Predictive Modeling for Operations

MODSIM World Transportation Panel 9/27/12
Operational Decision Support

- **Traffic Operations**
  - Traffic management
  - Traveler information
  - Decisions made rapidly even when information is incomplete

- **Traditional Approach**
  - Based on current, observed conditions
  - Relies on individual operator expertise
  - Little opportunity for decision analysis prior to execution

- **With Predictive Modeling**
  - Based on future conditions
  - Allows quantitative assessment of response
  - Allows for iterative refinement of response
Approach

- Construct a traffic model for the area of interest
Approach

- Measure real time traffic volume, occupancy and speed
Approach

- Constantly calibrate model with real time observations
- Simulation is always in synch with current reality
Approach

- A crash or incident occurs
- Input crash parameters to the model
- Project impacts into the future

React to the future rather than the past
Partners

Leader in Traffic Operations Software
- Freeway Management
- Traveler information systems

Leader in Traffic Modeling and Simulation
- Building worlds largest traffic model
- Mobile applications for traveler guidance
Operational Scenario

- Crash occurs
- Operator prepares response plan (DMS posting, HAR messaging, detours)
- Operator evaluates and refines response plan using predictive model
- Operator publishes traveler information alerts based on predictive results rather than current conditions
OpenTMS

Incident Location: Corniche at 2nd St (East) @ MM 2.1  Type:  Category: Traffic

Incident Response  Corniche at 2nd St (East) @ MM 2.1  Suspect

Filter:
Downtown

Active Signs:
Online Signs:

Directions:
E  S  u  W  N

Roads:
- SR 3014
- I-81
- PA 201
- RT 6570
- I-78
- SR 22
- I-376
- SR 322
- SR 70
- I-80
- I-79
- US 30
- SR 56
- SR 3070
- I-91
- PA 276
- PA 23
- US 1
- US 202
- I-99

<table>
<thead>
<tr>
<th>Status</th>
<th>Name</th>
<th>Road</th>
<th>Dir</th>
<th>MM</th>
<th>Currently Displaying</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Downtown 30th</td>
<td>30th St</td>
<td>E</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Downtown 8th</td>
<td>8th St</td>
<td>E</td>
<td>0</td>
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</tbody>
</table>

Associate Signs  Cancel

Activate Response  Associate New Sign  Remove Selected Sign
Incident Location: Corniche at 2nd St (East) @ MM 2.1
Type: Category: Traffic

<table>
<thead>
<tr>
<th>Incident Response</th>
<th>Corniche at 2nd St (East) @ MM 2.1</th>
<th>Suspect</th>
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</thead>
<tbody>
<tr>
<td>Generate Response</td>
<td>Sign (2)</td>
<td>Active Response</td>
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</table>

- **Sign (2)**

- **Camera**

- **Notification**

- **HAR**

- **Detour Routes**

**Recommended / Pending Response**

- Downtown 30th: 30th St (East) @ MM 0
  - Crash at Corniche and 2nd

- Downtown 8th: 8th St (East) @ MM 0
  - Crash at Corniche and 2nd
Evaluate Proposed Response

- Key Performance Indicators
- Queue and congestions predictions
  - 0 Minute (current)
  - 10 Minute
  - 20 Minute
  - 30 Minute
Questions?

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