Modeling Managed Lanes

An Initial Discussion

presented to
MTF Model Advancement Committee

presented by
Rosella Picado, Parsons Brinckerhoff

March 7, 2012
Objectives

- Develop managed lane forecasting tools for use by MPOs and Districts in corridor and multi-modal planning studies

- Compatible with FSUTMS as it evolves

- Complement travel forecasting activities of Turnpike and other Express Toll Authorities – planning, design, investment
Conceptual Requirements

- Flexible – Able to accommodate most or all “flavors” of managed lanes within a unified approach

- Behaviorally Sensitive – Includes variables that are important to selection and use of a managed lane

- Policy Sensitive – Has the ability to test different Managed Lane Policies (e.g., tolls, hours of operation, eligibility)

- Ease of use – Model implementation compatible with FSUTMS and a reasonable runtime

- Understandable – No “black boxes”
Managed Lane “Flavors”

- HOV - only
- Express Lanes
- Truck Only
- Reversible lanes
- HOT – SOV pay
- Dynamic Tolling
- Open Road Tolling
- Dedicated Facilities
- Pre-pay and/or Pay per use (toll booths)
- ITS Solutions (Traffic calming, speed advisories, incident management)
Behavioral Variables

- Time savings
- Cost
- Trip characteristics (purpose, party size, etc.)
- Employment type (on-time requirements)
- Income/Value of time
- Time of day
- Person and household characteristics
- Situational effects
Managed Lane Policy Dimensions

- Eligibility – HOVs free? Truck Use?

- Toll schedule – Fixed or variable, dynamic or pre-set, max/min constraints, credits, re-investment?

- The end of toll booths?

- Objective: Maximize revenue or Maintain level of service?
Data Requirements

- Willingness to Pay – Measures of value of time, stratifications by income, trip purpose, household characteristics, and others

- Stated Preference and/or Revealed Preference Surveys
Implementation Platform

- Route Choice / Static Assignment
- Mode Choice
- Activity-Based Models
- Dynamic Traffic Assignment

How does this meet the “ease of use” criteria?

At what level is it compatible with FSUTMS?
## Managed Lane Modeling Development

<table>
<thead>
<tr>
<th></th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Route choice</td>
<td>Mode &amp; route choice</td>
<td>Mode &amp; route choice (with second order effects)</td>
</tr>
<tr>
<td><strong>Model Type</strong></td>
<td>Trip-based, static assignment</td>
<td>Trip-based, static assignment</td>
<td>Activity-based &amp; static assignment, and/or DTA</td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td>Dynamic toll estimation, willingness to pay curve, toll policy</td>
<td>Feedback of toll LOS skims to mode choice, sensitive to multi-modal shifts</td>
<td>Detailed household and person attributes for toll choice</td>
</tr>
<tr>
<td><strong>Uses</strong></td>
<td>LRTP &amp; corridor planning</td>
<td>Multi-modal corridor evaluation</td>
<td>Policy sensitivity testing</td>
</tr>
<tr>
<td><strong>Data Requirements</strong></td>
<td>SP/RP survey for WTP curve or logit estimation</td>
<td>SP+RP survey for mode choice estimation</td>
<td>SP+RP survey for mode choice estimation</td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td>Summer, 2012</td>
<td>2013</td>
<td>2014-2015</td>
</tr>
</tbody>
</table>
Questions and Discussion