Weather-Responsive Active Traffic Management

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Road Weather Management Stakeholder Meeting
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Oregon Route 217

- Closely spaced interchanges
- 7.52 miles
- 2-3 lane freeway
- 122,000 ADT
- <5% heavy vehicles
ORE 217 ATM

- 265 crashes per year
- Crash every other day
- Most during peak periods
Planned Solution (2004)

Add lanes, braid ramps

$1 billion for 7.5 miles
New Planning Goals (2011)

- Find a lower cost strategy to improve conditions now
- Not replace the previously established long term needs of the corridor
- Be consistent with the long term corridor plan
Targeted Safety Improvements

Affordable improvements we can build today, with immediate driver benefits:

- Traveler information system
- Queue warning system
- Variable advisory speeds
- Curve warning system
- Updated adaptive ramp metering
- Targeted shoulder widening

Total Cost: 1% of $1 Billion
**ITS Equipment**

- 28 variable advisory speed signs
- Seven mainline VMS
- Six arterial VMS
- Four RWIS grip factor sensors
- Five radar traffic sensors
- 12 Bluetooth sensors
- 24 Ramp Meters
- 20 mainline loop data stations
- 11 CCTV Cameras
Travel Time

- Displayed during peak times

- Combines data from vehicle induction loops, radar and Bluetooth sensors
Queue Warning System

- Reduce sudden braking and rear-end collisions
- Provide details on distance to queue
- No message if already congested
Congestion Responsive VAS

- Each subzone’s speed determined by the lower of:
  - Local 85th percentile speed
  - Downstream speed + step (5-10 mph)
- Speeds measured by dual loops and radar
- Speeds < 30 mph display “SLOW”
Weather Responsive

- Goal is to notify drivers of adverse weather conditions by:
  - Providing advised speeds for different adverse weather events (including visibility)
  - Using applicable messages on VMS during adverse weather events
- Four RWIS grip factor sensors installed in corridor
- Worst weather condition will control whole corridor
# Weather Responsive

## Weather Speed Lookup Table

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## Weather VMS Message Lookup Table

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*Snow zone chain requirement messages for VMS will come from ATMS/TOCS*
Variable Advisory Speed
Curve Warning System

US26 / OR217 Interchange
Crashes by Road Surface Condition

- Wet, 81%
- Dry, 14%
- Ice, 1%
- Unknown, 4%
Curve Warning System

- Activates based on grip factor
- Sensors
  - Temperature
  - Moisture
  - Visibility
Mt Hood ATM

- US26 & ORE35
  Variable Advisory Speed
- Federal Grant
- Recreational route
  - Through traffic in summer to central Oregon
  - Skiing on Mt. Hood in winter
Variable Speed based on Weather
Warning based on Road Condition
Weather Responsive Evaluation Plan

Evaluation Objectives:

1. Measure impact on mean speeds and speed distribution
2. Measure impact on incident rates
3. Measure driver compliance
4. Compare weather based speeds to congestion based recommended speeds
5. Measure impact on reliability
6. Document lessons learned
Travel Time Reliability Improvement
with Ramp Meter upgrade, Travel Time, and VAS

Before and After Travel Time Reliability, OR-217 NB Left Lane

- Average Buffer Index before VAS = 48.8%
- Average Buffer Index after VAS = 27.64%
- Before = July 2012 midweek days
- After = Midweek days from the past three weeks
Project Timeline

- US26/ORE217 Curve Warning      Feb 2014
- ORE217 Congestion VAS             July 2014
  I5/I405 Congestion VAS
- ORE217 Weather VAS                Sept 2014
- I5/ORE217 Curve Warning           Oct 2014
- Mt Hood VAS                                2015