WRTM and Active Transportation and Demand Management

Weather Responsive Traffic Management Workshop
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Office of Operations – Transportation Management
Discussion Items

- Overview and examples of ATDM
- Examples of ATDM during weather
- National ATDM program initiatives and opportunities for support to weather initiatives
What and Why ATDM

Active Transportation and Demand Management is an integrated approach to dynamically managing travel demand and traffic demand and available capacity of transportation facilities.
Much Overlap in Between ATDM and WRTM Tools

WRTM involves providing advisory, control, and treatment in direct response to, or in anticipation of developing roadway and visibility issues.

ATDM is the dynamic management, control, and influence of travel demand, traffic demand, and traffic flow of transportation facilities and involves providing advisory, incentives, pricing, enforcement, control.
**V/C Ratio – Putting ATDM in Traffic Engineering Terms**

<table>
<thead>
<tr>
<th>Predict and Provide</th>
<th>Actively Manage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>V</strong> – predict demand</td>
<td><strong>V</strong> – influence demand</td>
</tr>
<tr>
<td><strong>C</strong> – provide capacity</td>
<td><strong>C</strong> – maximize efficiency</td>
</tr>
</tbody>
</table>

Assumes travel volume constant and adjusting capacity

Acknowledges available road capacity and demand and as variable.
Demand

Travel Demand  Traffic Demand  Facility Demand

Destination choice  Time of day choice  Mode choice  Route Choice  Lane / facility use
Example ATDM Approaches

- Dynamic ridesharing
- Congestion Pricing
- Dynamic access control
- Queue warning
- Managed lane access
- Ramp access

- Dynamic truck restrictions
- Speed harmonization
- Dynamic shoulder use
- Junction control
- Ramp metering
Example ATDM Approaches
Some Weather-oriented ATDM Examples

- **Use of ATM system**
  - Extra CCTV, VMS, ramp backups with yellow caution, close with red X
- **Weather driven VSL**
  - MN, NM, ID, ME, WY
- **Active warning (snow, pavement, fog)**
  - FL, UT, NC, ID
- **WSDOT Smart Chain Up Area (I-90 over Mountain Pass)**
- **Smart Phone Apps with incentives**

- **Vehicle restrictions**
  - MT (I-90 high winds)
- **Reversible /contra flow**
- **Access control**
  - Swing gates MN, WY
- **Adaptive signal control**
- **Pre-trip and predicted road condition info.**
- **CLARUS Multi-state demonstration program**
  - Predicting travel conditions 12 hours in advance
Some Weather-oriented ATDM Examples
WSDOT Smart Chain Up Concept
FHWA ATDM Program

Research

Tool Development And Guidance

Outreach and Training
FHWA Projects Underway

- Operational Concept /framework development
- ATDM AMS Methodology & Test bed
- VSL Field Operational Test
- Traffic Control Device evaluation
- Shoulder use safety analysis

- Deployment evaluations
- Guidance documents
- Informational Briefs
- KTT / Workshops
- Peer-to-Peer support
- Analysis and Decision Support
  - ATDM Analysis Guide
ATDM Analysis Guide

- Weather
  - Rain, snow, cold, wind, fog

- Incidents
  - Collisions, breakdowns, debris, distractions

- Work Zones
  - Lane closures, activity, distractions
## Weather Events

<table>
<thead>
<tr>
<th>Condition</th>
<th>Intensity</th>
<th>Probability</th>
<th>Capacity Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rain</td>
<td>0.10&lt; R &lt; 0.25 in/hr</td>
<td>19.7%</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>R &gt; 0.25 in/hr</td>
<td>0.0%</td>
<td>14%</td>
</tr>
<tr>
<td>Snow</td>
<td>0.05&lt;S&lt;0.50 in/hr</td>
<td>0.0%</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>S &gt; 0.50 in/hr</td>
<td>0.0%</td>
<td>22%</td>
</tr>
<tr>
<td>Cold</td>
<td>&lt; -4° F</td>
<td>0.0%</td>
<td>8%</td>
</tr>
<tr>
<td>Visibility</td>
<td>&lt; 1.00 miles</td>
<td>7.4%</td>
<td>10%</td>
</tr>
<tr>
<td>Clear</td>
<td></td>
<td>80.3%</td>
<td>n/a</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100.0%</td>
<td>Average Bad Weather 7.8%</td>
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Opportunities for Engagement of WRTM Community

- Involvement in ATDM KTT Efforts
- Seek other opportunities to test ATDM for weather
- Influence ATDM guidance and research (e.g. weather responsive scenarios for COO and AMS)
- Integrate Research
  - Connected vehicles, ICM, CLARUS
- WRTM needs in planning and designing for operations
- Others?