# Modeling Managed Lanes

## Project Progress Update

Presented to
Advanced Traffic Assignment Sub-Committee

Presented by
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## Managed Lane Modeling Development

<table>
<thead>
<tr>
<th>Phase</th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Assignment-Based</td>
<td>Mode Choice + Assignment</td>
<td>Discrete Choice</td>
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<tr>
<td>Model Type</td>
<td>Trip-Based, Static</td>
<td>Trip-Based, Static</td>
<td>AB and/or DTA</td>
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<tr>
<td>Features</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>Incorporates detailed HHLD characteristics for toll choice</td>
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<tr>
<td>Uses</td>
<td>LRTP &amp; Corridor Planning</td>
<td>Multi-modal corridor evaluation</td>
<td>Policy Sensitivity Testing, and TP Planning</td>
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<tr>
<td>Data Requirements</td>
<td>SP/RP survey for WTP curve or logit estimation</td>
<td>SP+RP survey to estimation and calibrate MC logit</td>
<td>HIS supportive of AB models</td>
</tr>
</tbody>
</table>
Phase I Review

- Assignment-Based Dynamic Toll Assignment
- Final Report Produced: “Managed Lane Modeling Application for FSUTMS: Phase 1” October 2012
- Report responds to comments from the ATA committee.
- Model script is operational, tested and available for application

Phase I Review -- Implementation

- Successfully applied for Tampa-Area dynamic tolling demand estimation
- SP toll survey planned for JAX-Tampa corridor will supply additional willingness to pay data to support model estimation
- Implementation assistance is available, and a managed lane modeling webinar is scheduled for April 19, 2013
- Committee/MTF endorsement requested
**Time of Day Implications**

- All Managed Lane Model Applications work best with time of Day stratification – allowing for dynamic toll estimation
- For Phase I, Hourly Demand is most desirable
- For Phase II, the mode choice model works best with 2-4 period stratifications
- Our TOD model development has developed a fixed and demand-responsive TOD models. For Phase III, the activity scheduler will serve as a framework for dynamic toll modeling, as well as provide period-specific parameters

**Update on WTP Curve Derivation**

- A key input to the model is a willingness to pay (WTP) curve
- WTP relates the market share willing to pay a toll with the marginal cost per time saved
- As a part of a joint CO Systems Analysis/Turnpike effort, both SP and RP surveys will be collected
- Observed WTP curves will be developed from this data
Phase II Managed Lane Modeling -- Status

- Phase II began this summer
- Phase II is focused on
  - Toll Choice implementation within Mode Choice
  - Integration with Phase I assignment-choice application

Phase II Work to Date

- Mode choice application implemented in XCHOICE command
- XCHOICE application tested
- Test Case Network developed for Toll and HOV applications – Olympus Model base
- Develop Skim Scripts supporting HOV/Toll combinations
- Test MC application
- Develop feedback integration with Assignment
- Test feedback application
Utility Equations

- Use of a time-savings screen
- Separate terms for time savings – Toll VOT coefficient
- Separate term for toll values
- Constants for HOV and TOLL “modes”
- Suggested ranges of coefficients and constants
- Consistency with WTP curves used in assignment
Prototype Network

Next Steps

• Integrate Phase I dynamic assignment with mode choice feedback
• Test final configuration and develop general ranges for key constants and parameters
• Documentation