

M E M O R A N D U M

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DATE: April 2, 2008
TO: Metro Council, JPACT, MPAC and Interested Parties
FROM: Kim Ellis, Principal Transportation Planner
SUBJECT: 2035 Regional Transportation Plan – “Cause and Effect” Transportation Investment Scenarios Proposal

This memorandum outlines a recommended approach for analyzing the 2035 Regional Transportation Plan (RTP) “cause and effect” transportation investment scenarios. The analysis will evaluate the effects of distinct transportation policy choices on the future of the Portland metropolitan region. TPAC and MTAC have reviewed the proposal and support moving forward with the analysis.

Action Requested

- Provide input on the overall approach and policy variables to be tested in each scenario.
- Confirm RTP investment scenarios construct.

With Council, MPAC and JPACT support, staff will move forward to conduct the analysis.

Overview

The 2035 Regional Transportation Plan (RTP) “cause and effect” transportation investment scenarios will evaluate the effects of distinct transportation policy choices on the future of the Portland metropolitan region. The analysis will be conducted simultaneously with other *Making the Greatest Place* “Cause and Effect” land use scenarios described in a separate document. The results of the analysis will be reported using the RTP Outcomes-Based Evaluation Framework being developed by Metro staff and the RTP performance measures work group.

Recommendations for the *Making the Greatest Place* effort and RTP policy refinements will be developed based on what is learned through this analysis. The RTP investment scenarios analysis is also intended to be a starting point for the System Development Phase of the RTP process, which includes analysis of 2 to 3 “hybrid” alternatives in 2009. The “hybrid analysis” in 2009 will consider “blended” packages of transportation investments together with different levels of funding and, to the extent possible, land use variations identified through the Urban/Rural reserve track of the *Making the Greatest Place* effort. The “hybrid analysis” will draw from the current RTP investment pool and new ideas/strategies explored in the “Cause and Effect” scenarios to develop more realistic, yet ambitious combinations of transportation investments to implement the 2040 Growth Concept vision and meet state planning requirements. The analysis will inform development of a recommended “state” system of transportation investments and identification of the tools and actions needed to best support the 2040 Growth Concept vision for land use, transportation, the economy and the environment.

Purpose

The RTP investment scenarios analysis is intended to provide policy makers with better information about new 2035 RTP policies and the implications of different transportation policy choices. Major objectives of the analysis are to:

- Evaluate distinct transportation investment policy choices that frame the boundaries of the political landscape and public opinion.
- Test RTP policies to better understand the effect of different transportation investments packages on travel behavior and development patterns.
- Test proposed performance measures to determine which measures can best evaluate whether the transportation system is successful in meeting regional goals and policies.
- Evaluate the relative effect and cost of different transportation investments packages in order to recommend what combinations of investments, tools and strategies are needed to best support the 2040 Growth Concept and other regional goals and policies.
- Provide recommendations to guide RTP System Development ("RTP hybrid analysis" and development of recommended alternative).

Questions to Answer with RTP "Cause and Effect" Investment Scenarios

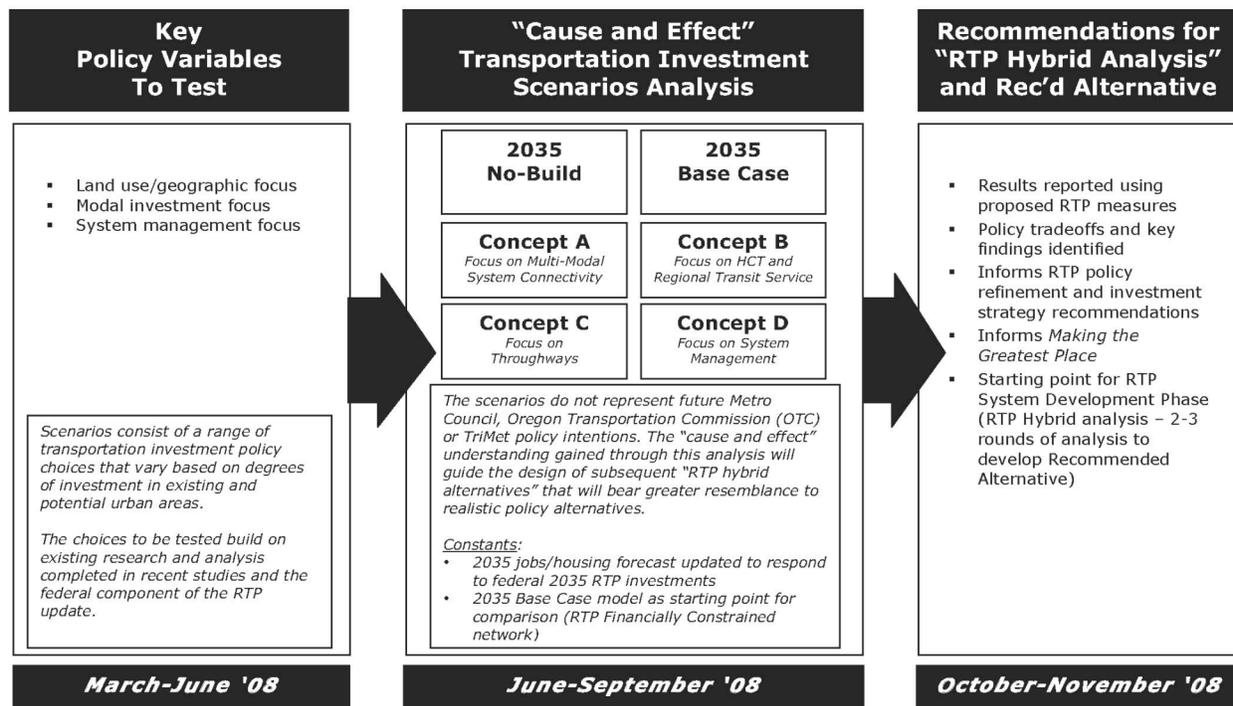
The RTP scenarios will help answer policy questions that forecasted growth and fiscal constraints in the region raise about our ability to protect the region's quality of life and economy for current residents and future generations, including:

- What strategic transportation investments, in which key locations, best support the 2040 Growth Concept vision for vibrant communities, a healthy economy, transportation choices, and a healthy environment in an equitable and fiscally sustainable manner?
- How will future growth affect the reliability of our transportation system in providing for goods movement and access to work, school and other daily destinations?
- How do investments in major highways and transit affect travel behavior and development patterns in the region? What effect do these investments have on neighboring communities?
- What is the maximum potential for reducing drive-alone travel and optimizing performance of the existing transportation system?
- What indicators can best monitor whether the transportation system is successful in meeting regional goals and policies?

General Construct and Scope

This analysis will examine a series of four conceptual motor vehicle and transit systems for their ability to serve forecast 2035 population and employment growth and support the 2040 Growth Concept. Each of the four scenarios is based on a "What if" policy-theme focus from the 2035 RTP, resulting in a distinct mix and level of transit service, motor vehicle system investments and system management strategies in each scenario. *All scenarios will have significantly more service and system investments than the "No Build" system of investments.* **Figure 1** shows the general construct and timeline for this analysis.

Figure 1. RTP Investment Scenarios Construct and Timeline



Each scenario is initiated by a "what if" question:

- *Concept A* - What if we focused our investments on increasing connectivity for all modes of travel?
- *Concept B* - What if we focused our investments to build out the high capacity transit connections identified in the 2040 Growth Concept and to expand regional transit service to complement the new HCT connections?
- *Concept C* - What if we focused our investments on adding new capacity and connections to the region's throughway system?
- *Concept D* - What if we focused our investments on optimizing the existing system and managing demand?

The four scenarios complement one another, and will be compared to the results of a 2035 No Build scenario and a 2035 Base Case scenario that were developed during the federal component of the 2035 RTP update.¹ The 2035 No-Build assumes no new revenue or investments beyond what has already been committed to transportation projects and programs in the region. The 2035 Base Case scenario assumes the 2035 RTP Financially Constrained System of projects and programs adopted by JPACT and the Metro Council in December 2007. **The scenarios do not represent future Metro Council, Oregon Transportation Commission (OTC) or TriMet policy intentions.**

¹ Modeling for the 2035 No Build and 2035 Base Case scenarios was conducted during December 2006-January 2007. The 2035 No-Build assumes no new revenue or investments beyond what has already been committed to transportation projects and programs in the region. The 2035 Base Case scenario uses the 2035 RTP Financially Constrained System of projects and programs.

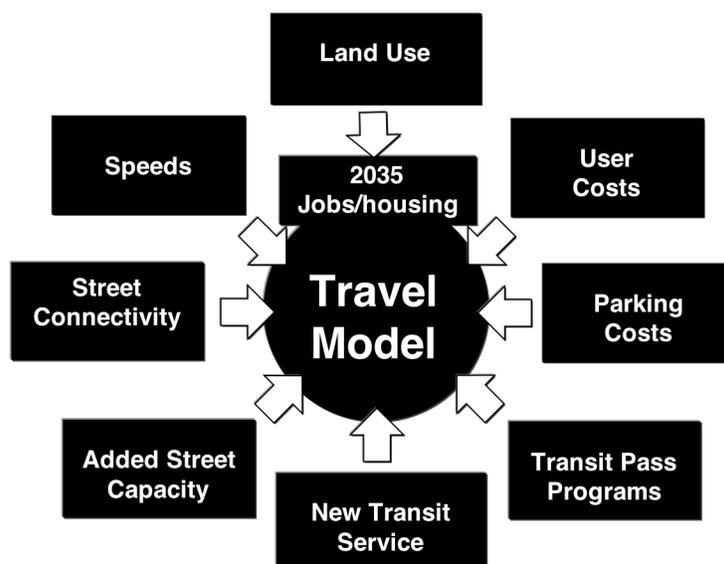
Methodology

MPAC, JPACT and the Metro Council will provide direction on the policy variables to be tested in each of the scenarios. The RTP scenarios will be developed with the regional travel demand model for the purpose of modeling and analysis. The Metroscope model will be used to evaluate the land use and economic effects of each of the transportation networks. This approach will allow a comprehensive analysis of the relative strengths and weaknesses of each scenario in achieving the RTP goals approved by MPAC, JPACT and the Metro Council in December 2007.

Summary of Regional Travel Demand Model

The Metro regional travel demand model forecasts travel volumes, with assignments executed in EMME/3. For travel forecasting purposes, land use assumptions are broken down into geographical areas called transportation analysis zones (TAZs). The EMME/3 model is not sensitive enough to test which policy/pricing/regulatory change is the best, but it can help demonstrate the overall effect of packages of investments. The 2035 land use assumptions will be held constant in the travel demand model for each scenario. In addition, the cost of various forms of transportation, including parking and transit fare costs, and levels of street connectivity are also assigned to each TAZ based on regional transportation and land use policies. The inputs are shown in **Figure 2**.

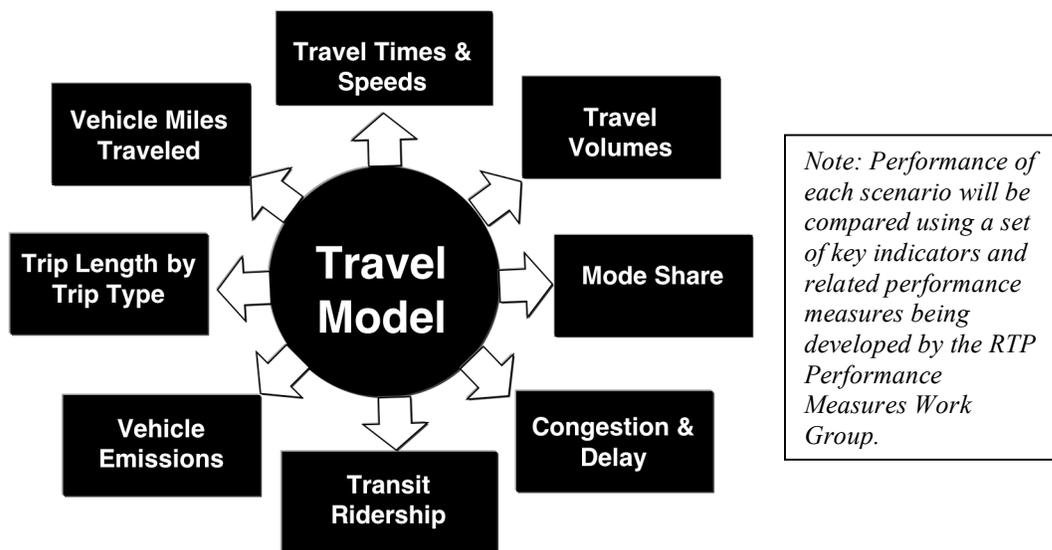
Figure 2. Regional Travel Demand Model Inputs



The regional travel demand model then estimates the number of trips that will be made, the distribution patterns of the trips throughout the region, the likely mode used for the trip and the actual roadways and transit lines used for motor vehicle and transit trips. Traffic volume projections from these simulations help assess transportation system performance. A broad array of model outputs can be generated using the regional travel demand model, including network miles, vehicle miles traveled, travel volumes, transit ridership, transportation-related vehicle emissions, total trips by trip type (purpose) and mode, trip lengths, travel delay and demand-to-capacity ratios (level-of-service) of motor vehicle and transit links.

The outputs can be reported at different geographic scales – region-wide, corridor-level and, in some cases, by 2040 Design Type. *Due to the macro-scopic nature of the regional model, the model does not effectively analyze walking, biking or local street traffic volumes at detailed analysis levels.* A sample of potential regional travel demand model outputs are shown in **Figure 3**.

Figure 3. Regional Travel Demand Sample Model Outputs



Summary of Metroscope Model

Metroscope is a simulation model developed for testing planning policies in the urban land and real estate market. It utilizes extensive data describing attributes of the region's land and economic growth potential in order to mimic the responses of homeowners, renters, commuters, developers and business entrepreneurs to changes in the different attributes – where will people choose to live, work, travel, build new communities and engage in commerce. Data attributes include: land and real estate value, vacant buildable land, redevelopment and infill land, environmental conditions, transportation network features, development trends and population and employment growth projections.

Metroscope includes a built-in transportation model that simulates levels of travel demand and congestion for the region's road and transit system. The transportation model outputs from Metroscope are not as extensive as the outputs that can be drawn from the regional travel demand model, thereby limiting Metroscope's ability to provide detailed information about travel behavior in the region. Metroscope is capable of providing extensive information about the effects of transportation investments on development patterns throughout the region.

Note: Land use and economic effects of each scenario will be compared using a set of key indicators and related performance measures being developed by the RTP Performance Measures Work Group.

While the technical evaluation of the RTP scenarios will generate an extensive array of data, the analysis will focus on more generalized questions of how each scenario responds to basic concerns about growth in the region as expressed in the proposed RTP Outcomes-Based Evaluation Framework. Performance of each scenario will be compared using a set of key indicators and related performance measures being developed by the RTP Performance Measures Work Group. Planning-level cost estimates for each scenario will be developed by Metro, in partnership with ODOT and TriMet.

Process and Products

The RTP Investment Scenarios Analysis will inform the *Making the Greatest Place* effort and state component of the RTP update. Recommendations for the *Making the Greatest Place* effort and RTP policy refinements will be developed based on what is learned through the analysis. The analysis is also intended to be a starting point for developing a recommended "state" system of transportation

improvements and programs. The "cause and effect" understanding gained through this analysis will guide the design and analysis of subsequent "RTP hybrid alternatives" that will bear greater resemblance to realistic policy alternatives in Winter/Spring 2009.

The findings from the analysis will be discussed at a joint JPACT, MPAC and Metro Council workshop in October 2008. Policy conclusions reached at this joint meeting will provide direction to Metro, ODOT, TriMet and local agency staff on the "hybrid alternatives" to be analyzed during the System Development Phase in 2009.

The policy conclusions from the scenarios analysis will be summarized in an RTP Investment Scenarios Analysis report. The report will serve as a tool in RTP public involvement activities beginning in Winter 2008. The first major public outreach for the state component of the RTP update will be a series of workshops – called "structured conversations" – to be held with freight and business interests and community-based organizations. The workshops will be designed to gather input on funding strategies and investment priorities to be included in the "state" system of investments in 2009. The RTP investment scenarios analysis report will serve as an important background document for these workshops.

Timeline

The timeline for the scenarios analysis is designed to meet the Making the Greatest Place and RTP schedules:

| | |
|-------------------------------------|--|
| <i>January – June 2008</i> | <i>Develop proposed RTP outcomes-based evaluation framework & performance measures</i> |
| <i>April 2008</i> | <i>MPAC, JPACT and Metro Council confirm RTP scenarios construct and policy questions to be addressed in scenarios analysis</i> |
| <i>June-August 2008</i> | <i>Prepare and analyze investment scenarios using regional travel demand model and Metroscope²</i> |
| <i>August-September 2008</i> | <i>Compile transportation analysis and summaries in RTP investment scenarios report and identify Making the Greatest Place and RTP recommendations</i> |
| <i>October 2008</i> | <i>RTP Scenarios Analysis Report and recommendations released for MPAC, JPACT and Metro Council discussion</i> |
| <i>December 2008</i> | <i>MPAC, JPACT and Metro Council confirm RTP System Development principles and evaluation criteria</i> <i>System development task begins</i> |
| <i>January-March 2009</i> | <i>Prepare and analyze 2 to 3 RTP "hybrid" investment alternatives using regional travel demand model</i> |
| <i>April 2009</i> | <i>Compile transportation analysis and summaries in RTP Hybrid Analysis report and identify Making the Greatest Place and RTP recommendations</i> |
| <i>May 2009</i> | <i>RTP Hybrid Analysis Report and recommendations released for MPAC, JPACT and Metro Council discussion</i> |
| <i>June 2009</i> | <i>MPAC, JPACT and Metro Council confirm RTP plan elements and direct staff to prepare updated 2035 RTP for public review</i> |

² Staff is working to determine whether sufficient resources exist to conduct Metroscope analysis of transportation scenarios within this timeframe.

Transportation Policy Variables to Test³

Concept A Focus on Multi-Modal System Connectivity

Focus on multi-modal connections throughout the region to test the RTP arterial, bicycle, pedestrian and regional transit service connectivity concepts.

Construct variables to be tested in this concept:

1. 4-lane major arterials spaced approximately 1-mile apart and 2-lane minor arterials and collectors spaced approximately ½-mile apart, where reasonable.
2. Throughway overcrossings spaced approximately two miles apart, where reasonable, to improve access to centers and address congestion at interchanges.
3. Grade separation of railroad and arterial street network.
4. Implementation of the 2008 Transit Investment Plan, South Metropolitan Area Rapid Transit (SMART) Transit Plan and C-TRAN transit plan.
5. Local transit circulators in regional centers.
6. Build out of the regional bicycle and pedestrian systems, including regional trails with a transportation function.

Concept B Focus on High Capacity Transit (HCT) and Regional Transit Service⁴

Focus on build out of high capacity transit connections identified in the 2040 Growth Concept (e.g., Milwaukie LRT, Washington Square LRT, Oregon City LRT, Clark County LRT) and service expansions to complement new HCT connections to test RTP regional transit network concept.

Construct variables to be tested in this concept:

1. Transit system designs to improve coverage, speed and frequencies, address bottlenecks in the system and expand inter-urban connections.
2. HCT connections as defined in the HCT Study, including connections to all regional centers, inter-urban commuter rail to points outside the region and local aspirations.
3. HCT and streetcar network assumptions to be informed by current status of corridor studies.
4. Park-and-ride facilities and transit stations tied to new HCT service.
5. New and expanded frequent bus service on major arterials and 2040 corridors to support new HCT service, including new suburban-to-suburban connections and connections to employment areas (minimum 15-minute service most hours of the day).
6. Expanded streetcar system to complement HCT in the central city and regional centers.
7. Build out of new regional bicycle and pedestrian system connections to transit.

³ Due to the macro-scopic nature of the regional model, the model is not able to effectively analyze some construct variables such as the provision of bicycle and pedestrian facilities or local street connections.

⁴ Additional transit investment scenarios analysis will be conducted through the High Capacity Transit System Plan Alternatives Analysis to test different levels of high capacity transit and bus service coverage and frequency.

Transportation Policy Variables to Test

Concept C Focus on Throughways

Focus on expanded and new throughway connections identified in the 2040 Growth Concept (e.g., I-5/99W Connector, Sunrise Corridor, I-84/US 26 connector) to test the RTP Throughway System Concept.

Construct variables to be tested in this concept:

1. Throughways widened up to 10 through lanes as needed to address congestion and freight bottlenecks.
2. Interchange designs restructured as needed to accommodate additional throughway lanes.
3. New throughways connections up to 6 through lanes as needed (e.g., I-5/99W Connector, Sunrise Corridor, I-84/US 26 connector).
4. Throughway network assumptions to be informed by current status of corridor studies.
5. A "B" version of this concept includes value pricing of new capacity on selected heavily traveled throughway corridors.

Concept D Focus on System Management

Focus on aggressively optimizing and managing the demand of the existing transportation facilities and services in the region to test the RTP Transportation System Management and Operations (TSMO) Concept.

Construct variables to be tested in this concept:

1. Value pricing and/or high occupancy vehicle (HOV)/freight-only lanes on selected heavily traveled throughway corridors to address congestion and freight bottlenecks.
2. Expanded ramp metering on throughways.
3. Signal timing on major arterials.
4. Transit signal priority and other transit-related system management strategies.
5. Access management of major arterials and removal of throughway interchange access to meet Oregon Highway Plan (OHP) interchange spacing standards.
6. Expanded transit pass programs, including "reduced fare zones" in the central city and regional centers.
7. Expanded parking management programs in the central city, regional centers, town centers and employment areas.