Eastern Oregon Prioritizes ITS Solutions to Improve Safety Along a Rural Interstate

Presented by: Jim Peters, P.E.
“20-Vehicle pileup shuts down I-84 east of Pendleton”

“Nine dead, more than 20 hurt in bus crash on icy I-84”

What’s the Problem?
Cabbage Hill – High Crash Area

Rural and remote areas with limited cell service, power, and communications

ADT = 8,000 to 14,000

Up to 50% ADT = heavy vehicles

Varying terrain

Harsh winter weather conditions

Severe crashes and extended closures (no alternate routes)
Project Process

Understand Corridor Conditions

Develop Project Goals and Objectives

Identify Needs

Match Needs to Strategies

Screen Strategies

Recommend Strategies

Stakeholder Input:
- ODOT
- Oregon State Police
- Transit Agencies
- Local Businesses
- Tribal Representation
- Incident Responders
- Local School Districts
- Freight Companies
- Local Agencies
- Representatives from Elected Officials
Problem: High Crash Rate in Winter Months

Winter Months
- Lower traffic volumes
- Highest no. of crashes

Summer Months
- Highest traffic volumes
- Lowest no. of crashes

Bar graph showing the number of crashes by month, with peaks in January and December and lows in July and August.
Problem: High Crash Rate in Winter Months

- 33% decrease in traffic volume
- 450% increase in crashes
Recommendation: Weather Responsive Variable Speed System

System uses: grip factor, visibility, precipitation, and temperature
Benefit Cost Ratios

Design and Construction Advancing

Variable Speed Segment
Benefit Cost Analysis

Study Corridor
State Boundary
Region Number & Boundary
District Number & Boundary

Note: I-84 Crash Data: 2012-2014 (3 years)
I-82 Crash Data: 2010-2014 (5 years)

Variable Speed System currently active in Baker Valley Area
MP 277-306

VSL Study Segment 1:
Cabbage Hill & Meacham Areas
MP 217-252

VSL Study Segment 2:
Grande Ronde River Area
MP 252-259

VSL Study Segment 3:
Ladd Canyon Area
MP 266-277

VSL Study Segment 4:
Burnt River Canyon Area
MP 314-345

VSL Study Segment 5:
1-82 between I-84 and Washington State Line

Benefit Cost Summary

<table>
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<tr>
<th>Segments</th>
<th>Benefit Cost Ratio Range</th>
<th>Estimated Implementation Cost</th>
<th>Annual Reduction in Crashes</th>
<th>Annual Benefits</th>
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Problem: High Crash Rates in Low Visibility Conditions

60% of crashes occur during compromised visibility conditions.
Recommendation: Enhanced Delineation and Curve Warning Signs

Reduces nighttime curve crashes by 30% and other crashes by 10%
Problem: Slow to Close the Interstate During a Winter Weather Event

Worker Safety:
Maintenance staff required to set cones in roadway for closure, working in hazardous conditions

Traveler Safety & Faster Re-Opening:
Less traffic entering hazardous conditions decreases the likelihood of a crash & allows
Recommendation: Remotely Operated Gates
Problem: Back-up at Chain-Up Areas
Problem: Back-ups at Chain-Up Areas

Chain-up Area
(length varies by location, 0.2 to 1.3 miles)

Chain-up area begins

Trucks see others chaining up & pull over thinking the chain-up area is full. Trucks then create a safety hazard blocking the right lane of traffic.

Safety Hazard:
Potential for crashes and endangering truck
Recommendation: Chain-Up Area with Real-Time Parking Information
Problem: Travelers are Frustrated During Extended Closures

Key Issues:
Lack of truck parking – cascading closure impact
Lack of information available to travelers
Recommendation: Improve...

- Truck parking management plan
- Traveler information during a closure – provide as much detail about the closure as possible (no estimate for duration)
How ODOT is Thinking About Connected Vehicles
Key Takeaways...

- Initial cost is high due to power and communications, but it lays the foundation to address the problem.

- Systems are designed to share through the cloud.

- Stakeholder input provided unique local knowledge, especially surrounding freight issues.
Questions?

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