Case Study: Decision-Making on I-405 and SR 167 Corridor Investments using SMIP™

Making Decisions from Traffic Models Workshop
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Sacramento, CA

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Investment Decision-Making on the I-405 and SR 167 Corridors

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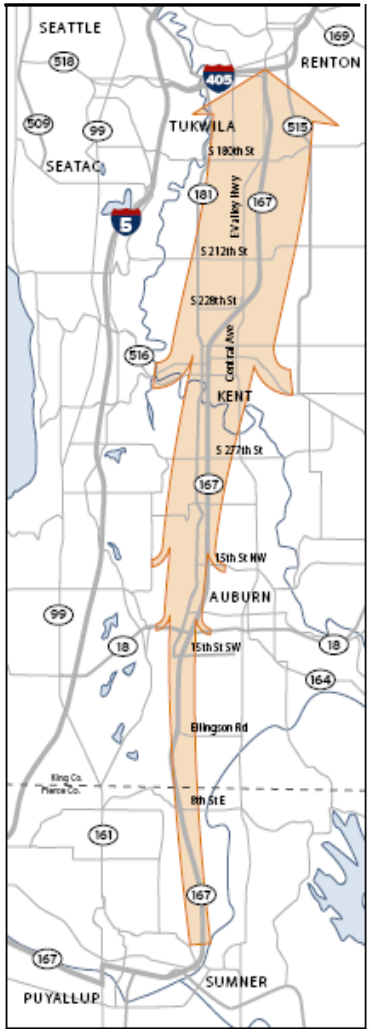
Investment Decision-Making on the I-405 and SR 167 Corridors



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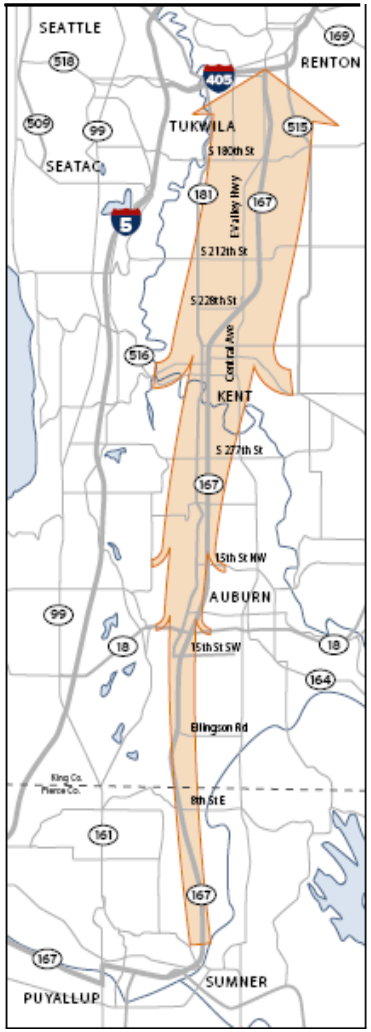
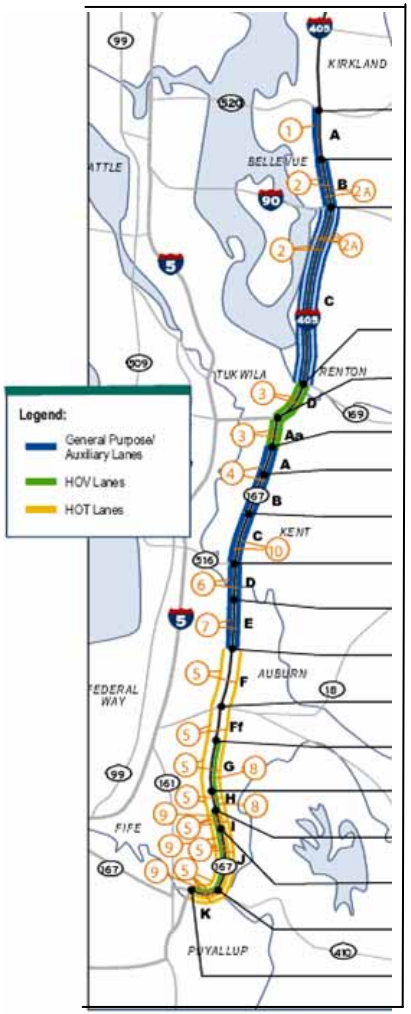
Investment Decision-Making on the I-405 and SR 167 Corridors





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I-405 and SR 167 Corridor Decision-Making Factors

- 13 public agencies involved
- 32.9 miles each direction to improve
- $10 billion in identified needs
- $2.13 billion in investment budget
- Current ADT in excess of 180,000
- 43 possible scenarios to consider

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I-405 and SR 167 Decision-Making Factors

- 13 public agencies involved
- 32.9 miles each direction to improve
- $10 billion in identified needs
- $2.13 billion in investment budget
- Current ADT in excess of 180,000
- 43 possible scenarios to consider
- 2 months to provide decision-making data and messaging

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What are the I-405 and SR 167 Investment Decisions to be Made?

The optimal prioritization and packaging of investments along the I-405 and SR 167 corridors.

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What are the I-405 and SR 167 Investment Decisions to be Made?

The optimal prioritization and packaging of investments along the I-405 and SR 167 corridors.

…*SMIP™ (System Mobility Investment Process) was able to achieve this objective.*

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Agenda for Workshop

- What is SMIP™?
- SMIP™ related to other models
- What information does SMIP™ produce?
- Case Study: I-405/SR 167 investment decision-making
- Summary

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What is SMIP™?

It is both a **Process** and a **Tool**

1. Identify the system
2. Identify decisions to be made
3. Gather/generate data
4. Conceptually model the system
5. Quantitatively model the system
6. Calculate performance of individual components
7. Calculate performance of system
8. Assign values to performance measures
9. Investigate what-if scenarios
10. Messaging to support decision making

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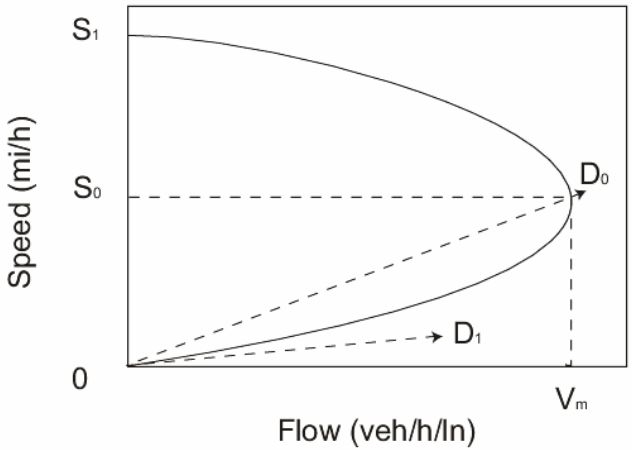
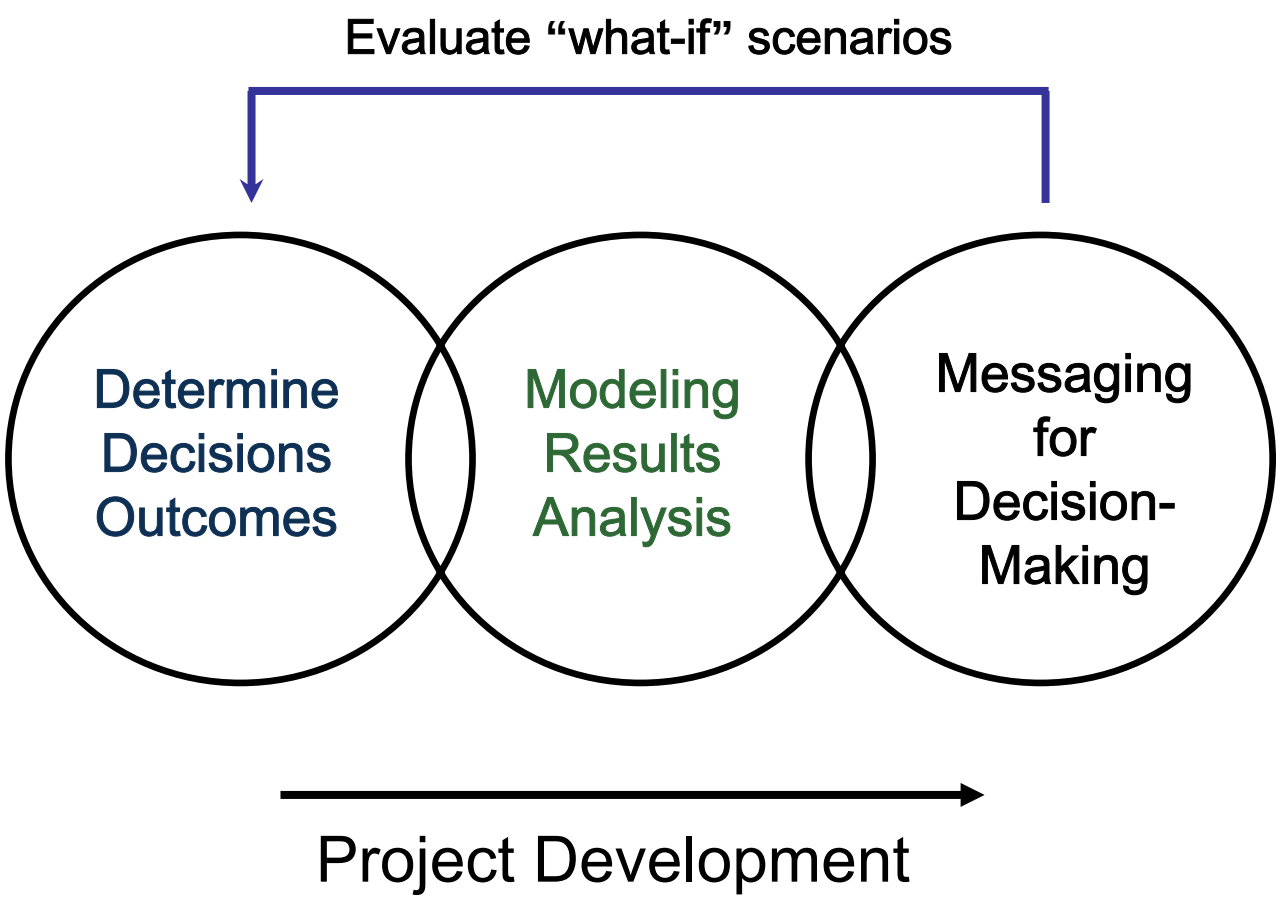
What is SMIP™?

Technical aspects of the **tool** include:

- –Founded on speed-flow relationships
- –Captures upstream and downstream impacts
- –24-hour performance measurement
- –Contains modules to analyze intersection, interchanges, and other system components



What is SMIP™?



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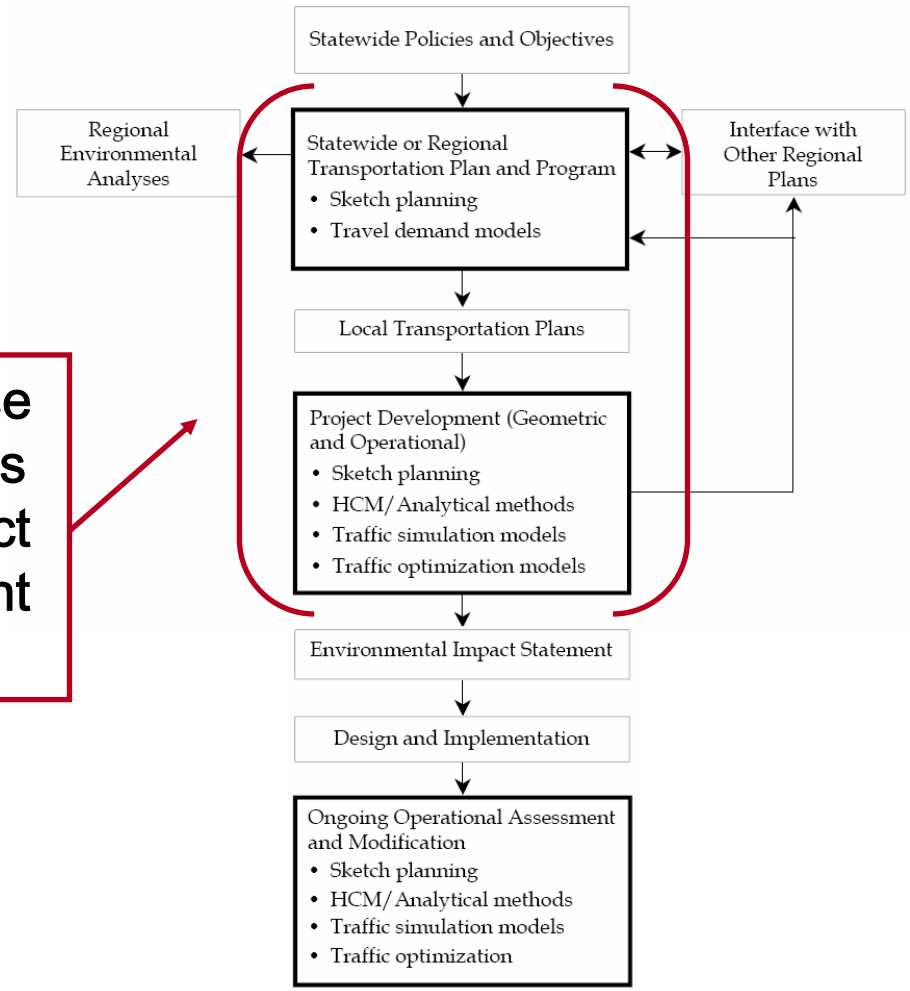
SMIP™ Related to Other Models



Intended use of SMIP™ is in the project development phase

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How does SMIP™ Differ?

- Covers project development phase analysis
- Connects segments of a system
- Scaleable
- Preserves individual integrity AND captures system interactions
- Can identify individual and system-wide benefits
- Addresses the bottleneck relocation issue
- Can readily run what-if investment scenarios
- Produces clear messages
- Goes beyond analysis, providing the information needed for informed, defendable decision-making.

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What Information does SMIP™ Produce?

Investment Benefits based on Performance Data:

- –Speeds
- –V/C Ratios
- –Hours of congestion
- –Daily hours of vehicle and person delay

Messaging Based on Performance Data:

- –Average speed maps
- –LOS diagrams
- –“Brainscans” showing congestion
- –Bar charts showing delay reductions
- –B/C Ratios
- –Measures to minimize construction impacts

Case Study: I-405 and SR 167 Investment Decision-Making

Corridor issues to be addressed:

- Bottleneck relief, without bottleneck relocation
- Need to quantify localized and system-wide investment benefits
- Determine the optimal combination of investments
- Operational policies for GP, HOV, and HOT Lanes
- Making only directional investments
- Ongoing reprioritization of programmed investment package
- Construction sequencing
- Construction impacts

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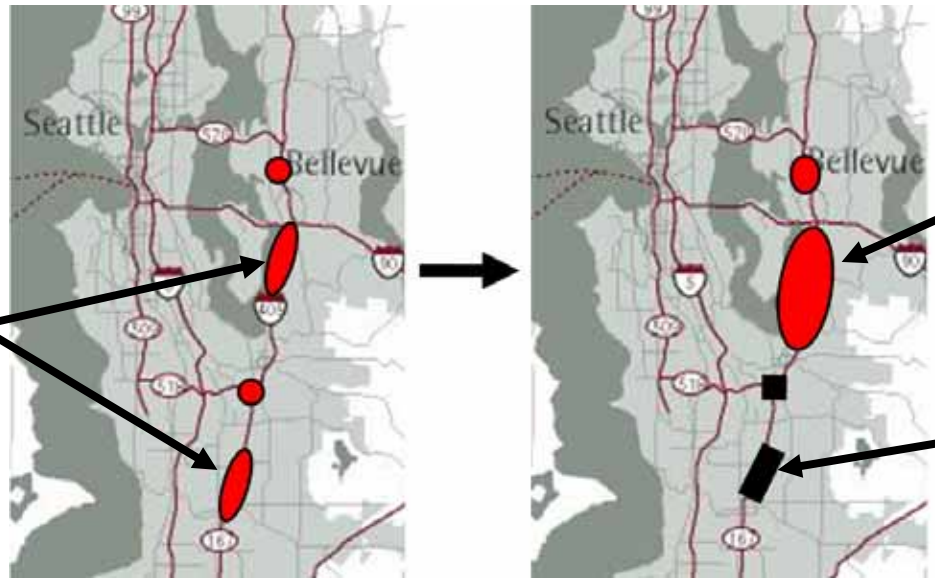
Bottleneck Relief Without Relocation



Bottleneck

Bottleneck Relocation

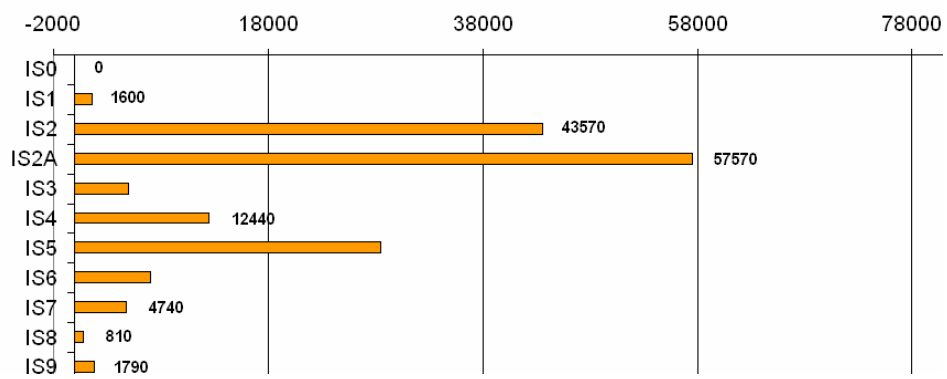
Bottleneck Relief

Before Investment

After Investment

Need to Quantify Localized and System-Wide Investment Benefits

Localized Delay Reduction



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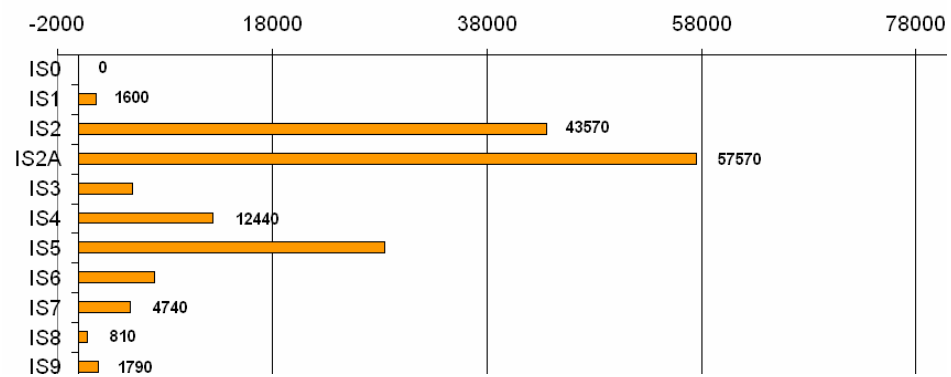
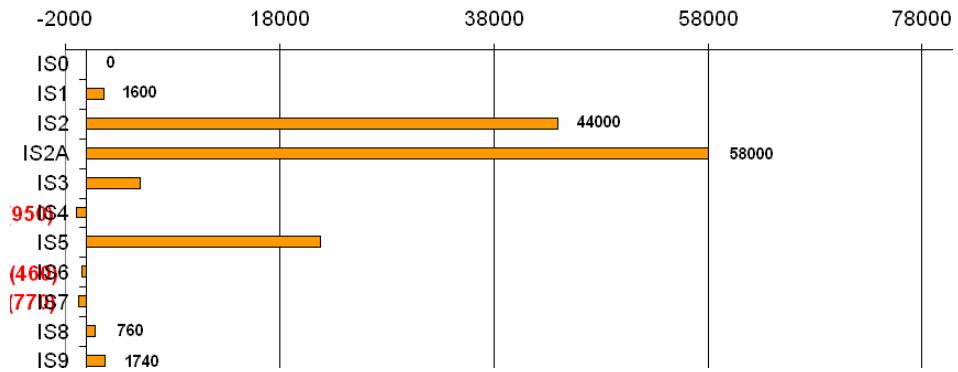
Need to Quantify Localized and System-Wide Investment Benefits

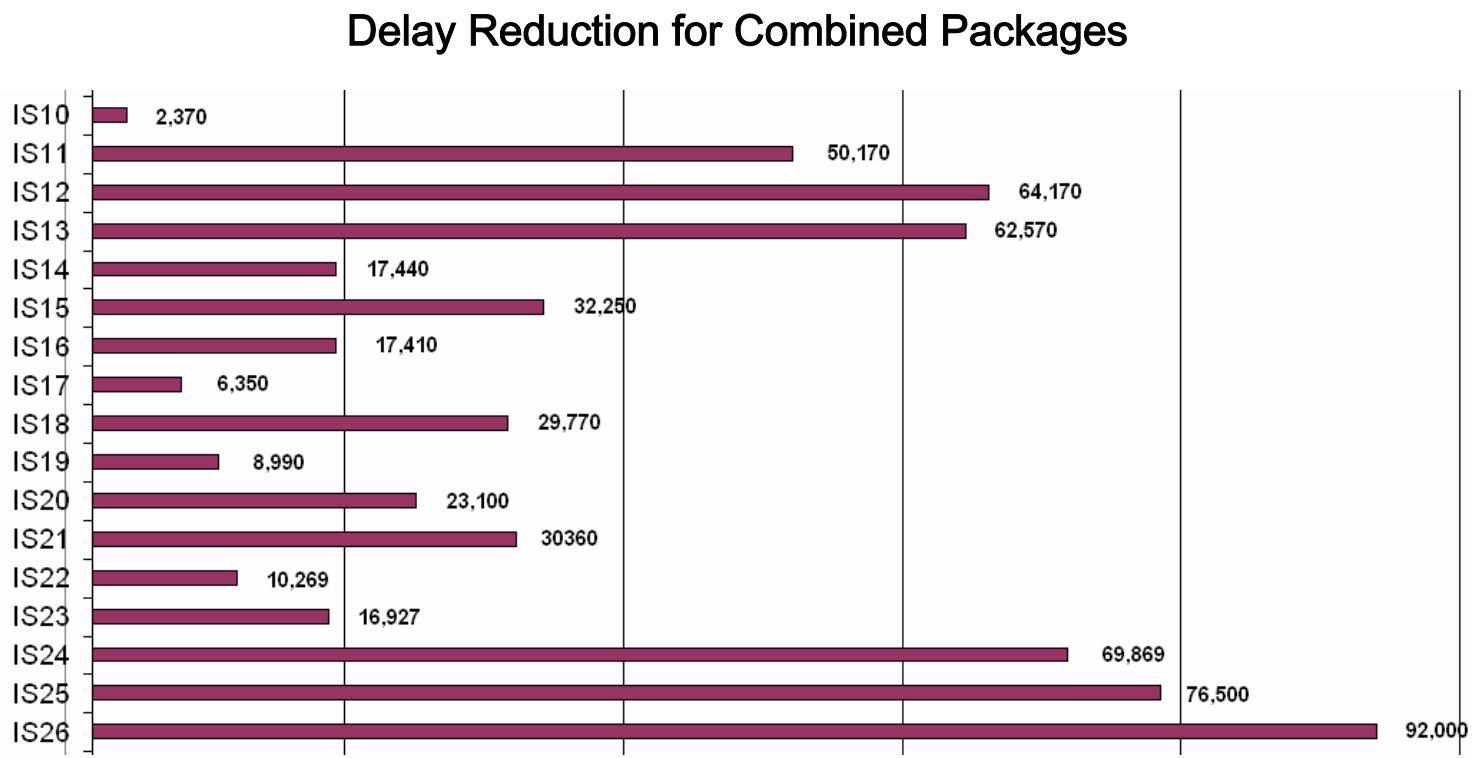
Localized Delay Reduction



System Delay Reduction



Determining the Optimal Combination of Investments



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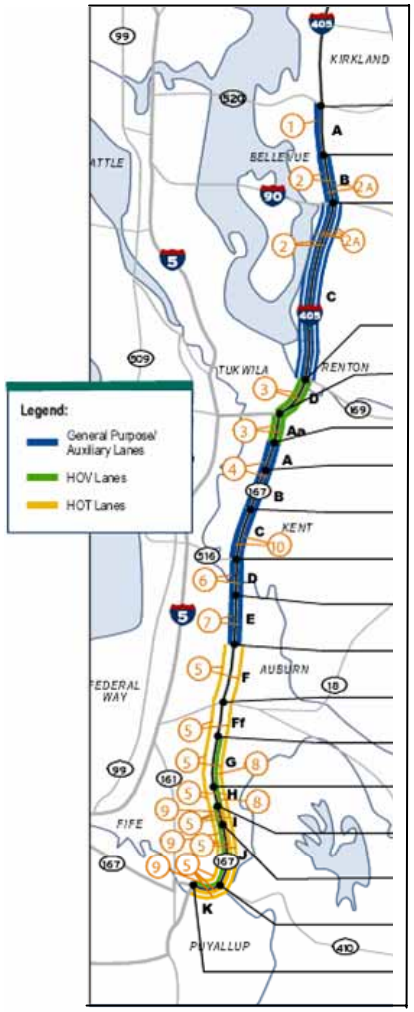
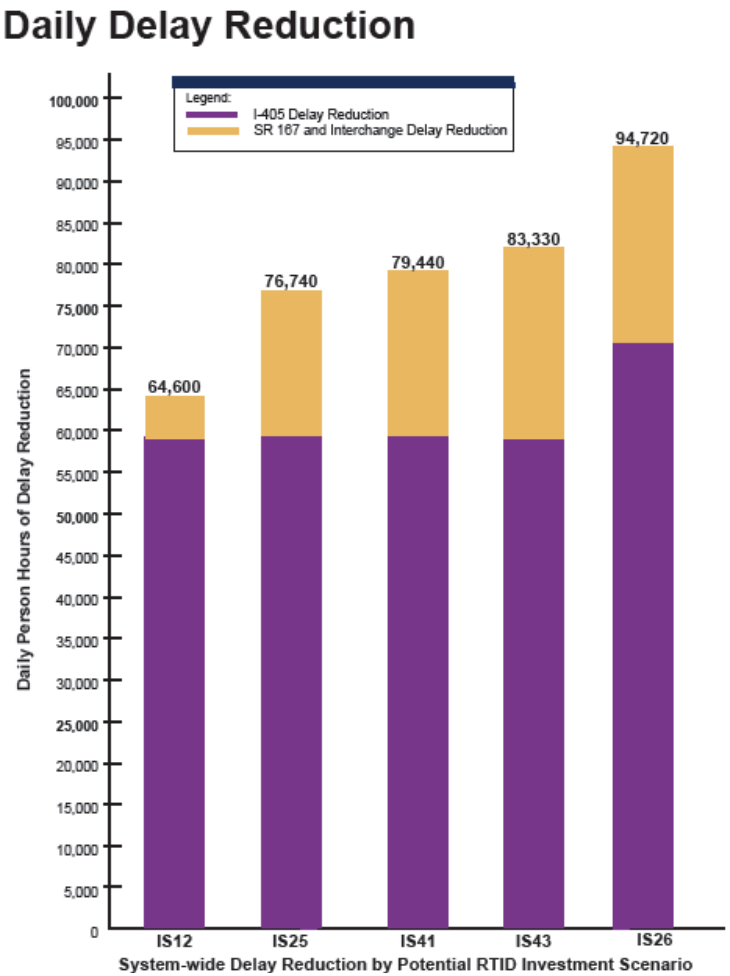
Operational Policies for GP, HOV, and HOT Lanes





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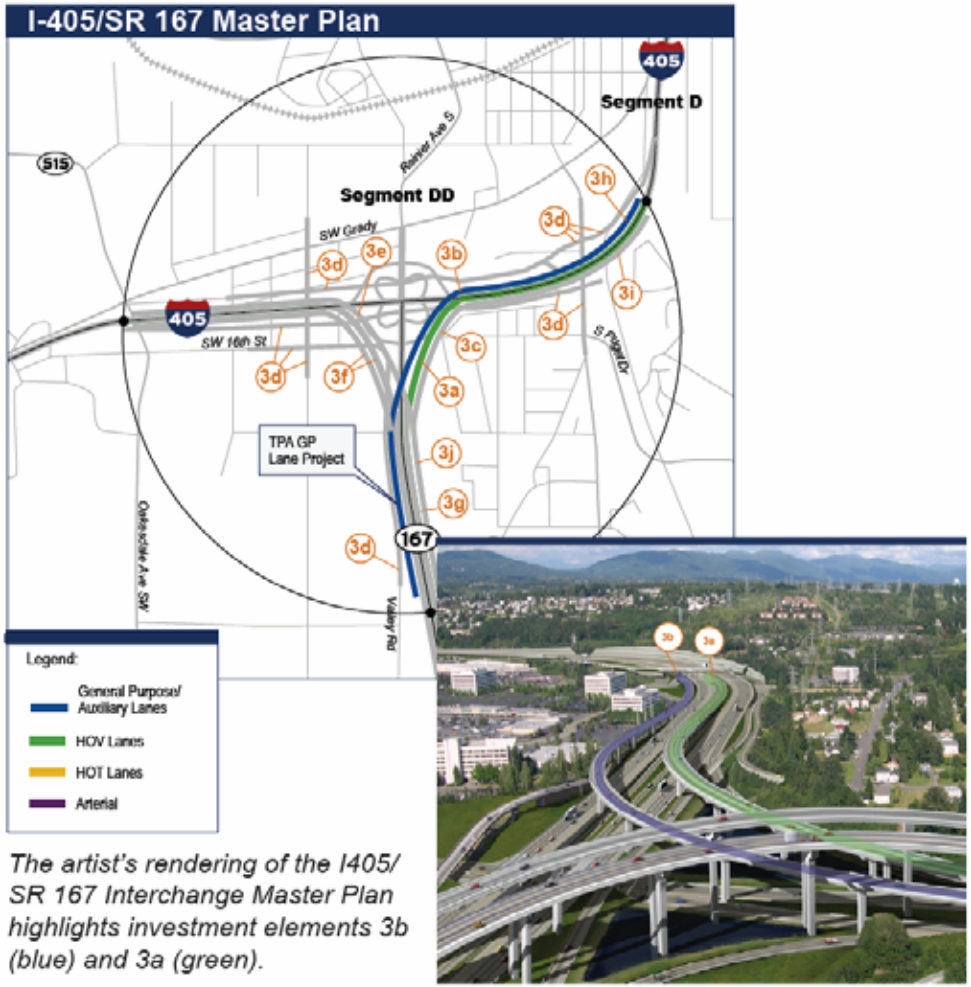
Making Only Direction Investments



The artist's rendering of the I405/ SR 167 Interchange Master Plan highlights investment elements 3b (blue) and 3a (green).

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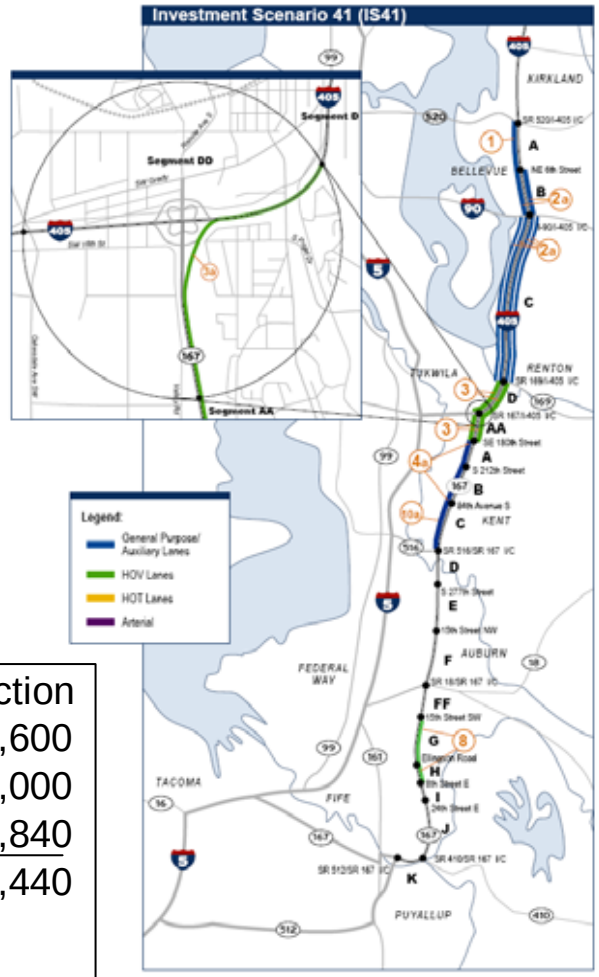
I-405 and SR 167 Investment Decision-Making Outcome



Benefits Based on Performance Data:

	Cost (Billions)		Delay Reduction
I-405 Corridor	$	1.405	59,600
I-405/SR 167 Interchange	$	0.320	5,000
SR 167 Corridor	$	0.399	14,840
	$	2.124	79,440
Corridor Delay Reduction			45%

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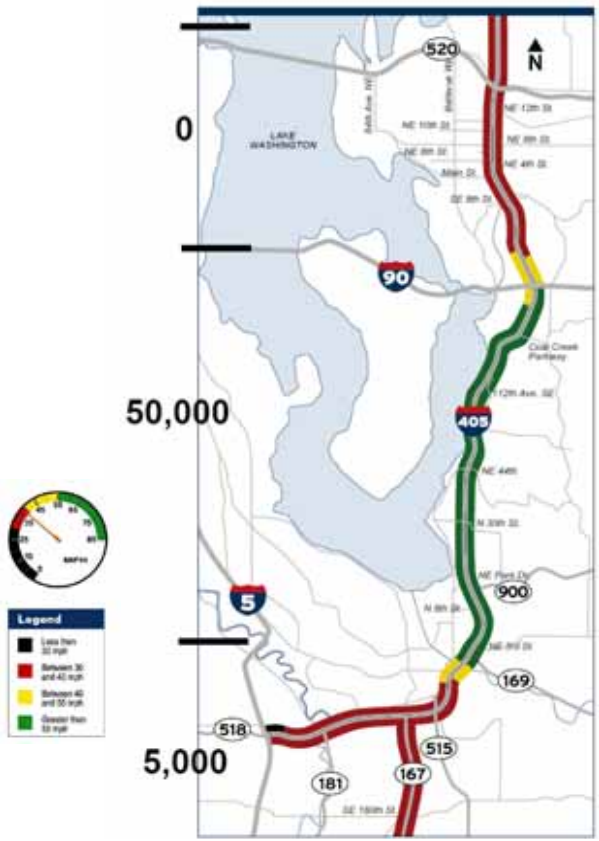
I-405 and SR 167 Investment Decision-Making Outcome

Messaging Based on Performance Data:

- Delay reduction
- Speed of travel
- Degradation of system over time

2014 No Build

2014 Build



Summary

The SMIP™ methodology can effectively support investment decision-making that will:

- Manage congestion impacts related to construction projects
- Coordinate operational, planning, and communication [messaging] issues
- Document benefits for congestion management applications
- Have regional mobility applications
- Establish project/program delivery commitments and mange traffic operational impacts

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- Manage congestion impacts related to construction projects
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- Document benefits for congestion management applications
- Have regional mobility applications
- Establish project/program delivery commitments and mange traffic operational impacts

…all of which were the goals of this workshop.

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Questions & Answers

For more information about SMIP™ or a copy of this presentation, contact:

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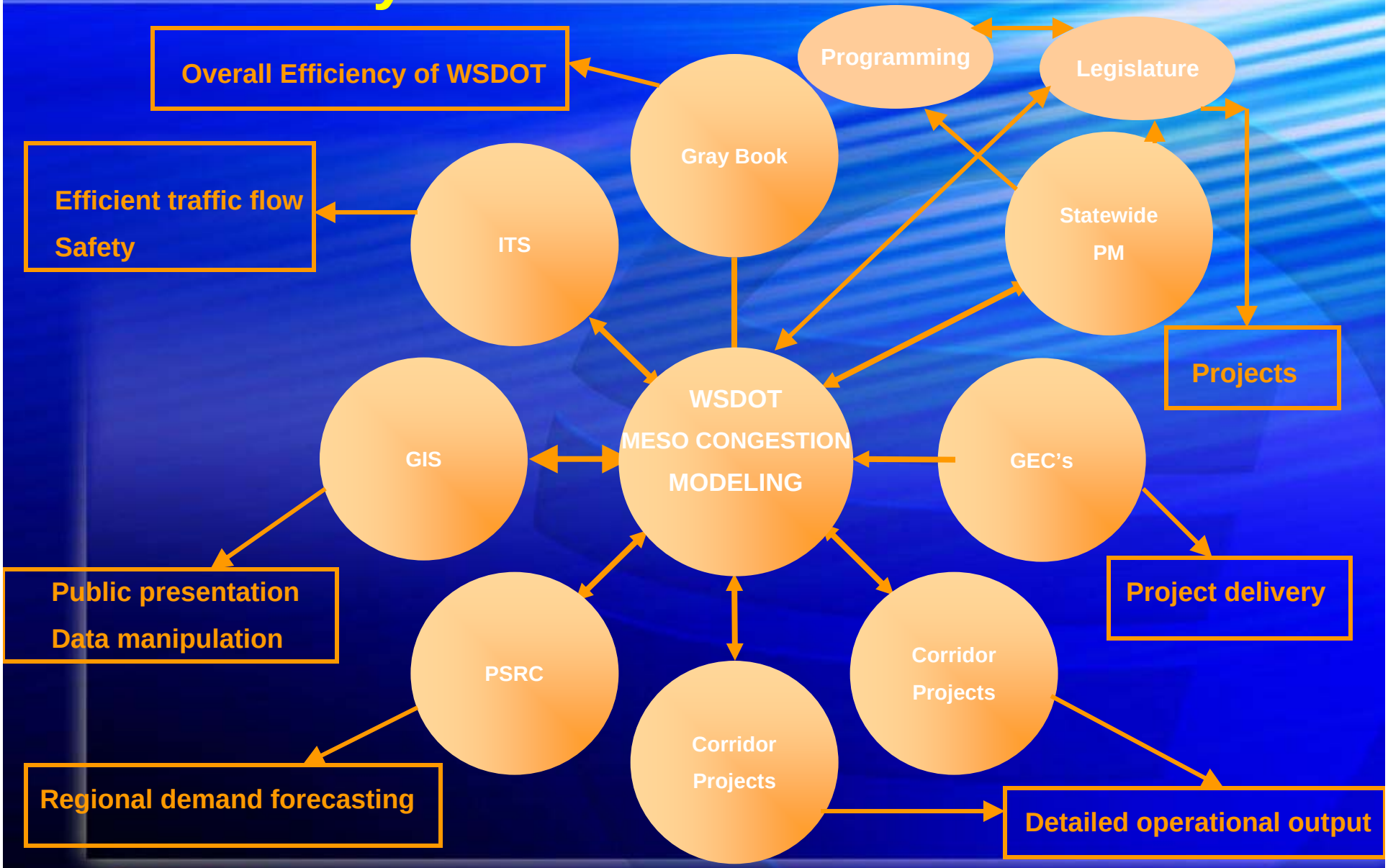
A Comprehensive Approach to Programming, Managing and Delivering Construction Projects in Puget Sound Region

Mithilesh Jha
Earth Tech

EarthTech
A Tyco International Ltd. Company

A BETTER TOMORROW made possible

WSDOT Systems



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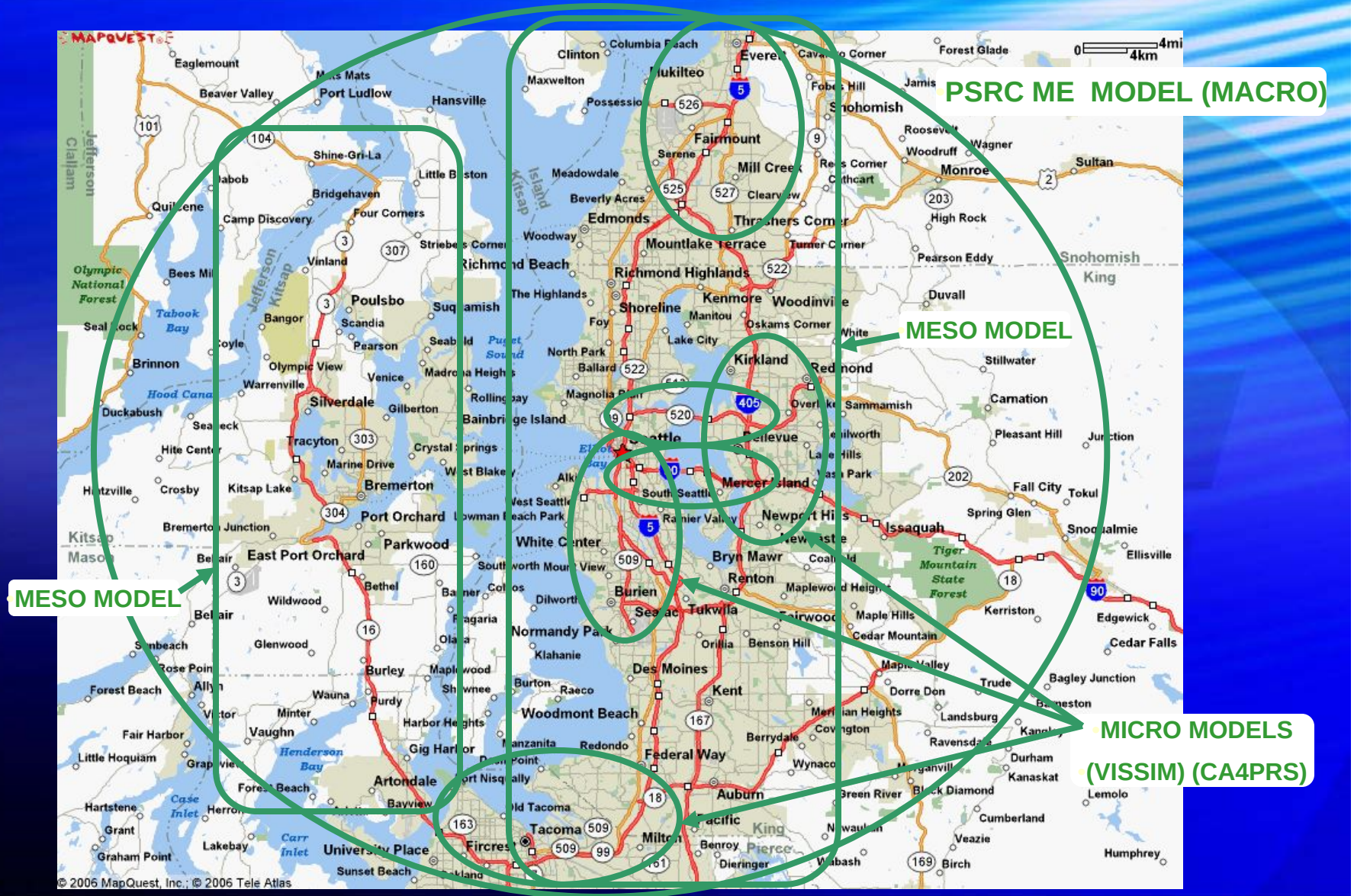
A BETTER TOMORROW made possible

WHY Large Traffic Model

Issues

- Technical
- Institutional
- Financial
- Maintenance

Traffic Modeling: Phased development