

WSDOT Congestion Relief Study

Bi-State Coordination Committee
May 27, 2004

WSDOT Congestion Relief Study

- Requested by Washington State Legislature
- “What would it take to eliminate congestion on the State Highway System?”
- The Study Will:
 - Identify travel demand assuming planned GMA growth
 - Evaluate multi-modal solutions
 - Analyze cost and impacts of congestion relief strategies
- Focus on Puget Sound, Spokane and Vancouver

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Participants

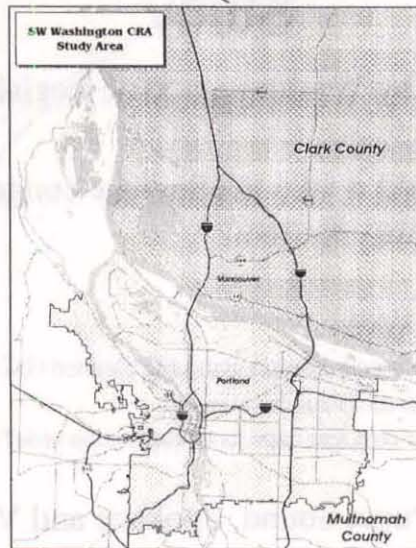
- Lead:
 - WSDOT Urban Planning Office – Seattle

- Consultant:
 - Parsons Brinckerhoff

- Key Participating Agencies:
 - WSDOT Southwest Region
 - RTC
 - C-TRAN
 - Metro
 - Tri-Met

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Study Area



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Range of Options Developed

- No-Action
 - Comparison Point
- Unconstrained Demand
 - Accommodate All Demand
- Bookend
 - Network Supply Attempting to Meet Demand
- Mid-Range Alternatives
 - Multi-modal Mix

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No Action Options

- Assumes Minimal Investment Beyond What is Funded
- Baseline for Comparison With Other Levels of Investment
- Includes Washington State “nickel” Projects, Delta Park Widening, and 99th Street Park and Ride

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Unconstrained Demand Options

- Theoretical Unlimited Capacity for Highway and Transit
- Better Understand Impacts of Unconstrained Demand
- Starting Point for Establishing Bookends

Bookend Options

- Network Supply Matched to Meet Unconstrained Demand
- Attempted to Accommodate Demand
- Developed for Highway, Transit and Pricing



Highway Bookend

- Additional Lanes on Major Existing Roadways
- Columbia River Bridges Widened
 - I-5 – 7 lanes in each direction (now 3)
 - I-205 – 5 lanes each way (now 4)
- Freeways and Major Arterials Widened
 - I-5, I-205, I-84, I-405
 - Mill Plain, 4th Plain, 164th Av., SR14, SR500, SR502, SR503, Padden, Hwy 99...

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Transit Bookend

- Greatly Expanded Local Bus Service
- Transit Priority Corridors
- High Capacity Transit
 - I-5, from Expo Center to 179th
 - I-205, from Parkrose to Central County P/R
 - SR-500/4th Plain from downtown Vancouver to Central County P/R

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Pricing Bookend

- “Pricing” Applied to All Roadways
- Pay-to-drive, With User Charge Based on Level of Congestion
- More Congestion = Higher Fee

Mid-Range Options



- Developed for both Highways and Transit
- “Middle Ground” Level of Investment
- Between Bookend and No-Action
- Multi-modal: Mix of Highway and Transit
- Focus of the Analysis

Next Steps

- Detailed Evaluation of Bookends and Mid-Range Options
- Measurement of Performance:
 - Congestion Impacts
 - Travel Time
 - Accessibility
 - Environmental Impacts
 - Land Use Impact Analysis
 - Cost Effectiveness
 - Overall Benefit and Cost

Outcomes



- Greater Understanding of a Range of Investment in Various Modes, at Various Levels on Congestion and Transportation System Performance
- Cost of Trying to Eliminate Congestion



Summary

- Congestion Relief Study - Requested by State Legislature
- Analysis Comparing Multi-modal Scenarios
- Focused on Reducing Highway Congestion

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WSDOT Congestion Relief Study

- Questions?

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Congestion Relief Analysis

Vancouver Area

Douglas B MacDonald
Secretary of Transportation

Michael Cummings
Manager, Urban Planning Office

December 18, 2003



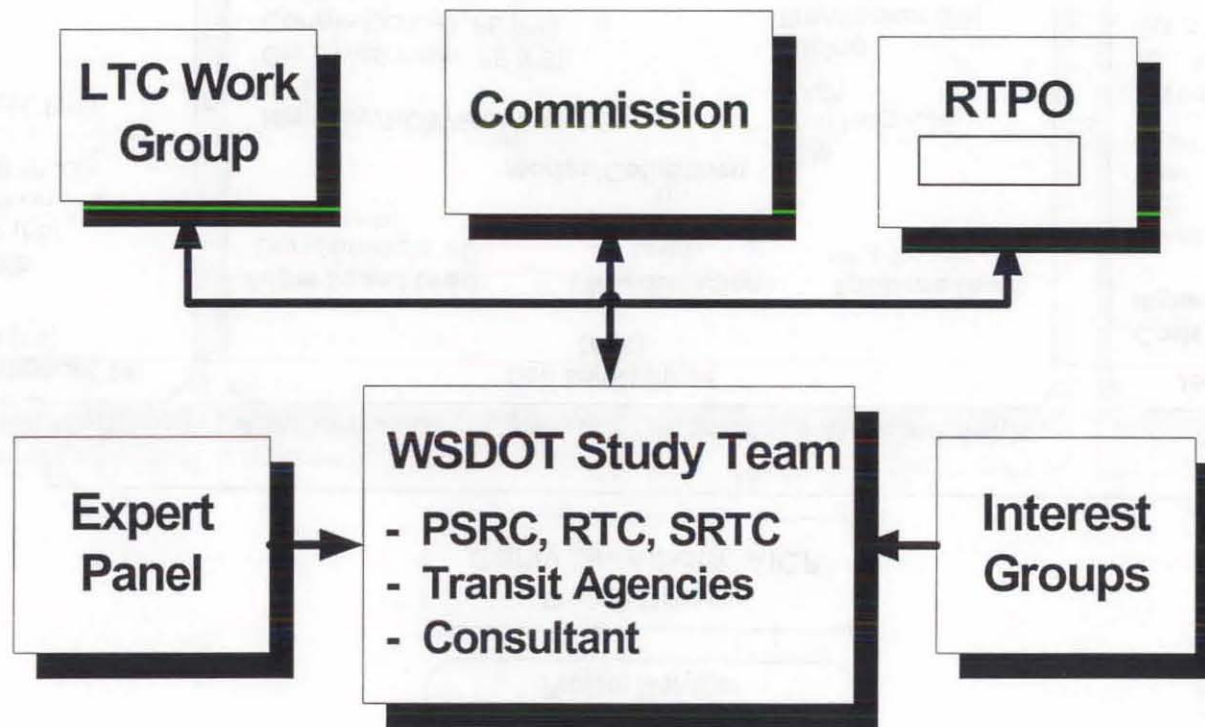
Washington State
Department of Transportation

Purpose of The Analysis

As defined in ESHB 1163 & 2304

- **Identify transportation improvement needs under the growth management plans in the Puget Sound, Vancouver and Spokane regions.**
- **Identify and evaluate potential multi modal solutions to meet the identified needs.**
- **Perform cost benefit analysis of potential solutions for increasing mobility and reducing congestion in the three regions.**

Organization



WSDOT
 Mike Cummings
 Urban Planning Office Manager
 Shuming Yan
 Project Manager

Project Manager
 Cathy Strombom, AICP

Firm Legend:

Parsons Brinckerhoff	PB
Parametrix	PM
X	
Mirai	MI
R	
ECONorthwest	EC

Transportation Modeling

Youssef Deghani, PE, PhD (PB)

Support Staff:
 Murli Adury (PB)
 Joel Freedman (PB)
 Clyde Scott (PMX)
 Natarajan
 Janarthanan, PhD (MIR)

Alternatives Development / Performance Measurements

Don Samdahl, PE (MIR)

Puget Sound Lead: Don Samdahl, PE (MIR)
SW Washington Lead: Chuck Green, PE (PB)
Spokane Lead: Nick Roach (PB)

Modes/Component

Highway/HOV/Managed Lanes
 Chris Wellander, PE (PB)
 Connie Kratovil, PE (PB)

Transit
 Mark Scheibe, PE (PB)

TDM
 Tom Noguchi (MIR)

Pricing
 Brent Baker (PB)

Benefit-Cost
 Brent Baker (PB)

Costs/Impacts

John Perlic, PE (PMX)

Costs Estimates:
Highway: Dave Hildibrant (PMX)
Transit: Mark Scheibe (PB)
TDM: Tom Noguchi (MIR)

Environmental:
 Jan Aarts (PB)
 Daryi Wendie (PMX)

Senior Technical Resources

Chuck Fuhs (PB)
 HOV/Managed Lanes

Randall Pozdena, PhD (ECO)
 Pricing

Sam Seskin (PB)
 Land Use / Transportation Interaction

Tad Widby (PB)
 TDM

Task 1: Project Management / Administration / Meetings

- Project Implementation Plan
- Team Meetings
- Invoices & Progress Reports
- Scope & Schedule Updates

Task 2: Refine Study Objectives, Framework & Analytical Approaches

- Refined Study Framework
- Methodology Reports

Task 3: Develop System Performance Measures & Evaluation Criteria

- Working Paper

Task 4: Perform Base Year Model Runs to Assess Existing Conditions

- Summary of modeling results & performance measures in graphic & tabular form

Task 5: Review 2020 Planned Growth under the GMA

- Summary of 2020 planned growth in graphic & tabular form
- Analysis of densities

Task 6: Perform Model Runs to Assess No-Action Conditions in 2020

- No Action Model Networks
- Full Model Run / Evaluation
- Summarize results in graphic and tabular form

Task 7: 2020 Unconstrained Model Run

- Highway Model Run
- Transit Model Run
- Summarize results in graphic and tabular form

Task 8: Develop & Evaluate Bookend Alternatives to Meet Unconstrained Demands

- Highway
- Transit
- TDM/Pricing
- Summarize Performance Measures
- Benefits & Costs

Task 10: Alternatives Design & Cost Impact

- Cost Methodology Report
- Conceptual Design of Alternatives
- Cost Opinions Report (All Modes/TDM)
- Risk & Mitigations
- Project Phasing

Task 9: Develop & Evaluate "Mid" Alternatives

- Assess TDM and Transit Effects
- Highway Needs Evaluation
- Highway Corridors Improvement Definition
- Summarize Performance Measures
- Benefits & Costs

Task 11: Analysis Documentation & Presentation

- Background
- Technical Analysis
- Summary of Findings

Project Kickoff Meeting

2nd Commission/TPB Presentation

3rd Commission/TPB Presentation

4th Commission/TPB Presentation

Stakeholder Feedback

Transportation Commission Meetings / Transportation Policy Boards

Oct. 2003

Nov

Dec / Jan

Feb / Mar

Apr / May

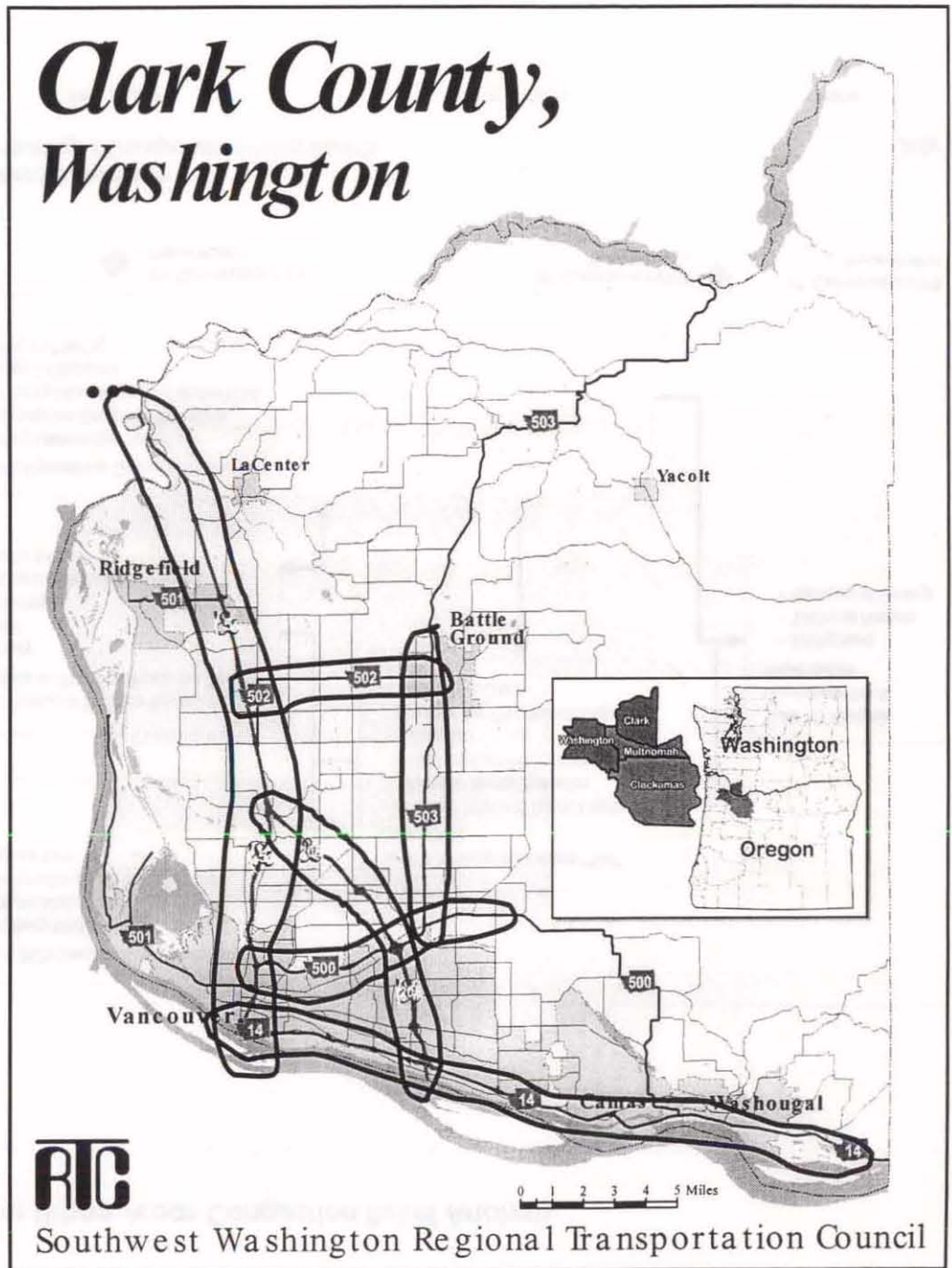
June

July 2004

Study Area

Southwest Washington Possible Corridors for Analysis

- Interstate 5
- Interstate 205
- State Route 14
- State Route 500
- State Route 502
- State Route 503



General Approach

Existing system performance - baseline condition

The cost of doing no more than the funded projects by 2020

The price of meeting "unconstrained demand" in 2020

The max. transit/TDM/pricing effect on congestion relief

Various approaches to congestion relief:

With optimum TDM, transit, and pricing strategies in place, how much highway improvement is needed to achieve a particular level/s of congestion relief?

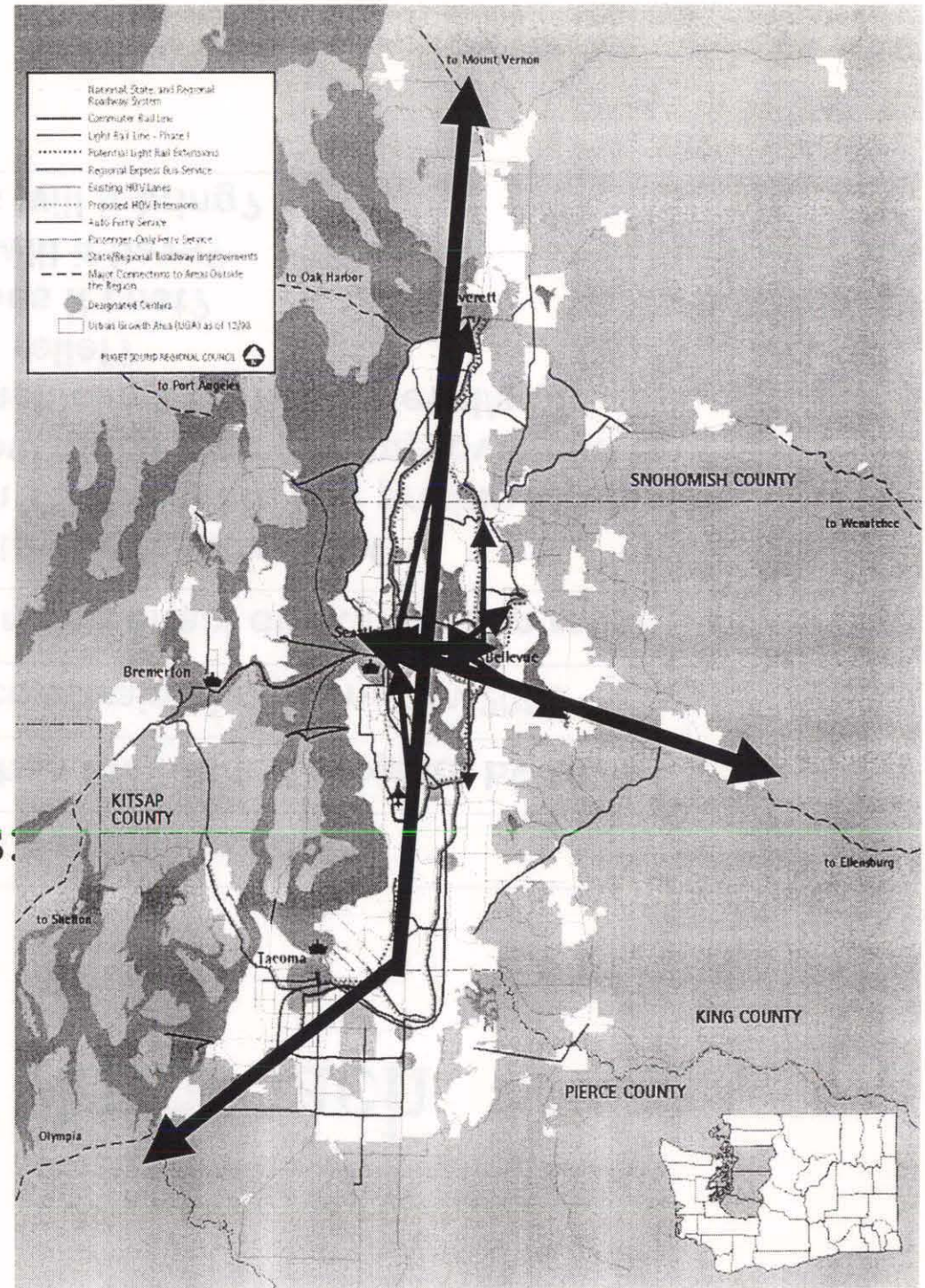
How much does it cost?

What impact will it have?

What benefits will it bring?

Approach

- Travel Demand on Corridors
 - Activity center access and connectivity
 - Through trips
- Unconstrained Analysis
 - Roadway
 - Transit/TDM
 - Pricing

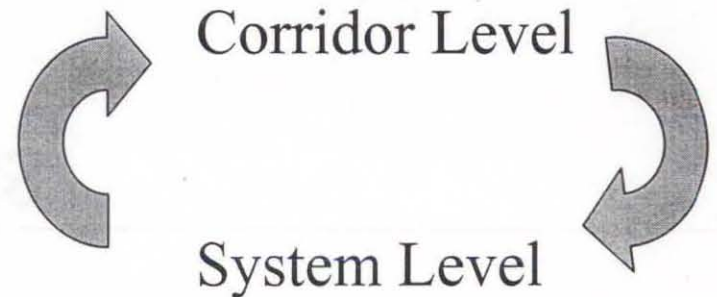
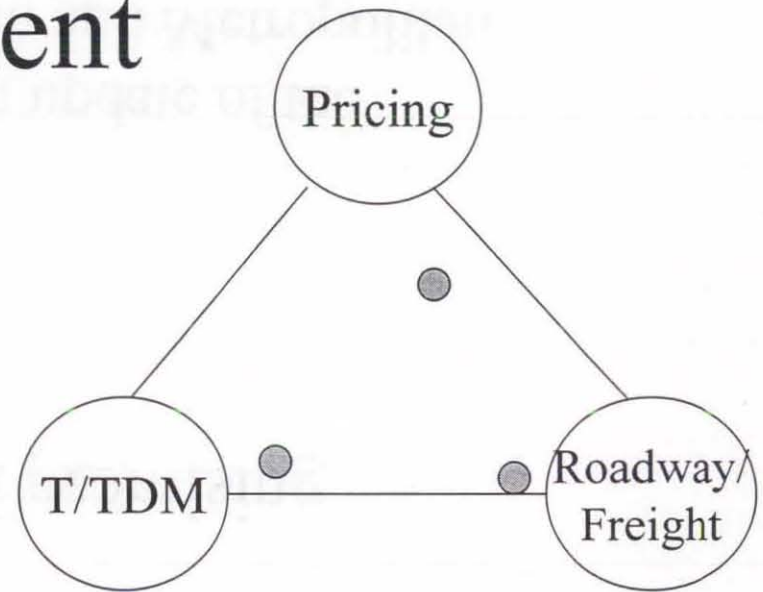


Approach- Alternatives Development

- Corridor Level Strategies
Combining various levels of Roadway with given set of pricing, transit/TDM.

*Different corridors & metro areas
will have different strategy sets*

- Metro-area
 - Corridor role-ups and integration



Products

- Alternatives for reducing congestion at various levels of investments
- Cost-Benefit/Effectiveness of promising alternatives
- Data:
 - Not produce a plan
 - Information that will be used in update of the Washington Transportation Plan and Metropolitan Transportation Plans.

9-17-03 Dean, Yan, Mike & John

McConnaughey, John

From: Thompson, Laura Ann
Sent: Thursday, September 11, 2003 8:40 AM
To: Clark, Mike; McConnaughey, John
Cc: Yan, Shuming
Subject: RE: consultant information session scheduled

-----Original Message-----

From: Yan, Shuming
Sent: Wednesday, September 10, 2003 10:11 AM
To: Rohwer, Mark; Clark, Mike
Cc: Cummings, Michael; McConnaughey, John; Bennett, William; Thompson, Laura Ann
Subject: consultant information session scheduled
Importance: High

FYI - here is the list of the consultants that we requested to submit proposals:

Cambridge Systematics
CH2MHILL
HDR
HNTB
Mirai Associates
Parametrix, Inc
Parsons Brinckerhoff

WSDOT Consultant Project Information and Proposal Guidelines

Project Title: Urban Areas Congestion Relief Analysis

Task Title: Transportation Modeling, Alternative Conceptual Design and Cost/Impact Estimates

Specialty Service, if applicable: Transportation Modeling including TDM, transit, pricing and roadway components and Design

Contact: Shuming Yan

Project Summary:

The 2003 state legislature directed WSDOT to conduct a study of regional congestion relief solutions for Puget Sound, Spokane, and Vancouver. It requires that "The study must include proposals to alleviate congestion consistent with population and land use expectations under the growth management act, and must include measurement of all modes of transportation" (ESHB 1163 Sec. 222(3)). See attached Initial Scope of Work.

Estimated Budget: \$2.0 million.

Deliverables Summary: Transportation system performance report on existing, future no-action and various action scenarios. The performance measures will include benefits, cost and impacts.

Geographic Location: The Project covers three MPOs regions including Puget Sound, Spokane and Vancouver.

Approximate Start/End Dates: October 2003 through July 2004.

Desirable Project Consultant Attributes: Availability, responsiveness, ability to deliver within the timeframe, report writing, depth and breadth of experience in travel demand modeling, multimodal transportation system planning, transportation alternatives conceptual design and cost/impact estimation. Consultant should also have a familiarity with the transportation planning issues and models in all three geographic areas listed above.

In particular, based on the initial scope of work, prospective consultants should address the following questions/issues in depth in their proposals:

1. Performance measures and evaluation criteria:
 - What performance measures and evaluation criteria would you deem appropriate for this analysis?

- What direct and indirect benefits, costs and impacts would you provide for the various alternatives described in the Scope of Work?
 - The tools that you would propose to use in order to perform the analysis on each of the various modal improvement sets.
2. Modal evaluation: how would you approach the evaluation of all transportation modes, including TDM, congestion pricing, transit (bus and rail) and roadway individually and in combination?
 3. Alternative conceptual design and cost estimates: discuss how you would approach alternatives conceptual design, cost estimating and risk assessment.
 4. The MPO's in all three urban areas use EMME-2 based models. It is assumed that these models will be primary tools for the travel demand analysis. Although consultant assistance will be required for all three urban areas, the type and level of support needed may also differ between areas. The response to the tasks in this draft scope should:
 - Discuss your firm's capabilities in each of the three urban areas and outline how you would propose to address differences between the three urban areas.
 - Outline a management plan to achieve a reasonable level of consistency in analysis between the three urban areas.
 5. This is a complex study with many components that could be major studies of their own. How would you make this complex study simple enough to be completed within the short timeline and still be able to communicate its' results to elected and appointed officials and other interested parties?

Draft Agenda
Vancouver Congestion Relief Analysis
September 17, 2003

Purpose: To begin discussions on how to do the Vancouver area Congestion Relief Analysis.

1. Review the draft scope of work for the Congestion Relief Analysis.
 - Breakdown of who we would like (WSDOT staff, RTC staff, contractor) to perform the Vancouver analysis. Role if any for Portland Metro.

EMME-2 Runs Baseline, Unconstrained, Modal, Pricing, and TDM Alternatives

Highway and Modal Cost Estimates

TDM Traffic Analysis and Cost Estimates. Pricing Analysis – Need to determine specific alternatives to analyze and how much Oregon

Alternatives to include

High Capacity Transit (LRT, HOV, & Frequent Bus) Analysis and Cost Estimates.

- What corridors? Propose I-5, I-205, SR-14, SR-500, SR-503 at a minimum Others? – SR 502, Mill Plain, Padden, 164th
- Turning Lemons into Lemonade – What can we get out of this locally?

-Start on modeling, data, cost estimates and further definition for LRT Alternatives analysis, I-5 TDM Plan, and tolling analysis for I-5 & I-205 Bridges.

- Unconstrained Analysis Issues

I-5 & I-205 With and without capacity expansion in Oregon?

Reopen 3rd Crossing/West Arterial/Port to Port Issues?

2. Coordination with Seattle/Spokane, with contractors, and with “Special Interests”
 - What groups need to receive a presentation? RTC Board, PAG, Bi-State Committee, TPAC, JPACT?
 - Should we have a separate TAC to review Vancouver Analysis with consultant?

Urban Areas Congestion Relief Analysis

Initial Scope of Work

Purpose:

The goal of this effort is to fulfill the analytical requirements of ESHB 1163 Sec. 222(3), ESHB 2304 Sec. 404 (1) and (2), as well as meeting the intent of SB 5987 Sec.14 to:

1. Study regional congestion relief solutions for the Puget Sound, Spokane, and Vancouver metropolitan areas consistent with planned growth under the Growth Management Act;
2. Identify, measure, and evaluate all modes of transportation as potential solutions to alleviate congestion
3. Develop a system performance report and cost, impact and benefit analysis of various levels of congestion relief strategies.
4. This is not a plan development process. It is not intended to make improvement recommendations (which is the role of the WTP update which will be started soon). Rather, the analysis will focus on answering questions such as what does it take (in terms of cost and impact) to achieve a particular level/s of congestion relief?

Background:

The 2003 state legislature directed WSDOT to conduct a study of regional congestion relief solutions for Puget Sound, Spokane, and Vancouver. It requires that "The study must include proposals to alleviate congestion consistent with population and land use expectations under the growth management act, and must include measurement of all modes of transportation" (ESHB 1163 Sec. 222(3)).

Congestion relief analysis is not a new requirement. In 2002, ESHB 2304 required that WSDOT and the Transportation Commission "shall use the transportation demand modeling tools . . . to evaluate investments based on the best mode or improvement, or mix of modes and improvements, to meet current and future long-term demand within a corridor or system for the lowest cost." (ESHB 2304 Sec. 403 and 404 and RCW 47.05.035).

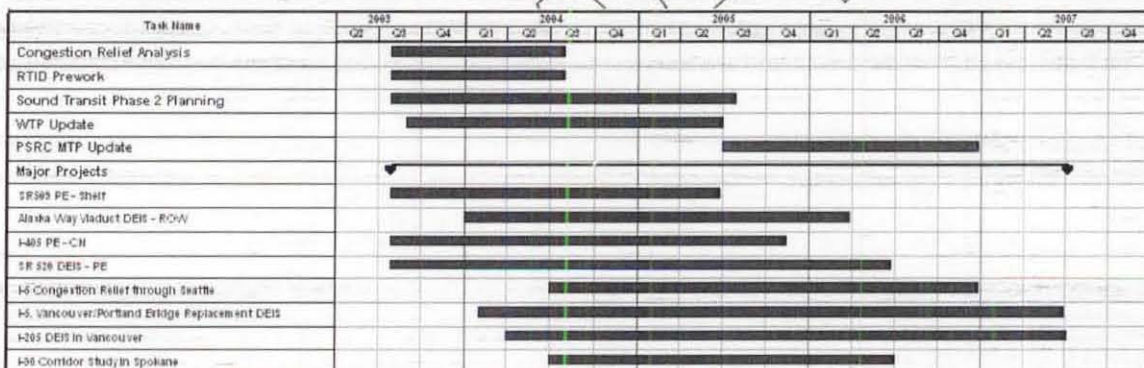
Given the requirements of ESHB 2304 and ESHB 1163, it is evident that solutions considered in the congestion relief analysis should not be limited to highways; and the cost (including social and environmental impacts) to implement the solutions and the benefits expected from the solutions should be important criteria in evaluating these solutions.

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As this analysis is underway, there are several separate and yet somewhat related efforts also in the works. Statewide, the WTP update to be started in fall of this year. In the Puget Sound area these efforts include the RTID preparation work that leads to a September or November ballot; Sound Transit Phase 2 Planning that is expected to be completed in summer of 2005; and several other “mega” projects that are currently underway. In the Vancouver area these efforts include updating the Clark County Comprehensive Plan in Fall of 2003, and beginning the next phase of the I-5 Partnership DEIS. In Spokane area, if funding is secured, the I-90 corridor study could start in mid 2004. The chart below summarizes these efforts and timelines:

These efforts include the RTID preparation work that leads to a September or November ballot; Sound Transit Phase 2 Planning that is expected to be completed in fall 2004; the WTP update to be started in the Fall of this year; and several other “mega” projects that are currently underway. The chart below summarizes these efforts and timelines:

Figure 1. Regional Planning and Major Projects Activities



Analysis Structure

It is assumed that WSDOT will lead and primarily staff the project (with consultant/s help). The Puget Sound Regional Council, Spokane Regional Council, and the Southwest WA Regional Transportation Council in Vancouver will serve as a sounding board for input and feedback. Modeling staff from the three TMAs will serve as technical advisors for modeling analysis. An expert panel consisting of well-known transportation experts in the state will be assembled to review and critique the analysis methodology and draft results.

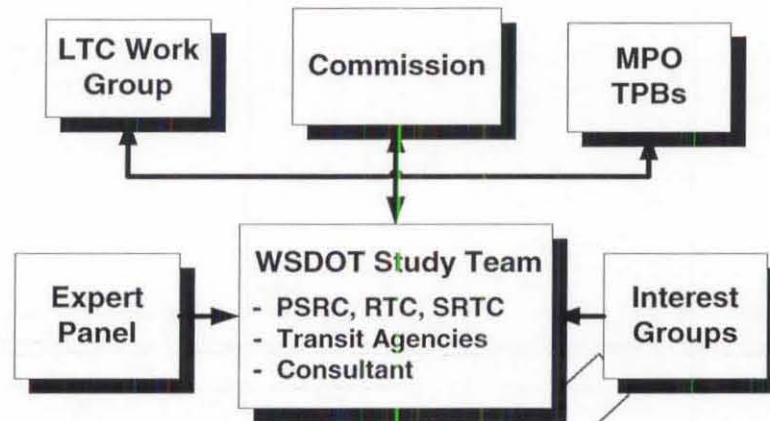
The Transportation Commission and the MPOs’ Transportation Policy Boards will be briefed at major study milestones. The study findings may also be presented to special interest groups for input and feedback. Since this is primarily a data driven technical

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exercise, no major public involvement is envisioned throughout the process except engaging limited stakeholder groups.

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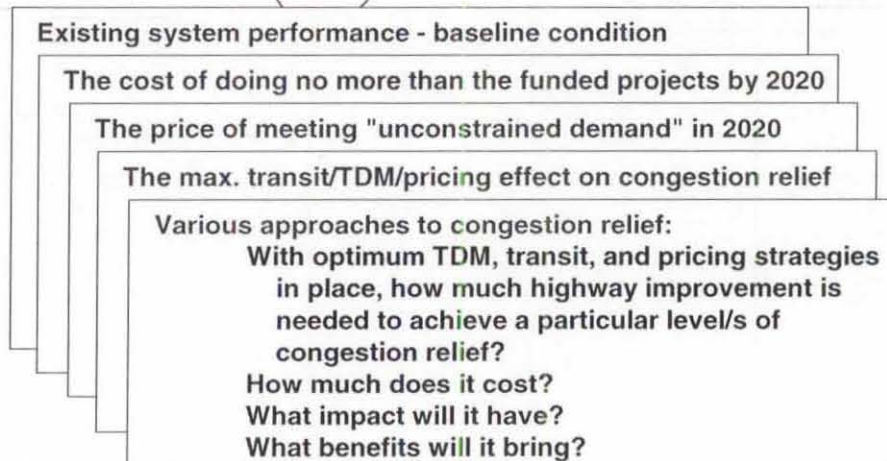
Figure 2. Analysis Structure



Final Product:

The final product will be a technical report that summarizes the assumptions, analysis, and alternatives performance under existing and future build and no build scenarios. It will also include summary information for presentations at TPBs, Commission, LTC and special interest groups. The final report will include the following elements:

Figure 3. Analysis Product/Documentation



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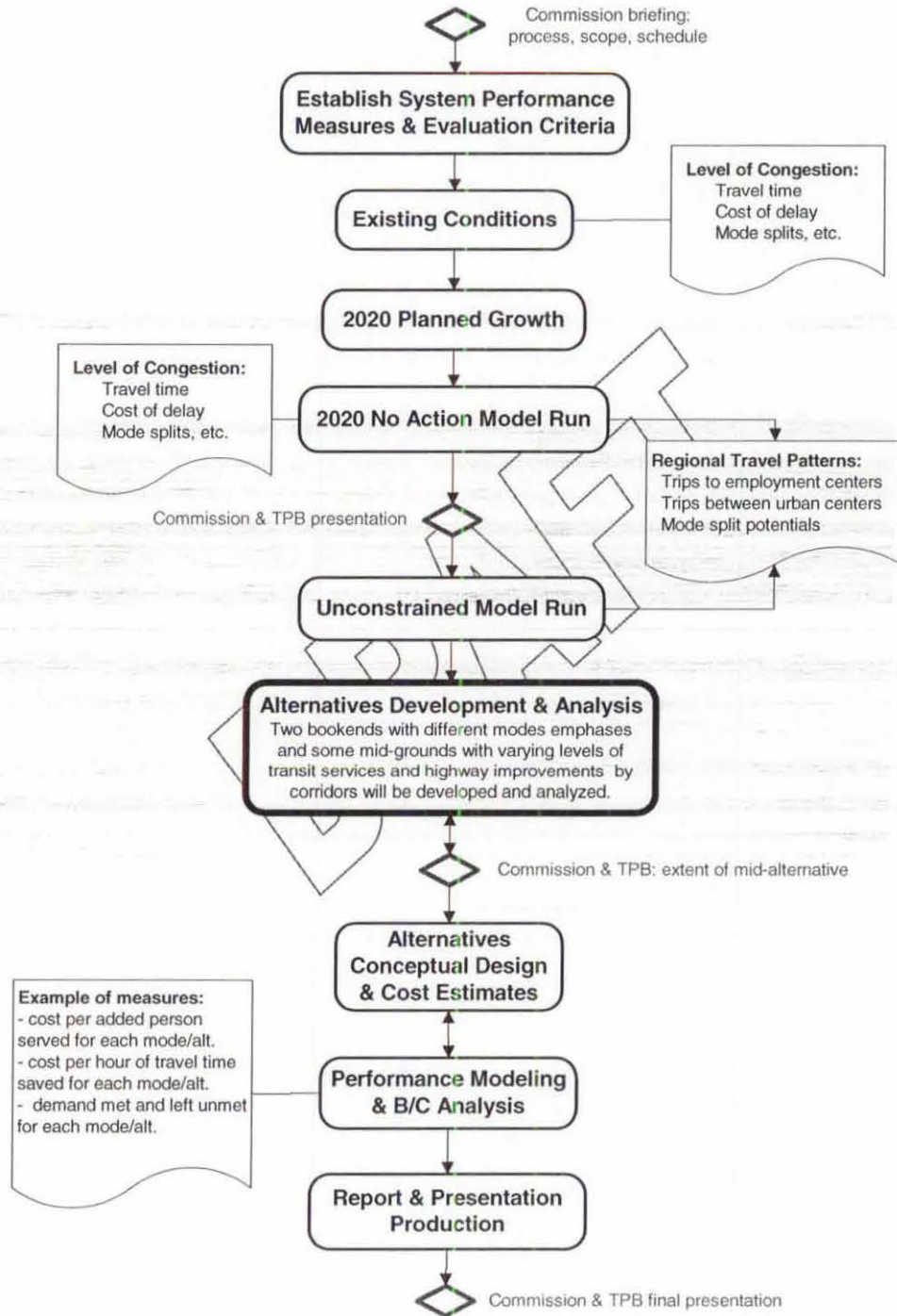
Scope of Work:

The analysis will include the following 10 tasks in addition to four presentations to the Transportation Commission as well as the TPBs at key milestones during the analysis:

- Commission & TPBs presentations on 1) analysis process, structure and scope;
 1. Develop system performance measures and solutions evaluation criteria
 2. Perform base year model runs to assess existing conditions
 3. Review jurisdictions' planned growth in 2020 under the GMA
 4. Perform model runs to assess system performance of no-action conditions in 2020
- Commission & TPBs presentations on existing and future no-action system performance.
 5. Perform capacity unconstrained model runs to assess unconstrained demand in 2020
 6. Develop bookend alternatives that will meet the 2020 unconstrained demand
 7. Develop conceptual design and cost/impact assessment for the Bookend alternatives
 8. Develop "mid" alternatives that include an "optimum" mix of TDM, transit, pricing, and different levels of roadway improvements to achieve various levels of congestion relief
- Commission and TPB status report: Presentation on bookend alternatives and the extent of improvement needs of mid alternatives.
 9. Develop conceptual design and cost/impact estimates for the Mid-ground alternatives.
 10. Document the analysis and present the results to decision makers, MPOs, and appropriate stakeholder groups at key milestones.
- Commission and TPB final report: Study wrap-up - Presentation on mid alternative system performance measures and cost/benefit analysis result.

These tasks and the relationship among them are shown on the next page. Following the chart is a more detailed description of these tasks and how they can be carried out.

Figure 4. Congestion Analysis Process



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Task 1: Develop system performance measures and solution evaluation criteria

This task involves two parts: define system performance measures and develop solution evaluation criteria. The system performance measures will be used to assess existing conditions, future no-action conditions, and various build conditions in 2020. The alternative evaluation criteria will be used to evaluate multi-modal solutions and strategies. The criteria are expected to include all the system performance measures plus additional items. The criteria, at a minimum, must cover the elements that are required by the RCW. The product of this task is a set of system performance measures and evaluation criteria that include but are not limited to the following:

- The amount of travel demand in person trips that will be met and left unmet.
- Potential project level impacts on business and residential properties, wetlands, wild life habitat as well as air quality impacts.
- Cost to implement the projects/strategies, including PE, ROW, construction, environmental mitigation and operation and maintenance costs expressed in present values.
- Individual corridor and/or system wide total person and vehicle hours of delay per day reduced
- Individual corridor and/or system wide vehicle miles traveled
- Individual corridor and/or system wide truck hours of delay/day reduced
- Individual corridor and /or system wide safety benefits
- Congestion relief and safety benefits expressed in present values
- The daily cost per added person served for each improvement proposed to meet demand
- The cost per hour of travel time saved per day for each improvement proposed to meet demand
- Cost to benefit ratios.

Task 2. Perform base year model runs to assess existing conditions

This task involves running the 2000 base year model to assess and summarize existing conditions using the performance measures developed in Task 1. The base year model outputs will be validated using real time data to ensure the model can reasonably replicate existing conditions. The product is a set of performance measures for the existing condition, which will be used as a baseline to compare future no-build and various build

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scenarios. Modal usage, such as transit, carpool and single occupancy vehicle information in major corridors will be assessed.

Task 3. Review 2020 planned growth under the GMA

Travel demand is directly linked to land use. The 2003 legislative appropriation bill requires that "The study must include proposals to alleviate congestion consistent with population and land use expectations under the growth management act..." The population and employment projections and their allocations in three TMAs will be reviewed and summarized to set the stage for the congestion analysis. The summary should highlight regional strategies in achieving highway density development and preventing sprawl.

VISION 2020 is the regional growth, transportation and economic strategy in the Central Puget Sound Region. It is the product developed from years of coordination and corporation among Puget Sound Regional Council and its member jurisdictions. It includes important regional growth strategies such as preserving and developing compact communities, redeveloping urban transportation corridors, and directing employment and housing growth into centers that support walking, biking, and transit use. The product of the plan review is summary information of population and employment historical patterns and future growth forecasts/allocations. The information will be used as the foundation for the congestion analysis. The Clark County Comprehensive Plan is the regional growth, transportation and economic strategy for the Vancouver urban area.

Task 4. Perform model runs to assess no-action conditions in 2020

This task is very similar to Task 2 except the analysis year is 2020. It involves assigning future 2020 travel demand to the transportation network. This network includes existing plus any funding committed transportation projects (referred to as E+C network, primarily existing network plus Sound Transit Phase 1 and the "Nickel Projects"). It involves the following subtasks:

- 4.1. Develop 2020 no action model network (or E+C network) by adding funding secured highway and transit projects into the base year network.
- 4.2. Perform full model run of the 2020 E + C network in Task 4.1. Evaluate and summarize the system performance using the measures developed in Task 1.
- 4.3. Summarize modal usage information by major transportation corridors.

➤ Second Commission/TPB presentation: assessment of existing and future no-action conditions.

Task 5. 2020 unconstrained model run

This task involves assessing the future year's unconstrained demand for highway capacity and transit service. This task will be accomplished by removing the capacity

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constraints from the 2020 no-action network and re-running Trip Distribution, Mode Split and Traffic Assignments. It includes the following subtasks:

- 5.1. Unconstrained highway capacity model run: remove highway capacity constraint from the model and perform a full model run.
- 5.2. Unconstrained transit capacity model run: set the transit headways on all transit routes to 5 minutes while assuming no highway improvements would be made and perform a full model run..
- 5.3. Summarize unconstrained highway and transit demand information by major corridors. The product of this task is a set of unconstrained demand in terms of vehicles/hour and passengers/hour for each of the major transportation corridors in the three regions. The unconstrained travel demand will be used in developing bookend alternatives as described in the Task 6.

Task 6. Develop bookend alternatives for meeting unconstrained demands

This task involves developing two bookends. The first element of this task is to do a literature search and data analysis to identify current practices in the country including the maximum achievable market share of transit and TDM relative to land use density. Literature search findings will be compared to the results of unconstrained transit model runs for a reasonableness check. The second element of this task is to apply these maximum market shares to develop bookend alternatives.

One bookend is an alternative that consists of the maximum TDM, congestion pricing (build on the findings from the Central Puget Sound Pricing/Toll study currently under way) and transit improvement strategies that would take the highest share of the travel market. The other bookend is an alternative that consists of a minimum (today's level) of TDM, pricing, and transit share of the travel market. The number of additional lanes on each highway needed to carry the remaining unconstrained travel demand will be quantified for both alternatives.

Task 7. Bookend alternatives conceptual design and cost/impact assessment

To support initial assessment of the cost and impacts of the bookend alternatives, highway improvement needs will be sketched out with appropriate detail. Roadway costs and impacts should include the following items:

- Hard dollar costs of design, right of way acquisition and construction of projects as well as costs to maintain the facility afterwards.
- Prerequisites to construction permitting relative to avoidance and mitigation of other social/environmental impacts
- Likely right-of-way requirements in terms of potential displacement of residential and business properties.

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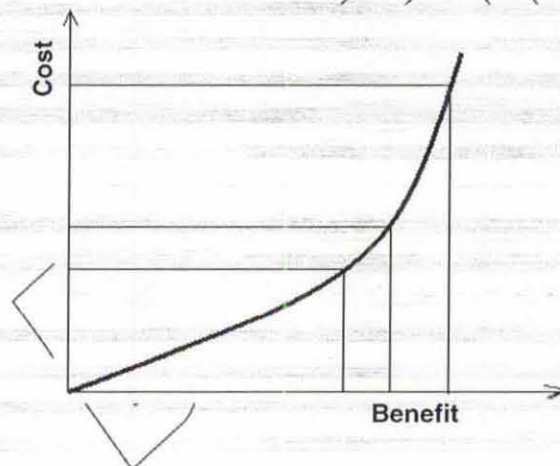
To expedite the process, this effort should build on the existing work already done as part of RTID and/or mega project corridor studies. After the project estimate and schedule have been developed, a panel of experts, will be assembled to perform a Cost Risk Assessment.

For transit, the cost will include capital, maintenance and operation over a 20-year period. It will be estimated based on the existing cost data expressed in total cost and average cost per service hour by bus, light rail, and commuter rail.

Task 8: Develop “mid” alternatives that include TDM, pricing, and different levels of transit and roadway improvements to achieve various levels of congestion relief

The analysis of the bookend alternatives will likely reveal that meeting unconstrained demand is an expensive goal (financially, environmentally, and /or politically) to attain.

Figure 5. Investment Efficiency Curve

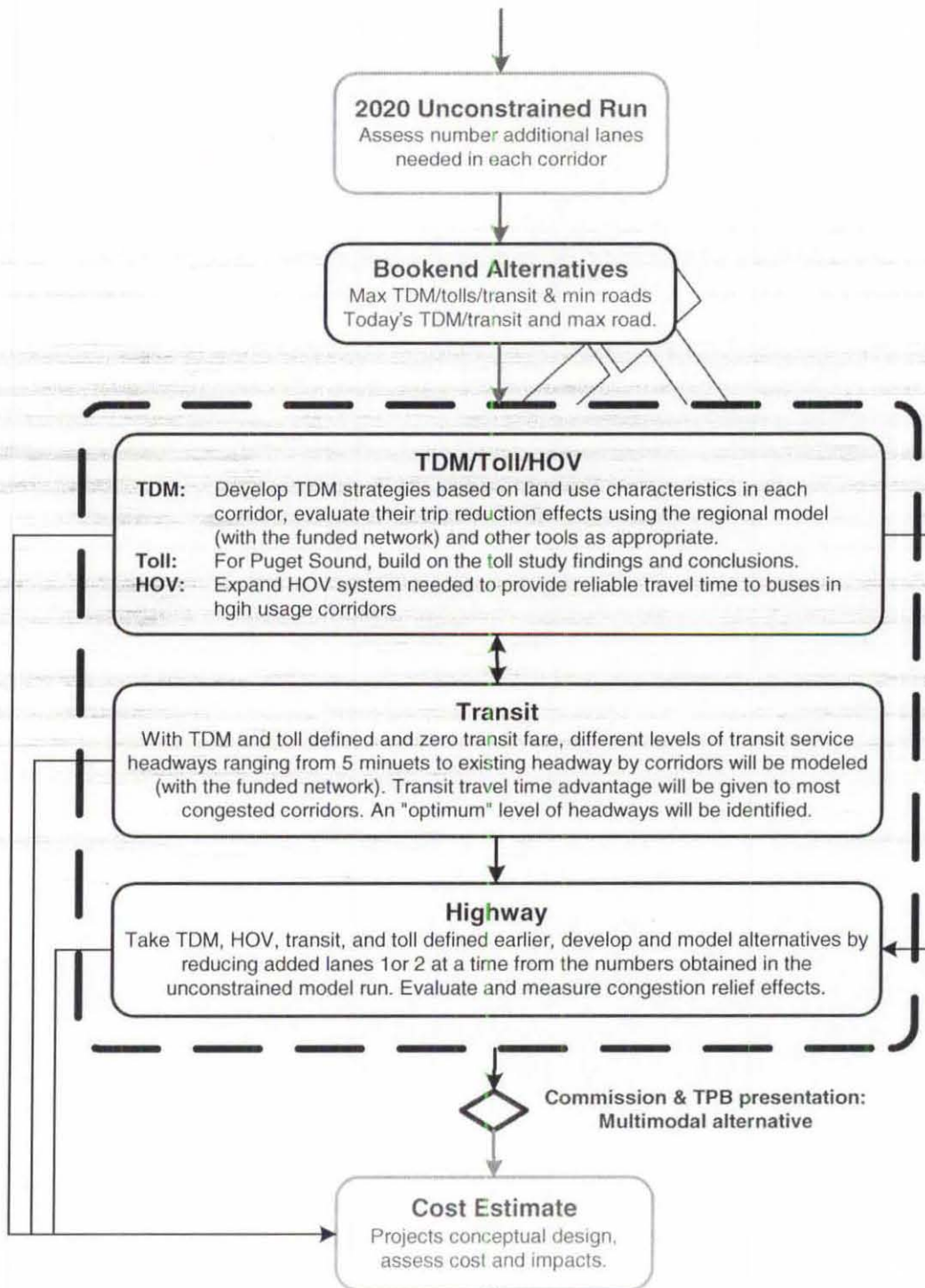


As the above chart shows, differing levels of congestion relief may trigger disproportional large increments of investment requirement. The law of diminishing return is likely to apply to marginal improvement at increasing levels of congestion “relief.” To help illustrate this point, different levels of transportation improvement strategies will be evaluated. This task will be accomplished as depicted on the diagram on the next page. It includes the following subtasks:

- 8.1. Assess TDM effect on congestion relief - develop and evaluate a list of TDM strategies to determine those that can be modeled and those that can't be. The “modelable” strategies (including the provision of additional HOV facilities) will be identified and evaluated using the regional travel demand forecast model with no-action GP network. Those un-modelable strategies will be evaluated external to the regional model to quantify their effect on vehicle trip reduction. To accomplish this, tools and methodologies to evaluate “unmodelable” strategies will need to be identified, assessed and utilized.

8.2. Assess congestion pricing/toll effect – build on the regional pricing/toll study currently under way.

Figure 6. Modal Alternatives Development and Evaluation



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- 8.3. Assess transit effect on congestion relief: review the transit ridership results from the two bookend model runs. If the difference in ridership between the two alternatives is large enough to warrant testing of varying intermediate levels of transit services, pursue it as described below: create 3-5 middle transit alternatives by scaling the transit headways between the existing headways and five-minute headways. Evaluate the middle transit alternatives in conjunction with the modelable TDM strategies identified in Task 8.1 using the respective regional travel demand forecast model with "E+C" network (no-action GP network). Since the highway network is basically the no-action network, it is conceivable that transit travel time will be long and unreliable because many buses travel on GP lanes, it is necessary to provide transit with reliable travel time (via HOV lanes, exclusive row, etc) to gain insight on full potential of transit ridership.
 - 8.4. Estimate the costs associated with maintaining and operating the transit levels of services analyzed in Task 8.2. by applying average cost per service hour (obtained under Task 7) to the total service hours of each alternative. Identify the alternative that maximizes overall transit ridership while minimizing the overall cost. The TDM and transit components of this alternative will be fixed and used in the highway needs evaluation.
 - 8.5. Highway needs evaluation: taking the TDM and transit components identified in Task 8.4 and "E+C" highway network, run "all or nothing" assignment to assess highway improvements needed to serve the remaining travel demand. The number of additional lanes needed to serve the vehicle demand between major activity centers will be evaluated and quantified.
 - 8.6. Develop highway corridors incremental improvement options by reducing the number of lanes added 1 at a time from the numbers obtained in Task 8.4. Run the incremental highway improvement alternatives and evaluate their system performance using the criteria developed in Task 1.
 - 8.7. Document the methodologies and summarize the model results in suitable detail to permit their transparent verification and validation by professional and lay observers.
- **Third Commission and TPB presentation: assessment of "unconstrained" demand and the extent of "needs" in 2020. Review congestion relief effectiveness of various transportation improvement strategies.**

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Task 9. Alternatives conceptual design and cost/impact estimate

Congestion relief solutions developed in Task 8 will need to be designed with sufficient detail to support initial assessment of construction requirements using the impact and cost assessment portion of the performance criteria developed in Task 1. Construction requirements will be expressed in the following terms:

- Hard dollar costs of design, right of way acquisition and construction of projects as well as costs to maintain the facility afterwards.
- Prerequisites to construction permitting relative to avoidance and mitigation of other social/environmental impacts
- Likely right-of-way requirements in terms of potential displacement of residential and business properties.

To expedite the process, this work should be accomplished by building on the cost estimates of the bookend alternatives and the existing work already done as part of RTID and/or mega project corridor studies. After the project estimate and schedule have been developed, a panel of experts, will be assembled to perform a Cost Risk

Task 10. Analysis documentation and presentation preparation

The information developed in this analysis will be summarized in presentation material that can be easily understood by the public, be posted on web sites, provided to newspapers for articles, and given in presentations to community groups. The documentation should include the following three parts:

- A background piece that summarizes the background information including legislative requirements and the three GMA plans, etc.;
- A technical piece that documents the assumptions, methodologies and analysis results; and
- A summary report that documents major analysis findings and conclusions. As part of this summary documentation, a presentation will be developed for presentation at TPBs, Commission, LTC and interested groups.

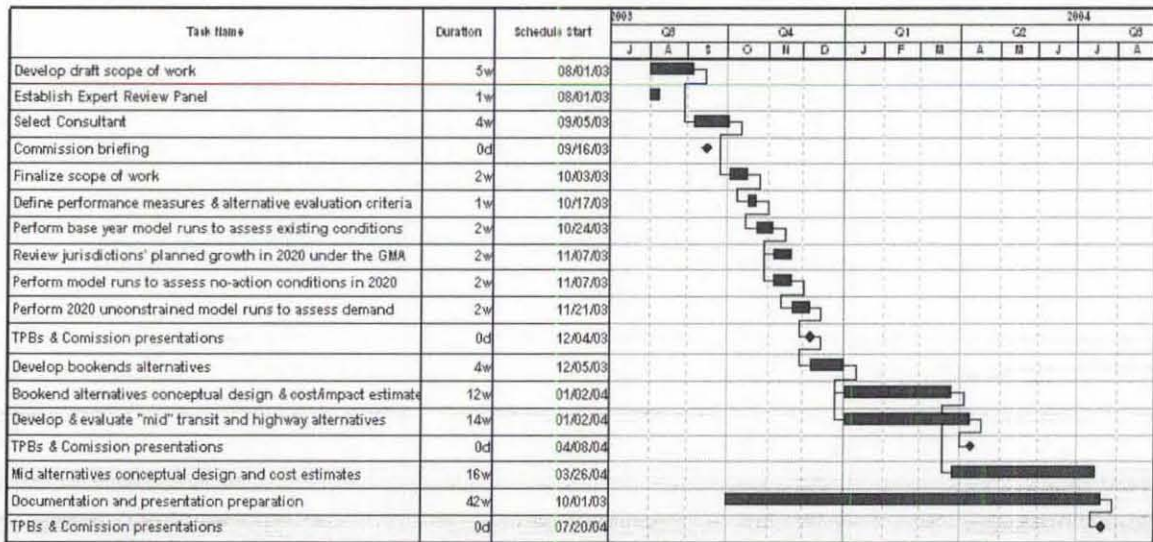
➤ Fourth (final) Commission and TPB presentations: analysis findings and conclusions.

Analysis Timeline

The analysis will be completed by July 2004. The anticipated schedule and major milestones of the analysis is shown on a Gant chart on next page.

September 17, 2003

Figure 6. Draft Congestion Analysis Schedule



DRAFT

Urban Areas Congestion Relief Analysis

September 18, 2003

The ESHB 1163 Requirement

ESHB 1163, or the appropriation bill, attached the following string to the Congestion Relief Analysis funding:

**“The study must include proposals to alleviate congestion consistent with population and land use expectations under the growth management act, and must include measurement of all modes of transportation”
(ESHB 1163 Sec. 222(3)).**

Purpose of The Analysis

- **Identify transportation improvement needs under the growth management plans in the three TMAs.**
- **Identify and evaluate potential multi modal solutions to meet the identified needs.**
- **Assess cost, impact and benefits of these potential multimodal solutions in meeting the anticipated travel demand.**

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Purpose Continued

- **This is not a plan development process. It is not intended to make improvement recommendations.**
- **It will focus on answering questions such as what does it take (in terms of relative cost and impact) to achieve a particular level/s of congestion relief?**

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The End Product

Existing system performance - baseline condition

The cost of doing no more than the funded projects by 2020

The price of meeting "unconstrained demand" in 2020

The max. transit/TDM/pricing effect on congestion relief

Various approaches to congestion relief:

With optimum TDM, transit, and pricing strategies in place, how much highway improvement is needed to achieve a particular level/s of congestion relief?

How much does it cost?

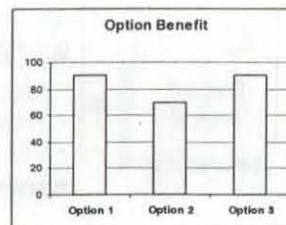
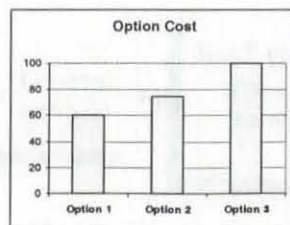
What impact will it have?

What benefits will it bring?

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The End Product Cont'd

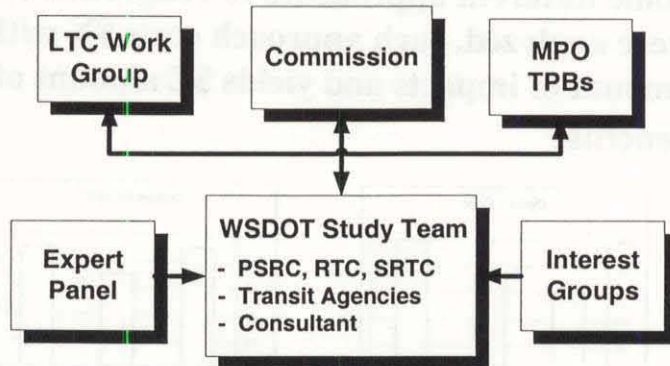
Some different approaches to congestion relief were analyzed, each approach costs \$X with Y amount of impacts and yields \$Z amount of benefits.



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Draft Approach

Study Structure

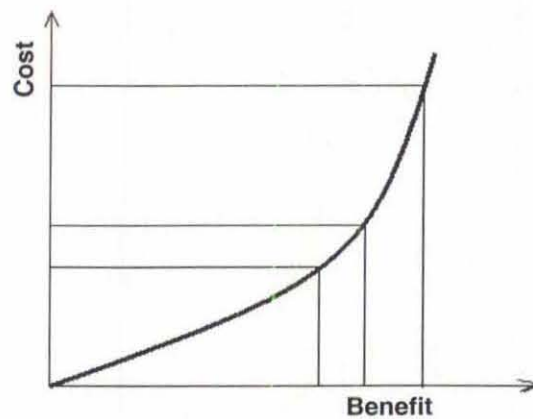


Critical Issues

- How should different modes be addressed?
- How to assess the cost and impact of alternatives?

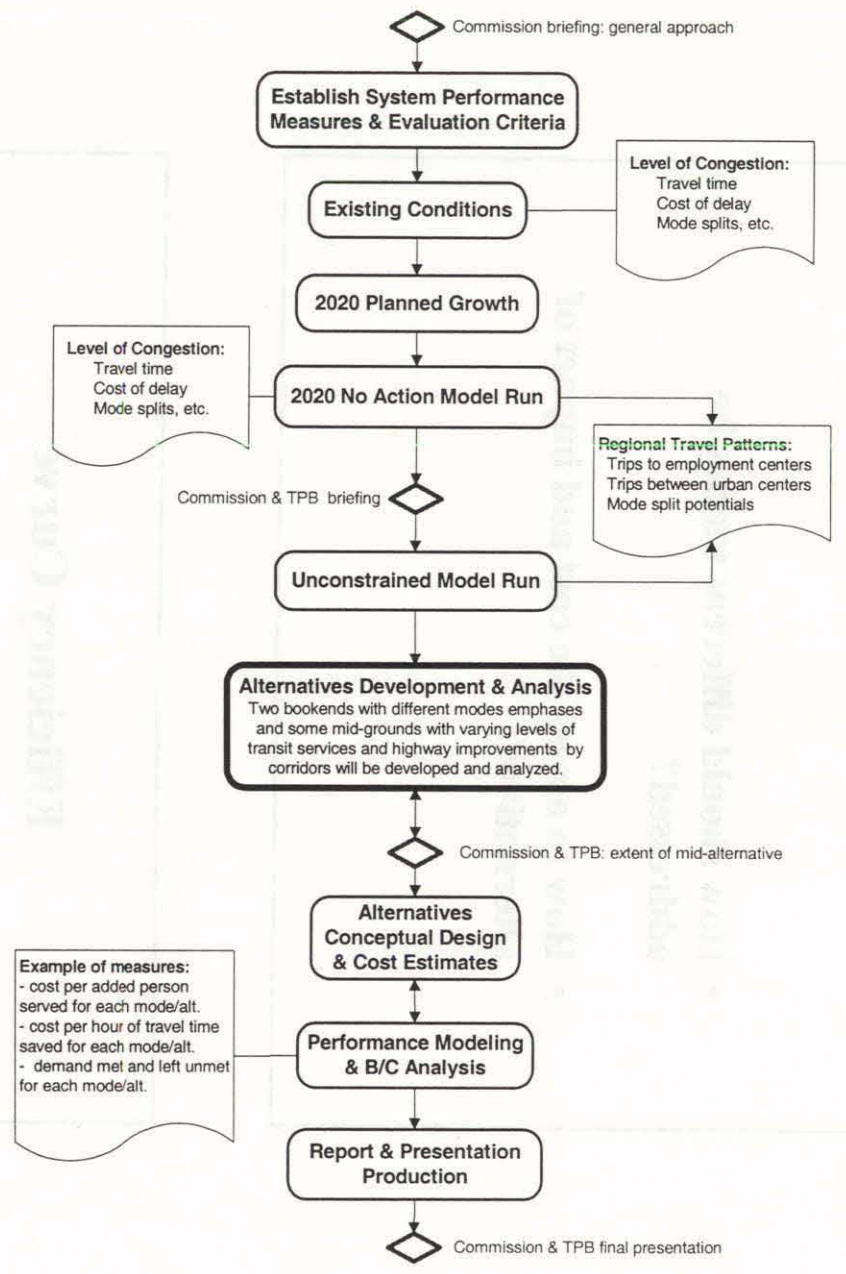
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Efficiency Curve

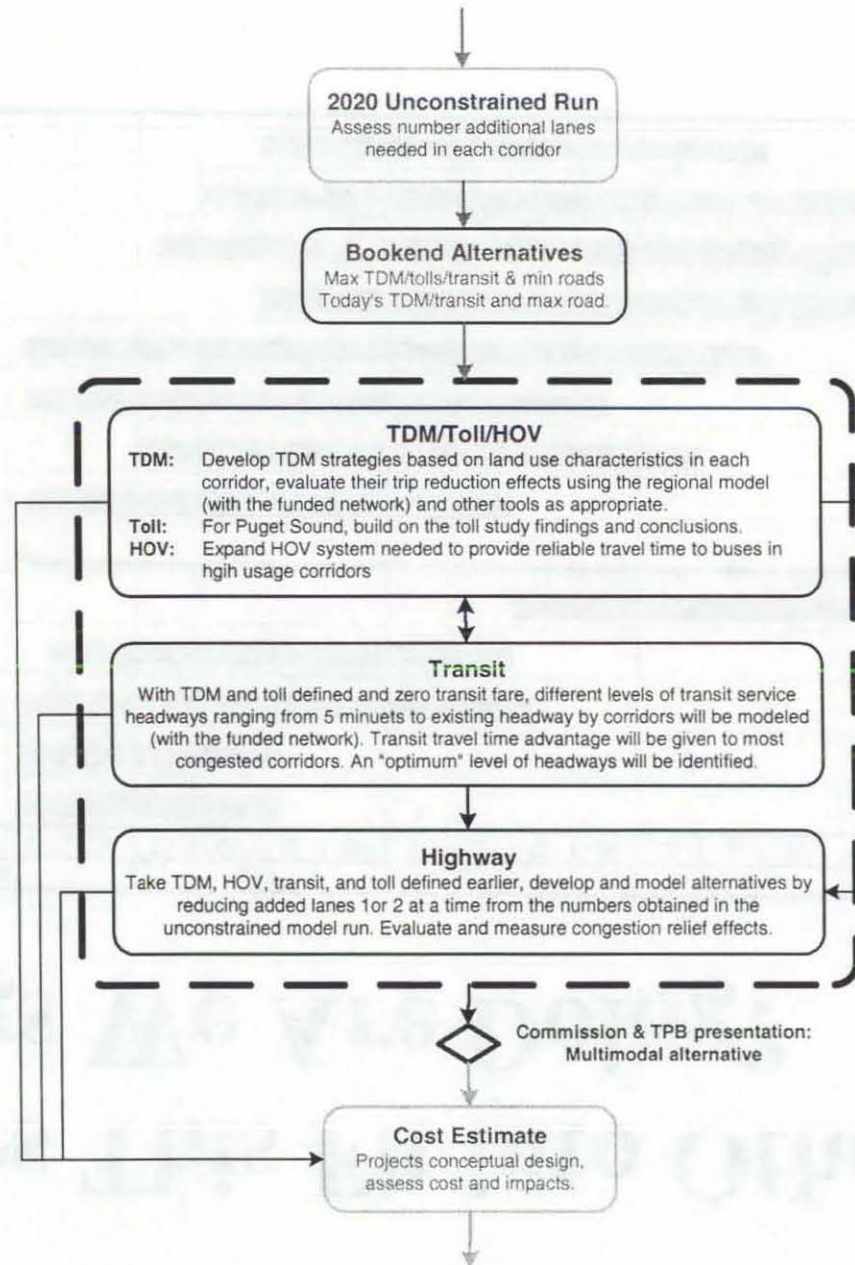


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Process



Modal Alternatives



How Does This Fit into Other Things We Are Doing?

Task Name	2003			2004				2005				2006				2007			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Congestion Relief Analysis		█	█	█	█														
RTID Prework		█	█	█	█														
Sound Transit Phase 2 Planning		█	█	█	█	█	█	█	█	█									
WTP Update		█	█	█	█	█	█	█	█	█									
PSRC MTP Update										█	█	█	█	█	█	█	█	█	█
Major Projects	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
SR509 PE - Shelit		█	█	█	█	█	█	█	█	█									
Alaska Way Viaduct DEIS - ROW				█	█	█	█	█	█	█	█	█	█	█	█				
I-405 PE - CN		█	█	█	█	█	█	█	█	█	█	█	█	█	█				
SR 520 DEIS - PE		█	█	█	█	█	█	█	█	█	█	█	█	█	█				
I-5 Congestion Relief through Seattle					█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
I-5, Vancouver/Portland Bridge Replacement DEIS				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
I-205 DEIS in Vancouver				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
I-90 Corridor Study in Spokane						█	█	█	█	█	█	█	█	█	█				

Next Steps

- **Recruit consultant**
- **Finalize scope of work**
- **Begin the analysis**
- **Come back in December for progress report**

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