among motor vehicles and between motor vehicles and roadside infrastructures. This involves various public and private sector entities. By enabling secure real-time communications with motor vehicles, new services will be enabled to enhance transportation safety, mobility, and commerce. It is likely that VII strategies are several years from implementation, unless a significant effort by the region is made to attract a demonstration program from FHWA or through OTREC.

Example Strategy Applications:

- In-vehicle communication and interaction with roadway/signal infrastructure

Potential Benefits:

- Decrease traffic accidents and fatalities
- Reduced delays
- Increased effective roadway capacity

Estimated Costs:

- Costs remain estimates because this initiative is in its infancy.

Influencing Factors:

Institutional Factors	• Coordination between agencies is critical to provide uniform driver information
Technical Factors	• VII is under development and considerable amount of time is needed before large scale deployment is possible and communication infrastructure is mature

3.1.13 – Automated Speed Enforcement (AF13)

Description: Automated speed detection (typically in work zones) can enable automated ticketing of vehicles exceeding posted speed limits when combined with automatically triggered vehicle identification technologies such as photographs, still or video digital imaging, or license plate recognition. Some systems transmit images of offending vehicles to police officers downstream of the work zone where enforcement can be carried out more safely.

Example Strategy Applications:

- Automated Speed Enforcement Cameras (either video or still frame)
    - Agency owned (high initial capital cost and regular maintenance, but keep all or portion of profits).
    - Agency leased (lower capital cost, vendor maintains system, but keeps all or a portion of profits).

Potential Benefits:

- Increased perception of safety
- Reduced travel speeds

Estimated Costs:

- $85,000 per vehicle mounted camera
- $20,000 per fixed location installation (speed trailers)

Influencing Factors:

Political Factors	• Public perception of automated enforcement
Institutional Factors	• Who does the operations and maintenance? How are costs and profits distributed?

3.1.14 – Traffic Surveillance (AF14)

Description: Many of the services possible through arterial and freeway management systems are enabled by traffic surveillance and detection technologies, such as sensors or cameras, monitoring traffic flow. Traffic surveillance is a key building block to many of the strategies identified in the toolbox

Example Strategy Applications:

- Vehicle detection/counters (i.e. inductive loops, microwave, video)
- Closed circuit video (CCTV)

Potential Benefits:

- Improved incident response times and accuracy of information disseminated to emergency responders
- Real-time and historic system operations information
- Improved visual information for decision-makers and the public

Estimated Costs:

- $15,000 - $30,000 per CCTV detection unit, $400 to $2,000 per loop detector, additional costs for cabinet and related hardware
- Wireless communications to cameras has reduced costs significantly
- Costs for for central system integration and continued improvements to incorporate new cameras

Influencing Factors:

Political Factors	• Public perception of "big brother" surveillance and invasion of privacy
Institutional Factors	• Sharing communication infrastructure and broadcasts across agencies
Technical Factors	• Integrating with other TSMO or ITS components

3.1.15 – Emergency Management (AF15)

Description: ITS applications in emergency management include hazardous materials management, the deployment of emergency medical services, and large and small-scale emergency response and evacuation operations.

Example Strategy Applications:

- On road incident responders
- Emergency vehicle traffic signal preemption or priority
- Evacuation strategies (i.e. reversible or shoulder lanes, specialized signal timing plans)

Potential Benefits:

- Reduced incident response time
- Improved HAZMAT and counterterrorism technology
- Improved travel time and less congestion under evacuation scenarios

Estimated Costs:

- Cost varies depending on the scale and scope of the emergency management system;
- Cost of an emergency operation center may range from $150K to $5 million;
- Hazmat transportation operation technology may range from $250 to $3,500 per vehicle.
- GPS AVL on emergency vehicles costs $4,000 per intersection and $2,000 per vehicle.

Influencing Factors:

Political Factors	• Viewed as proactive protection of public safety
Institutional Factors	• Coordination between agencies is critical to success
Technical Factors	• Integration of multiple ITS components may aid in project effectiveness

3.1.16 – Incident Management (F16)

Description: Incident management systems can reduce the effects of incident-related congestion by decreasing the time to detect incidents, the time for responding vehicles to arrive, and the time required for traffic to return to normal conditions. Incident management systems make use of a variety of surveillance technologies as well as enhanced communications and other technologies that facilitate coordinated response to incidents.

Example Strategy Applications:

- Traffic surveillance (i.e. CCTV, vehicle detection)
- On road incident responders
- Real-time traveler information systems (i.e. highway advisory radio, dynamic message signs)
- Regional coordination with other traffic management and emergency management centers

Potential Benefits:

- Reduced average incident duration by 28% to 70%
- Decreased secondary crashes by up to 28% to 70%
- Reduced delay due to quicker incident response
- Medium potential to improve travel time reliability

Estimated Costs:

- $15,000 - $30,000 per CCTV detection unit, $400 per loop detector
- $55 per vehicle hour for patrolling vehicle
- $8,000 - $13,000 per unit of mobile incident investigation equipment

Influencing Factors:

Political Factors	• Prioritizing incident response/system management over system expansion
Institutional Factors	• Various agencies and first responders need to be coordinated, inter-agency communication is the key • Systems may provide flexibility for future installation and coordination by neighboring jurisdictions
Technical Factors	• A sound communication system with wide coverage is crucial; interoperability issue among different agencies

3.1.17 – Work Zone Management (F17)

Description: ITS applications in work zones include the temporary implementation of traffic management or incident management capabilities. These temporary systems can be stand-alone implementations or they may supplement existing systems in the area during construction. Other applications for managing work zones include measures to control vehicle speeds and notify travelers of changes in lane configurations or travel times and delays through the work zones. ITS may also be used to manage traffic along detour routes during full road closures to facilitate rapid and safe reconstruction projects.

Example Strategy Applications:

- Variable speed limits / automated speed enforcement
- Real-time traveler information

Potential Benefits:

- Reduced traveling speed across work zone by 9 mph
- Improved safety with reduced travel speed
- Reduced delay by 46% to 55% and travel time
- High potential to improve travel time reliability

Estimated Costs:

- $150 - 800k for a work zone management system, which commonly includes variable message signs ($50k-120k capital, $2.5k-6k operations and maintenance),
- CCTV-surveillance ($7k-19k capital, $1.0k-2.5k operations and maintenance), Highway Advisory Radio ($16-32k capital, $500-1,000 operations and maintenance), traffic detectors ($3-13k capital, $100-1,000 operations and maintenance) and variable speed limit display ($3-5k capital), etc.
- Costs are dependant on agency leasing or purchasing, and portable versus permanent components.

Influencing Factors:

Political Factors	• Prioritizing safety over system capacity expansion projects
Technical Factors	• Coordination with other ITS components is key

3.1.18 – HOV/HOT Managed Lanes (F18)

Description: HOV lanes carry vehicles with a higher number of occupants, which serve to increase the total number of people moved through a congested corridor. In general, carpoolers, vanpoolers, and bus patrons are the primary beneficiaries of HOV lanes by allowing them to move through congestion. HOT lanes allow single occupancy vehicles to use the HOV lanes for a toll.

Example Strategy Applications:

- HOV lanes
- HOT lanes

Potential Benefits:

- Improved people throughput by allowing a higher flow for HOV
- Incentive for carpooling/vanpooling/transit
- Can remove vehicles from roadway, reducing emissions
- Medium/High potential to improve travel time reliability

Estimated Costs:

- $100,000 to $3 million per mile capital costs, depending on need to reconstruct lanes or not.
- Low operations and maintenance costs, generally on HOV lanes. Tolled HOT lanes are more costly to build, operate and maintain due to tolling infrastructure and staff.

Influencing Factors:

Political Factors	• High public perception, involves public policy decision for prioritizing people movement over individual vehicle movement.
Institutional Factors	• If congestion spans agencies, they should work together to implement consistent TSMO strategies to realize full benefits.
Technical Factors	• May increase congestion for general purpose lane

3.1.19 – Reversible Lanes (F19)

Description: Traffic sensors and lane control signs can be used to implement reversible flow lanes allowing travel in the peak direction during rush hours or for special events/emergencies.

Example Strategy Applications:

- Temporary or permanent signage for reversible lanes

Potential Benefits:

- Reduced crash rates due to decreased congestion
- Improve travel time and delay in peak directions
- More efficient use of existing roadway pavement/capacity

Estimated Costs:

- $2,000 - $3,000 per lane control display;
- $300K - $450K per lane control system including software, integration and other hardware costs

Influencing Factors:

Political Factors	• May create confusion for infrequent drivers
Institutional Factors	• Education for the public on what they are expected to do during contra-flow situations is necessary
Technical Factors	• New technology in US

3.1.20 – Lane Controls/Temporary Shoulder Use (F20)

Description: Lane control signs, supported by surveillance and detection technologies, allow the temporary closure of lanes to avoid incidents on freeways, or use of shoulders as a travel lane to increase capacity.

Example Strategy Applications:

- Temporary shoulder use
- Temporary lane closure for work zone or incident
- Reversible lanes

Potential Benefits:

- Reduced crash rates
- Improve travel time and delay in peak directions
- More efficient use of existing roadway pavement/capacity

Estimated Costs:

- $2,000 - $3,000 per lane control display;
- $300K - $450K per lane control system including software, integration and other hardware costs

Influencing Factors:

Political Factors	• May create confusion for infrequent drivers
Institutional Factors	• Education for the public on what they are expected to do during contra-flow situations is necessary
Technical Factors	• New technology in US

3.1.21 – New Toll Roads/Congestion Pricing (F21)

Description: Congestion pricing is a way of harnessing the power of the market to reduce the waste associated with traffic congestion. Congestion pricing works by shifting purely discretionary rush hour highway travel to other transportation modes or to off-peak periods, taking advantage of the fact that the majority of rush hour drivers on a typical urban highway are not commuters.

Example Strategy Applications:

- Constructing or converting a roadway or a portion of roadway to tolling
- Cordon pricing for entry to a certain district (i.e. London, England)

Potential Benefits:

- Provided high level of service to users, with 20% decrease in traffic for the London case
- Divert traffic to another mode or to travel at different times of the day
- Medium potential to improve travel time reliability

Estimated Costs:

- $250,000 per mile for conversion of HOV to HOT lanes
- $2 - 4 million per lane per mile for new construction of HOT lanes

Influencing Factors:

Political Factors	• Can be publicly controversial, tough to establish toll facilities if the concept is new to a region or not widely practiced
Technical Factors	• Effects of different tolling methods vary, benefits versus costs need to be carefully considered

3.1.22 – Electronic Toll Collection (F22)

Description: Electronic toll collection (ETC) supports the collection of payment at toll plazas using automated systems to increase the operational efficiency and convenience of toll collection. Systems typically consist of vehicle-mounted transponders identified by readers located in dedicated and/or mixed-use lanes at toll plazas

Example Strategy Applications:

- Electronic toll collection with vehicle mounted transponders

Potential Benefits:

- Reduced traffic volume by up to 17%
- Reduced delay by 50% to 85%
- Reduced vehicle emissions by 16% to 63%
- Cost saving for electronic toll lane over staffed lane (ETC only requires one maintenance person and account support)
- High potential for improved travel time reliability

Estimated Costs:

- ~$1 million hardware cost for a 7-lane toll plaza; $16,000 per year to operate an electronic toll collection lane;
- $0.05-0.10 cost per ETC transaction; $15-$50 cost for each transponder

Influencing Factors:

Political Factors	• Privacy concern on vehicle and personal information with the use of tolling technologies
Institutional Factors	• Interoperability issues at the transponder level with neighboring toll facilities
Technical Factors	• Plan for changes in tolling technologies so that interoperability can be attained easily in the future

3.1.23 – Road Weather Information Systems (F23)

Description: Road weather management includes the surveillance, monitoring, and prediction of weather and roadway conditions. It enables the appropriate management actions to mitigate the impacts of any adverse conditions especially during winter and snowy conditions.

Example Strategy Applications:

- Closed circuit cameras
- Ramp closures
- Real-time traveler information (i.e. dynamic message signs, highway advisory radio)
- Variable speed limits

Potential Benefits:

- Improved safety by reducing 3 to 17% of crashes
- Reduced vehicle speed by 2 to 5 mph during adverse weather
- Improved information for agency decision-makers and travelers
- High potential to improve travel time reliability

Estimated Costs:

- Cost varies which can range from $20,000 for a sensor unit to over $3 million for a weather management system.
- Weather station ($20-50k capital, $1.5-4k operations and maintenance)
- CCTV-surveillance ($7k-19k capital, $1k-2.5k operations and maintenance)
- Highway Advisory Radio ($16-32k capital, $500-1,000 operations and maintenance)
- Variable message signs ($50k-120k capital, $2.5k-6k operations and maintenance)
- Variable speed limit display ($3-5k capital).

Influencing Factors:

Political Factors	• Prioritizing safety over expanded system capacity
Institutional Factors	• Interagency cooperation provides greatest benefit to traveling public
Technical Factors	• Integration of various ITS components

3.1.24 – Bottleneck Removal (F24)

Description: Bottleneck removal in freeway can be achieved by various geometric or operational strategies after identifying the bottleneck locations and detecting the causes.

Example Strategy Applications:

- New general purpose or auxiliary lanes
- Temporary shoulder use
- Interchange geometry reconfiguration

Potential Benefits:

- Decreased injury crash rate by 35% on average
- Reduced delay
- High potential to improve travel time reliability

Estimated Costs:

- Cost varies, can range from a few thousand dollars to tens of millions

Influencing Factors:

Technical Factors	• Sufficient and accurate data collection is important for bottleneck analysis and the subsequent mitigation

3.1.25 – Ramp Closures (F25)

Description: Surveillance and control technologies can allow for the temporary closure of freeway ramps to accommodate peak traffic conditions or inclement weather conditions.

Example Strategy Applications:

- Closing a ramp due to weather, and recurring/non-recurring congestion

Potential Benefits:

- Reduced crash rates
- Increased mobility on mainline
- Medium potential to improve travel time reliability

Estimated Costs:

- Generally low for infrastructure

Influencing Factors:

Political Factors	• Limits access to roadways, can be met with significant resistance.
Institutional Factors	• Congestion may worsen on remaining interchanges as additional demand burdens the surface street system
Technical Factors	• Should be integrated with other ITS components (traffic management center, weather management system, etc)

3.1.26 – Ramp Metering (F26)

Description: Traffic signals on freeway ramp meters alternate between red and green signals to control the flow of vehicles entering the freeway. Metering rates can be altered based on freeway traffic conditions. ODOT has a successful implementation of ramp metering throughout the Portland-metropolitan area. Expansion farther from the City is a potential.

Example Strategy Applications:

- Signalized ramp metering

Potential Benefits:

- Reduced mainline peak period delay
- Increased freeway speed by 8% to 26%
- Improved freeway capacity by 10%
- Reduced duration of congestion
- Reduced vehicle conflicts by 24% to 50%
- High potential to improve travel time reliability

Estimated Costs:

- $25,000 - $66,000 per site
- $6,500 for detection components per site
- $1,000-$3,000 per site for annual operation and maintenance

Influencing Factors:

Political Factors	• Public perception and potential resistance
Institutional Factors	• Agency coordination on operations to ensure impact of ramp queues is tolerable.
Technical Factors	• Maintenance of infrastructure and timing plans to address changing traffic patterns and needs of the various communities.

3.1.27 – HOV Ramp Bypass (F27)

Description: Priority access to highway is given to HOVs. Access options include allowing HOVs to bypass ramp meters, providing a dedicated flyover ramp for HOVs, etc. ODOT operates a few of these facilities throughout the Metro area.

Example Strategy Applications:

- HOVs have their own exclusive lane or ramp for quicker or unimpeded freeway access

Potential Benefits:

- Reduced passenger travel time by 2% to 15%
- Incentive for carpooling/vanpooling/transit
- Can remove vehicles from roadway, reducing emissions by 2% to 13%
- Medium potential to improve travel time reliability

Estimated Costs:

- $100,000 to $3 million per mile capital costs, depending on need to reconstruct lanes or not.
- Low operations and maintenance costs, generally.

Influencing Factors:

Political Factors	• High public perception, involves public policy decision for prioritizing people movement over individual vehicle movement.
Institutional Factors	• Agencies should work together to develop a ramp metering system and timing plan to avoid queue spillback to upstream intersections.

3.1.28 – Transportation Management Center (F28)

Description: The purpose of a Transportation Management Center is to integrate various departments and offices of transportation and emergency agencies into a unified communications center. The integration provides the communications and computer infrastructure necessary for coordinated transportation management on roadways during normal commuting periods, as well as during special events and major incidents. ODOT operates the Region 1 TMC successfully to manage incidents and provide traveler information.

Example Strategy Applications:

- Central management location to monitor, change, and measure the transportation system

Potential Benefits:

- More efficient coordination and operation of various transportation systems
- Better data collection for decision-making and future planning purposes
- Co-locate and collaborate with traffic, transit, fire, emergency, police, etc.

Estimated Costs:

- $1.8 million - 10 million for TMC capital cost
- $400K - $2 million for annual O&M

Influencing Factors:

Political Factors	• Expenses may be shared depending on the scope of the TMC
Institutional Factors	• Communication and interoperability issues may exist among agencies. Changing agency culture to operate differently. • Further collaboration with transportation, emergency, police, fire, etc.
Technical Factors	• TMCs are a unique management challenge for local agencies. • Center-to-Center communication requires significant investment and coordination (CTIC involvement)

3.1.29 – Variable Speed Limits (F29)

Description: Variable speed limit systems use sensors to monitor prevailing traffic and/or weather conditions, posting appropriate enforceable speed limits on dynamic message signs. Also known as "speed harmonization."

Example Strategy Applications:

- Variable speed limit systems

Potential Benefits:

- Decreased mean travel speeds by up to 3 mph
- Reduced crash rates
- Reduction of congestion
- High potential to improve travel time reliability

Estimated Costs:

- $3,000 - $5,000 per variable speed display sign
- Implementation costs associated with upgrades of infrastructure, monitoring systems

Influencing Factors:

Political Factors	• Potential need to increase law enforcement of variable speeds • Application would require review by Oregon legislature
Institutional Factors	• Cooperative or identical systems should be used across jurisdictional boundaries
Technical Factors	• Integration into detection/surveillance and communication systems

3.2 Freight Strategies

This section describes the menu of strategies for TSMO involving freight and intermodal modes.

3.2.1 – Real-Time Freight Information (FR30)

Description: Real-time information on cargo status can be provided to ocean carriers, exporters, importers, foreign freight forwarders, customs brokers, terminal operators, and rail and trucking services. It enables port users to post and receive information on the location and status of freight shipments.

Example Strategy Applications:

- Vehicle tracking (AVL) systems
- In-vehicle traffic and roadway data
- Real-time traveler information (i.e. highway advisory radio, dynamic message signs)

Potential Benefits:

- Ability to track the freight location and estimate the traffic condition for real-time freight route planning
- Increased freight movement efficiency

Estimated Costs:

- Ranges from $500 to $2,500 per in-vehicle tracking equipment depending on the functionality

Influencing Factors:

Political Factors	• Prioritizing freight movement over people
Technical Factors	• Integration with other ITS components (i.e signal system for truck priority)

3.2.2 – Roadside Electronic Screening/Clearance Programs (FR31)

Description: Electronic screening applications promote safety and efficiency for commercial vehicle operators. Carriers that equip their fleets with low-cost in-vehicle transponders can communicate with check stations and automatically transfer regulatory data to authorities as trucks approach check stations. These and other technologies such as weight-in-motion (WIM) scales improve efficiency and reduce congestion at check stations by allowing safe and legal carriers to bypass inspections and return to the mainline without stopping.

Example Strategy Applications:

- Weight-in-motion scales
- GPS and AVL systems
- Clean power source at truck stops

Potential Benefits:

- Reduced inspection time by 14% to 66%
- Reduced freight travel time and delay
- Reduced vehicle emissions

Estimated Costs:

- $150k to $780k per electronic screening weigh station

Influencing Factors:

Political Factors	• Prioritizing freight movement over people
Technical Factors	• Integration with other ITS components (i.e freight AVL)

3.2.3 – Truck Only Lanes (FR32)

Description: Truck-only lanes are lanes designated for the use of trucks. The purpose of truck-only lanes is to separate trucks from other mixed-flow traffic to enhance safety and/or stabilize traffic flow.

Example Strategy Applications:

- Construct or convert truck-only lanes (full-time or part-time)

Potential Benefits:

- Increased highway safety
- More stable traffic flow
- Medium potential to improve travel time reliability

Estimated Costs:

- $100,000 to $3 million per mile capital costs, depending on need to reconstruct lanes or not.
- Low operations and maintenance costs, generally.

Influencing Factors:

Political Factors	• Prioritizing freight movement over people
Technical Factors	• Truck only lanes are not common in the US

3.2.4 – Truck Signal Priority (FR33)

Description: Truck signal priority is used to improve the operation of heavy trucks passing through traffic signal controlled intersections on rural high-speed highways, by adding vehicle detectors that respond only to trucks. The City of Portland has implemented this at a few locations within the City.

Example Strategy Applications:

- Truck Signal Priority (Green extension only is typical)

Potential Benefits:

- Reduced number of truck stops, which is estimated to cost $3 per truck per stop

Estimated Costs:

- $30,000 per inductive loop truck detector; $5,000 per intersection for data collection and retiming effort

Influencing Factors:

Political Factors	• Prioritizing freight movement over people
Technical Factors	• Adjusts the traffic actuated signal systems which can decrease the presence of vehicles in the dilemma zone, potentially resulting in a safety issue • Green extension is the most beneficial priority type

3.2.5 – Freight Vehicle Tracking (AVL) (FR34)

Description: Automated vehicle location, together with computer aided dispatch systems, can assist carriers with scheduling and tracking of vehicle loads.

Example Strategy Applications:

- GPS, AVL system in vehicle
- Central dispatch or vehicle-vehicle communication

Potential Benefits:

- Increased fleet productivity by 5% to 25%
- Improved HAZMAT safety and security by reducing potential terrorist consequences by approximately 36%

Estimated Costs:

- Ranges from $500 to $2,500 per in-vehicle tracking equipment depending on the functionality

Influencing Factors:

Technical Factors	• Integration with other ITS components (i.e signal system for truck priority)

3.3 Transit Strategies

This section describes the menu of strategies for TSMO involving transit modes.

3.3.1 – Park and Ride Lots (T35)

Description: Park and ride facilities are public transport stations that allow commuters and other people wishing to travel into city centers to leave their personal vehicles in a car park and transfer to a bus, rail system or carpool for the rest of their trip.

Example Strategy Applications:

- Park and ride surface lot or garage.
- Off-street parking management (i.e. info system to relay number and location of available spaces)

Potential Benefits:

- Ease congestion and parking demand in city center
- Increase transit ridership

Estimated Costs:

- $5,000 per stall (surface lot)
- $15-25,000 per stall (above ground garage)
- $35-40,000 per stall (below ground garage)

Influencing Factors:

Political Factors	• Policy decisions for high downtown parking charges can lead to park and ride demand.
Institutional Factors	• Partnership with roadway and transit agencies is key. • Land availability along transit routes may require structure parking
Technical Factors	• Integrate into other ITS components (i.e. off-street parking management)

3.3.2 – Real-Time Transit Information (T36)

Description: Transit agencies can disseminate both schedule and system performance information to travelers through a variety of applications, in-vehicle, wayside, or in-terminal dynamic messages signs, as well as the internet or wireless devices. Coordination with regional or multimodal traveler information efforts can also increase the availability of this transit schedule and system performance information. TriMet has implemented this through its Transit Tracker system.

Example Strategy Applications:

- Dynamic message signs at transit stops
- On-line website integrated with real-time transit ITS (i.e. AVL/GPS)

Potential Benefits:

- Enhanced passenger convenience
- Increased attractiveness of transit

Estimated Costs:

- Information will be requested from TriMet if needed.

Influencing Factors:

Political Factors	• N/A
Institutional Factors	• Cooperation and integration between for dissemination of the information agencies (inclusion of Trimet information on Tripchek.org) may encourage travelers to consider transit as opposed to driving alone.
Technical Factors	• GPS location refreshing rate is critical for real-time transit information but limited by communication bandwidth; • Signs at transit stop are less worthwhile if everyone can use their cell phone or web enabled phone to check the transit arrival time

3.3.3 – Transit Signal Priority (T37)

Description: Transit signal priority (TSP) systems use sensors to detect approaching transit vehicles and alter signal timings to improve transit performance. TriMet has integrated Opticom emitters into the bus Automatic Vehicle Location system to request priority when an equipped meets the following criteria: bus is behind schedule, within the City of Portland, and the doors of the bus are closed. The City of Portland has the only application of bus priority in the region, applied on most of the major arterial corridors throughout the City. Light rail transit vehicles receive preemption and priority at intersections throughout its length in Portland, Beaverton, Hillsboro, and Gresham.

Example Strategy Applications:

- Green extension
- Red truncation (early green, may include phase skipping)
- Exclusive transit phase(s)
- Transit only lanes/queue jumps

Potential Benefits:

- Improved Overall Travel Time by 2% to 42%/Reduced Delay up to 48%
- Improved Travel Time Reliability/Less Variability
- Fleet reduction
- Reduced system operational costs (number of buses and fuel costs)

Estimated Costs:

- $5k to $35k per intersection
- $2k to $14k per bus

Influencing Factors:

Political Factors	• Willingness to prioritize transit over other modes at critical intersections
Institutional Factors	• Signal system capabilities across agencies
Technical Factors	• Infrastructure to support TSP (i.e. controllers) • Transit signal priority in place always, or by time of day, number of riders, and schedule adherence.

3.3.4 – Transit Only Lanes/Queue Jumps (T38)

Description: Transit-only lanes are lanes designated for the use of transit vehicles only. The purpose of transit-only lanes and transit queue jumps are to provide preferential treatments to give transit an advantage over other roadway modes.

Example Strategy Applications:

- Transit only lanes/queue jumps
- Transit signal priority
- Exclusive transit phase(s)

Potential Benefits:

- Reduced transit delay
- Improved transit travel times
- Increased transit ridership

Estimated Costs:

- $75,000 to $125,000 per approach for queue jump/bus bypass (not including right-of-way costs)
- $100,000 to $3 million per mile capital costs, depending on need to reconstruct lanes or not.
- Low operations and maintenance costs, generally.

Influencing Factors:

Political Factors	• Willingness to prioritize transit over other modes
Institutional Factors	• Signal system capabilities across agencies
Technical Factors	• Infrastructure to support transit preferential treatments (controllers, interconnect, etc) • Transit preferential treatments in place always, or by time of day, number of riders, and schedule adherence.

3.3.5 – Transit Vehicle Tracking (AVL) (T39)

Description: Automatic vehicle location (AVL), together with computer aided dispatch (CAD) systems, facilitates the management of transit operations, providing up-to-date information on vehicle locations to assist transit dispatchers as well as inform travelers of bus status.

Example Strategy Applications:

- GPS/AVL system
- Real-time traveler/passenger information systems

Potential Benefits:

- Enhanced passenger convenience
- Better on-time performance, early and late arrivals were decreased by 12 and 21% respectively in a Denver study, performance increased from 80% to 90% in Kansas City
- Lower operation and maintenance cost due to smaller fleet size needed, without degradation in customer service

Estimated Costs:

- $3,000 - $6,000 per GPS equipment installation
- $60,000 - $70 million depending on the size of fleets

Influencing Factors:

Political Factors	• Objection from union on adopting ITS due to the increased probability of layoff
Institutional Factors	• Multiple AVL systems may have to be installed for various transit ITS strategies due to limitations from system vendors
Technical Factors	• System compatibility and future upgrade potential • Lack of IT expertise in transit agency to implement ITS due to the lack of understanding of IT in transit • System will get outdated quickly as new technologies come out fast

DKS Associates
TRANSPORTATION SOLUTIONS

FINAL MEMORANDUM

DATE: December 9, 2008

TO: Deena Platman, Metro

FROM: Jim Peters, P.E., P.T.O.E., DKS Associates
Renee Hurtado, P.E., DKS Associates
Jennifer Bachman, DKS Associates

SUBJECT: **TSMO Needs Assessment Methodology** P06097-013

This memorandum articulates how transportation needs that can be addressed through Transportation System Management and Operations (TSMO) should be identified. Three options for needs determination are presented for consideration:

1. graphical presentation of system performance
2. interviews with system operators
3. needs identified in previous plans

Graphical Presentation of System Performance

One of the best ways to show the regional transportation needs of the system is to create maps or other graphics that in essence tell a story about the system. The graphical methods listed here will highlight areas with greater needs and allow the system's operators to visually evaluate the entire system based on specific criteria.

In addition to the graphical options that will be created to help identify areas of need, trends regarding congestion levels, travel times, and traveler delay will be used to demonstrate how the Portland area has changed over the years. These trends will show the importance of working toward innovative solutions to improve the Portland region's transportation system.

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Graphical Option 1: Volume to Capacity Maps

A region wide map of volume to capacity (v/c) ratios will emphasize areas that are congested and close to capacity during the PM peak hours.

Graphical Option 2: Bottlenecks

This graphic or table will identify the worst bottlenecks in the Portland region based on v/c ratios and knowledge from system operators.

Graphical Option 3: Traffic Signal Timing Corridors

A map showing traffic signals that currently have coordinated, traffic responsive or adaptive signal timing will help identify where projects are needed. One way to organize this graphic is to represent each of the following types of corridors in a different color:

- adaptive corridors
- traffic responsive corridors
- corridors with coordinated signal timing implemented within the last 5 years
- corridors with coordinated signal timing implemented more than 5 years ago
- no coordinated signal timing system, but capable equipment
- corridors ideal for coordinated signal timing but missing the appropriate controller equipment or communications between traffic signals

Graphical Option 4: Transit Signal Priority Corridors

This map will show the corridors where transit signal priority currently exists and possibly the corridors where transit signal priority is planned for the future.

Graphical Option 5: Freight Information

This map will identify the freight corridors in the region and the percentage of ADT that is comprised of heavy vehicle traffic.

Graphical Option 6: Freeway and Arterial Incident Locations

The purpose of this graphic (or graphics) is to identify issues regarding incident response and collisions throughout the region. The collision data will primarily focus on freeway crashes for incident response information. Arterial collisions may be investigated as well. These graphics may include:

- incident severity versus duration
- incident types in the Portland region
- map of incidents lasting longer than 90 minutes
- number of lanes affected by incident

- pie charts of type of incident by clearance time (less than 20 minutes, 20 to 90 minutes, and longer than 90 minutes)
- clearance time for fatalities
- rear ends by time of day
- heavy vehicle accidents.

Graphical Option 7: Bicycle Collision Locations

This map identifies high collision locations involving bicyclists to show locations that would benefit from TSMO projects. The information on this map may include:

- location and number of collisions over a given time period
- severity of the collision
- cause of the collision
- environmental factors.

(Note: Accident data collected by the state only includes accidents where a collision took place. In cases where vehicles ran bikes off the road or caused a bike accident without actually striking a bicyclist, the incident was not included in the record.)

Graphical Option 8: Public Parking Facilities

The purpose of this map is to identify locations best suited for advanced parking information systems. This map identifies locations of public parking facilities and potentially the quantity of stalls. Public event facilities will also be included on this map. To determine whether advanced parking information is necessary, several other factors may be illustrated:

- occupancy by time of day
- occupancy by day of week
- occupancy by time of year
- occupancy during special events.

Graphical Option 9: ITS Equipment

This map will show the existing and planned intelligent transportation system (ITS) equipment throughout the Portland metro region.

Graphical Option 10: Communications Infrastructure

This map will show the existing and planned fiber optic cable and twisted pair copper interconnect used throughout the Portland region to support the transportation network and identify gaps in the infrastructure.

Interviews with System Operators

Interviews with system operators will generate a list of transportation system needs based on the experience of the personnel. System operators maintain and operate the roadway system on a daily basis and can readily identify needs not otherwise recognized. Metro already conducted interviews with the following major system operators in the region and summarized the results:

- City of Beaverton
- City of Gresham
- City of Portland Office of Transportation
- Clackamas County
- Federal Highway Administration (FHWA)
- Oregon Department of Transportation (ODOT)
- Port of Portland
- Portland State University (PSU)
- Southwest Washington Regional Transportation Council (RTC)
- Tualatin Valley Fire & Rescue (TVF&R)
- TriMet
- Washington County

Needs Identified in Previous Plans

Previously published studies and unfunded project proposals will identify additional needs that can be addressed through TSMO projects. During their system operator interviews, Metro worked with each stakeholder to identify needs from ITS plans that are still applicable. The TAC will need to provide other studies or funding applications (e.g. MTIP, ODOT Innovative Projects) that include needs addressable by TSMO.