Managing Freight Mobility During Construction

Randal Thomas
Statewide Traffic Mobility Manager
Oregon’s Statewide Traffic Mobility Program

Presentation Topics

- Oregon Transportation Investment Acts (OTIA)
- Goals of Statewide Traffic Mobility Program
- Focus of ODOT’s Mobility Approaches
- Results to Date
- Questions

Randal Thomas
Statewide Traffic Mobility Manager
Oregon Transportation Investment Act (OTIA) Program Background

- Economic and Bridge Options Report
  - Hundreds of aging bridges would limit freight mobility on state and local systems

- Outlines economic threats of inaction
  - Weight limits on Oregon’s older bridges would limit freight mobility

- Recommends corridor-based solution
  - Repair/replace more than 300 state highway bridges — $1.3 billion
  - Major freight routes statewide
Oregon Transportation Investment Act (OTIA) Program Background

- Freight mobility, job creation, and program expenditures are linked to economic recovery of the state
- Largest investment in state’s highway infrastructure in 50 years
OTIA Program Background

- Oregon lawmakers pass comprehensive, 10-year, $3 billion transportation improvement bills
OTIA Bridges in the Program

OTIA III State Bridge Delivery Program

OTIA III Bridges

Oregon Department of Transportation
Our challenge: Keep Oregon moving during a period of unprecedented construction

- Statewide Transportation Improvement Program – STIP
  - Stimulus Projects
  - Maintenance Work
  - City & County Projects
  - Rail Projects
  - Major Planned Utility Projects
“It will be your job to create major delays.”
Goal of Mobility

Minimize disruptions to motorists, the freight industry and communities without compromising public or worker safety, or the quality of work being performed.

“Keep Traffic Moving During Construction”
Focus of Freight Mobility Effort

- Oversize/Overweight Restrictions
- Lane/Capacity Restrictions
- Diversions/Detours
- Access
Oversize / Overweight Restrictions

- From ODOT’s Motor Carrier Division (MCTD)
- Key Corridors and other routes have established restrictions
- Project teams need to collaborate with freight industry stakeholders through MCTD if modifications are needed

Ensure that over the life of the program heavy, overwidth, and overheight freight can move unimpeded throughout the state.
Mobility requirements for maintaining freight routes

- Commercial vehicle restrictions require 28-day notice to ODOT Motor Carrier Division (MCTD) to allow for 21-day notice to trucking industry.

- N/S and E/W freight routes accommodate:
  - Table 5 weight threshold
  - 16’ wide loads and 17’ vertical clearance

- Barrier to barrier lane width requirements
  - 16’ on authorized, black routes
  - 14’ on non-authorized, red routes

- Short-term lane or ramp closures require 14-day notice to Motor Carrier Division for single trip permit routes if the load cannot be waived through.
Lane / Capacity Restrictions

- Short-term and long-term determinations and hours of operation
- Determined using ODOT Work Zone Traffic Analysis methodologies
- Use methodology and engineering judgment
Detours / Diversions

• Definitions

• Detour
  – Must be able to carry traffic that is on original route
  – Work closely with Region and MCTD

• Diversion
  – Design to operate as existing route to minimize disruptions, slowdowns
Access

- At Interchanges and Intersections
- At all residences, farms, and businesses
- Consider loads that must traverse this route and how they perform
- Emergency Services
Time for a new approach

In the past, projects addressed issues in this order:

Design -> Mobility -> Construction

In Oregon today, mobility issues must be resolved first:

Mobility -> Design -> Construction
Who’s working on mobility?

- Statewide Traffic Mobility Manager
- ODOT Deputy Director Highway
- Mobility Management Steering Committee
- Four Corridor Mobility Committees
- Regional Mobility Committees
- ODOT Motor Carrier Division
- ODOT Regions
- Oregon bridge delivery partners
Three Levels of Mobility

• Program-level planning
  – Ensure an unrestricted freight route for north-south and east-west traffic through Oregon

• Corridor-level planning
  – Monitor each corridor and ensure delays don’t exceed maximum limits. Determine how many projects can be under way at once

• Project-level planning
  – Ensure that each project observes the minimum mobility requirements for maintaining unrestricted freight routes
Mobility Approaches
Statewide Planning

- Statewide Mobility Committee
  - Membership includes freight stakeholders

- Statewide Traffic Mobility Manager
  - Randal Thomas
  - Forecast and resolve conflicts

- Development of Methods/Systems
  - Highway Mobility Operations Manual
  - Training for the Manual
  - Mobility Database
Highway Mobility Operations Manual

- A collaborative effort
- Establishes ODOT’s policies and procedures, roles and responsibilities and the kind of outcomes expected from us by the legislature, stakeholders and the public
Mobility Operations Room

- A fully functioning, mobility intelligence and command center
- The room houses a state-of-the-art mobility tracking database
**Mobility Approaches**

**Corridor Management**

- Maintain North/South and East/West Routes
- Corridor Mobility Committees meet to discuss cross-jurisdictional concerns
- Managing Delay through the use of Delay Thresholds
- Construction Stages for Corridors
Delay Thresholds

- Corridors broken into segments
- Delay thresholds assigned to segments
- Delay thresholds to be enforced 24/7/365
- Detailed delay estimates are needed to help manage mobility
- Delay estimates required for all projects
- Estimated delays on each segment must be compared to thresholds
**Delay Thresholds**

- Background
- Application in the Design Process
- Application during Construction

**Definition of work zone delay:**

Additional travel time required to travel from one point to another as a result of work zone activities
Delay Thresholds

Thresholds are used to limit delays in segments

Segment Delay Threshold = 7 minutes

Segment Delay Estimate = 5 minutes

- Project 3 Delay Estimate = 1 minute
- Project 2 Delay Estimate = 2 minutes
- Project 1 Delay Estimate = 2 minutes
Key Issues:

1. Approved I-5 Delay Exceptions
   • Segment 4A - Bundle 307: Winston – McClain
     *(Single Weekend in Fall 2009 or Spring 2010)*

2. Probable Delay Exception Needed
   • Kobemik Slide Complex – Unit 1 in 2010
     *(20-30 minute delays for up to six weeks)*

3. Potential Delay Exception Needed
   • Del Rio Interchange in 2010-11

4. 2009 Stimulus Projects
   • Region 3 has twelve 2009 stimulus projects. Two of these are still under construction on I-5, one is just an extension to previously planned work. Delays on the I-5 projects are expected to be less than 2 minutes.
   • Two stimulus paving projects are on Hwy 38. The projects are in two different mobility segments and delays should be below the thresholds.
   • Three stimulus projects are on Hwy 101, one is an extension of an existing projects. The projects are in three different mobility segments and delays should be below the thresholds.
   • One new stimulus project is scheduled for Hwy 199. Delays should be below thresholds.

5. 38/42 Coordination
   • 2009: 4 projects on Hwy 38, none on Hwy 42
   • 2010-11: 3 projects on Hwy 42, none on Hwy 38
# STIP & OTIA III Delay Forecast Summary – 2009-2010

<table>
<thead>
<tr>
<th>Highway/Segment</th>
<th>Forecast Aggregate Average Peak Delay</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interstate 5</strong></td>
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<tr>
<td>4A (Goshen – Hwy 42) – 7 min</td>
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<tr>
<td>4B (Hwy 42 – Hwy 199) – 7 min</td>
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<tr>
<td>4C (Hwy 199 – CA Border) – 7 min</td>
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<tr>
<td><strong>Highway 38</strong></td>
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<tr>
<td>14A (Reedsport – Elkton) – 15 min</td>
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<tr>
<td>14B (Elkton – Drain) – 10 min</td>
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<tr>
<td><strong>Highway 42</strong></td>
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<tr>
<td>16A (Coos Bay – Coquille) – 10 min</td>
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<tr>
<td>16B (Coquille – Winston) – 20 min</td>
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<tr>
<td><strong>Highway 199</strong></td>
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<tr>
<td>18A (I-5 – California Border) – 15 min</td>
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<tr>
<td><strong>Highway 101</strong></td>
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<tr>
<td>5G (Hwy 126 – Hwy 42) – 10 min</td>
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<tr>
<td>5H (Hwy 38 – Hwy 42) – 10 min</td>
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<tr>
<td>5I (Hwy 42 – Port Orford) – 15 min</td>
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<tr>
<td>5J (Port Orford – Hwy 199) – 20 min</td>
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</tr>
</tbody>
</table>

- Exceeds delay threshold
- Exceeds delay threshold – but exception(s) approved
- Below delay threshold
- Below delay threshold – but missing some estimates
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I-5 Delay Forecast Summary - 2009-2012

I-5 Segment 4A  Hwy 58 – Hwy 42 (7 min delay threshold)

2009-12 NB Delay Estimates

Region Projects Not Yet Included
- Del Rio Interchange – 2010/11
- Sutherlin Climbing Lane – 2011
- Oakland/Sutherlin IM - 2011
## Project Activity Map (Segment 4A = MP 119 - 185)

### Projects Scheduled for 2008 Activity

<table>
<thead>
<tr>
<th>Bundle</th>
<th>Project Description</th>
<th>Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle 352:</td>
<td>Shady Bridge (MP 119-121) (3 bridge replacements) No Planned Long-Term Lane Closures</td>
<td>2004-10</td>
</tr>
<tr>
<td>Bundle 353:</td>
<td>Sutherlin – Roseburg (MP 125-139) (8 bridge replacements – 2 repairs – I&amp;M) No Planned Long-Term Lane Closures</td>
<td>2004-08</td>
</tr>
<tr>
<td>Bundle A04:</td>
<td>Whiteaker Avenue – London Road (Mp 172-174) (3 bridge replacements – 2 repairs) No Planned Long-Term Lane Closures</td>
<td>2007-09</td>
</tr>
<tr>
<td>Bundle 310:</td>
<td>Coast Fork Willamette – Martin Creek (MP 169-172) (5 bridge replacements) No Planned Long-Term Lane Closures</td>
<td>2008-10</td>
</tr>
<tr>
<td>Bundle 312:</td>
<td>Camas Swale – Saginaw Road (MP 176-185) (3 bridge replacements – 1 repair) No Planned Long-Term Lane Closures</td>
<td>2008-09</td>
</tr>
<tr>
<td>Bundle 308:</td>
<td>Umpqua River Bridges (MP 129) (2 bridge repairs) TBA – Need to coordinate repairs on I-5 with work on Old Winchester Bridge</td>
<td>2008-10</td>
</tr>
<tr>
<td>I-5:</td>
<td>Winchester Paving (MP 129-130) (Grind/inlay NB &amp; SB) (Combined with I-5: Grant Smith Rd O’xing—MP 118.5) Planned night-time lane closures: approx. 9:45 pm – 4:45 am; all lanes open during the day. Open lane will be 12'-13' wide between North Umpqua River bridges and Del Rio Rd. over-crossing. Estimated delay: &lt; 3 minutes</td>
<td>2008</td>
</tr>
<tr>
<td>Bundle 309:</td>
<td>Rice Hill Frontage - Comstock (MP 148-164) (6 bridge repairs + Martin Creek – Elkhead IM) Single Lane Traffic at Several Rural Locations (Dates TBA)</td>
<td>2008-09</td>
</tr>
</tbody>
</table>
Workzone Traffic Analysis

Data Sources:
- Existing Annual Average Daily Traffic
- Truck Percentages
- Terrain
- Existing Speed Limits
- Number of Lanes
- Growth Rate
- Facility Classification (Freeway, NHS, Freight Route, Scenic Byway...)
- Manual Counts
Workzone Traffic Analysis

- Delay estimates and work windows can be generated quickly
- Estimates can be used to help develop staging strategies
- Ability to predict delays/travel times for work zones, segments, and corridors
  - Location entered by highway and milepost
  - Work windows and estimated delays for multiple staging types for every month of the year
Oregon Department of Transportation

<table>
<thead>
<tr>
<th>Hwy #</th>
<th>MP</th>
<th>ODOT #</th>
<th>Date</th>
<th>Time</th>
<th>Type</th>
<th>Speed Limit</th>
<th># Running Lanes</th>
<th>RCP Length</th>
<th>Route Name</th>
<th>Future Notes</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Note: Above results do not include consideration of holidays or special events. Weekends are typically Friday through Sunday and Weekdays Monday through Thursday.
Historical data shows spikes around Thanksgiving

Peaks near 800 vph

Volumes still low enough for lane closures
Mobility Approaches
Corridor Management

• Construction Stages for Corridors
**Mobility Approaches**

**Region Management**

- Region Mobility Committees meet to discuss projects – coordination between ODOT and OBDP projects.

- Testing of ideas and concepts with the “ground troops”.

- Estimating project delays and comparing to the delay thresholds to determine how to plan/schedule future projects.
Mobility Approaches

Project-Level Mobility

- Transportation Management Plan (TMP) – formal report that documents overall approach to maintaining mobility
- Traffic Control Plan (TCP) - staging plan showing traffic control measures
- Project Specifications – text describing written requirements (i.e. hours for lane closures, minimum lane widths, etc.)

These three documents compliment each other!
Mobility Approaches
FHWA Provisions For TMPs

• The Final Rule on Work Zone Safety and Mobility – 23 CFR 630 Subpart J
  – All states need to Implement by October 12, 2007

• Provides for Processes including a Transportation Management Plan
  – Transportation operations strategies to ease work zone impacts.
  – Public information strategies
  – Other elements
**Statewide Mobility Planning**

- Oregon is open for business!
- ODOT does not anticipate major traffic delays from construction
- ODOT is managing projects to control and minimize delays
  - Night-time and “off-peak” work
- At times there will be some impacts to the traveling public
Slow down. He’s working for you.
2006 Mobility Monitoring Pilot

- Test new technology for mobility monitoring
- Determine applicability for future work
  - Traffic sensor (side fire radar) based travel time system
  - Transponder based travel time measurement
- Deployment and operation by International Road Dynamics
- Management and evaluation by OBDP
Site Layout

- I-5 southbound traffic
- Message sign
- Traffic sensors
- Work area
**Transponder based travel time monitoring system**

- Greenlight system for weigh station preclearance uses transponders on commercial vehicles
- Transponders can also be used as probes for determining travel time
2006 Pilot – Monitoring Travel Time with Transponders

- Three detection locations
AVI Detection Trailer
Daily Travel Time Graph

Data Date: Wednesday, October 04, 2006
Generated on: Monday, November 06, 2006
3:33 PM

Travel Time

- 1 to 2 No Delay
- 2 to 3 No Delay
- 1 to 3 No Delay
- 1 to 2 AVI
- 2 to 3 AVI
- 1 to 3 AVI
- Tn100 Time
**Conclusions of 2006 Pilot**

- Analysis and evaluation performed by Oregon Bridge Delivery Partners
- Both approaches have merit
  - Traffic sensor approach (side fire radar) more applicable at project level
  - Transponder based system more applicable at regional or corridor level
Summary

- Extensive construction is taking place in Oregon
- Freight mobility **must** be maintained
- Programs, systems, and processes are in place to manage mobility
- Elevated Mobility awareness and its affect on the economy.
Thank you!

Questions?

ODOT Traffic Mobility Website:
http://www.oregon.gov/ODOT/HWY/mobility.shtml