Progress of the North/West Passage Operations and Travel Information Integration Sharing (OTIIS) Project

National Rural ITS Conference

August 26, 2014
Overview

• Background
• System Development
• Deployment Plan
• Website Demo and Mobile App Status
The North/West Passage

Transportation Pooled Fund
I-90 & I-94  8 states  ~3200 miles of interstate

Major east-west corridor for commercial and recreational travel
Network Truck Flows
Network Truck Flows

ND

SD

MN

WI

Network Flows (Tons)
- 0 - 500,000
- 500,001 - 1,000,000
- 1,000,001 - 5,000,000
- 5,000,001 - 10,000,000
- More than 10,000,000

Network Flows (Tons)
- 0 - 250,000
- 250,001 - 500,000
- 500,001 - 750,000
- 750,001 - 1,000,000
- More than 1,000,000

Network Flows (Tons)
- 0 - 500,000
- 500,001 - 1,000,000
- 1,000,001 - 2,000,000
- 2,000,001 - 5,000,000
- 5,000,001 - 10,000,000
- More than 25,000,000

Network Flows (Tons)
- 0 - 500,000
- 500,001 - 1,000,000
- 1,000,001 - 2,000,000
- 2,000,001 - 5,000,000
- 5,000,001 - 10,000,000
- More than 25,000,000
Daily Traffic

CVO AADT:

ITRR annual visitation:
Project Goals

Research, develop, and operationally test a technology solution:

- Traveler Information → decision making → safer and more efficient;
- Agency Coordination → response to weather events, serious incidents;
- Influence Positive Driver Behavior Changes → safety, efficiency;
- API Opportunities → Connect Vehicle, sustainable business model;
- Increase Awareness → public education and marketing

Corridor-wide Traveler Info Website
Mobile App with push notifications
API for expansion, integration
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Literature Reviewed

• Trends in Current Traveler Info and Technology
  – Reports, Journal Articles and Conference Proceedings

• 511 Coalition Findings

• Existing Private Sector Systems

• The Future: Connected Vehicles
From the Literature

• Corridor-wide traveler information that extends beyond an individual state is desired
• Personalized information preferred
• Push type notifications gaining in popularity
• Mobile devices favored
• Social media tools are increasingly used for information dissemination
• Tourism Destination Anchors are important marketing focal points
Survey of Steering Committee Members

• Rank the importance of various aspects of traveler info
  – CVOs and Recreational Travelers (Pre-trip and En-route)
Mockups, ConOps, Prototypes

Used to gather feedback from:

- Steering Committee and other DOT Stakeholders,
- ATA and State Trucking Associations,
- Usability Testing Participants
  - NWP corridor *truck drivers*
  - NWP corridor *general travelers*
Mockups, ConOps, Prototypes
Mockups, ConOps, Prototypes

<table>
<thead>
<tr>
<th>What would you like to see?</th>
<th>Summary 1</th>
<th>Sort by:</th>
<th>Summary 2</th>
<th>Sort by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Work</td>
<td>Route Length: 1280mi</td>
<td>Distance</td>
<td>Route Length: 1314mi</td>
<td>Distance</td>
</tr>
<tr>
<td>Incident</td>
<td>Ideal Time: 18hr 14min</td>
<td>Type</td>
<td>Ideal Time: 18hr 34min</td>
<td>Type</td>
</tr>
<tr>
<td>Road Conditions</td>
<td>9/1/2013 9:57am</td>
<td>Two vehicle collision...</td>
<td>9/5/2013</td>
<td>20 miles east of Rapid...</td>
</tr>
<tr>
<td>Weather</td>
<td>Active: 9/21/2013</td>
<td>80 miles west of Fargo...</td>
<td>Active:</td>
<td>10/8/2013</td>
</tr>
<tr>
<td>Mountain Pass</td>
<td>Status: Trucks under 12' only</td>
<td>High wind warning. Forecast 9/2 AM...</td>
<td>Status:</td>
<td></td>
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<tr>
<td>Cautionary Zones</td>
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<td>Weigh Station</td>
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<td>Rest Areas</td>
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<td>Truck Parking</td>
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<td>Scenic Routes</td>
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<td>National Parks</td>
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<td>National Monuments</td>
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<td>Fuel Stations</td>
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<td>Truck Stops</td>
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<td>State Parks</td>
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<tr>
<td>National Historic Landmarks</td>
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</table>
## Usability Testing Results

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Fuel/gas (10)  Cash only gas station</td>
<td>100% of the participants accurately identified the icon with fuel/gas station.</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Rest area (11)</td>
<td>100% of the participants accurately related the icon with a rest area.</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Truck parking, rest area (9)  Truck idling  Semi only parking</td>
<td>About 82% of the participants accurately identified the icon with a stop area or parking for trucks.</td>
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<tr>
<td><img src="image" alt="Icon" /></td>
<td>Not sure  Trucks are prevented on this route  Truck driving from opposite direction  Low visibility ahead  Truck stop  Trucks merging into traffic  Wide load</td>
<td>About 18% of the participants related the icon with its intended meaning of truck restrictions. About 27% reported not knowing or understanding the icon. Most of the participants were able to relate the icon with truck information.</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td>Don’t know (4)  Road is flat ahead  Do not enter (2)  Road close  No Semi’s  Level surface ahead  Caution</td>
<td>About 36% of the participants did not know the meaning. About 27% of the participants accurately related the icon with road closure or do not enter.</td>
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</tbody>
</table>
Select Usability Results

Comments from the participants:

• “I like the grouping of the icons for the historic places and I like the way the national parks are separate from other parks”
• “I love this website, I would definitely use it”
• “I love the color coding and the grouping of the choices”
• “Finally the DOT cares about providing for truck drivers (I mean to help them plan their trip)”
• “It will be very useful to have a mobile application”
Select Usability Results

• 8 out of 11 participants mentioned that they would like to see information about rest areas, hotels, restaurants, food, services available and speed limits.

• 8 out of 11 participants asked, or were concerned with, the frequency with which the information will be updated on the website.

• All the participants of the study suggested they would use the website if it was in place.
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• Website and Mobile App Status
Deployment

Sustainable Business Model Investigation

Marketing Plan Investigation

Timeline and Budget

Website launch end of 2014

API launch end of 2014

Mobile App launch TBD
## DOT Provided Data Status

<table>
<thead>
<tr>
<th>State</th>
<th>Road Work</th>
<th>Truck Restriction</th>
<th>Crash / Incident</th>
<th>Road Closure</th>
<th>Road Conditions</th>
<th>Traffic Congestion</th>
<th>Camera</th>
<th>RWIS</th>
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<tbody>
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<td>WA</td>
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*Note: The table indicates status for states. Green signifies availability, red signifies unavailability.*

-Montana State University

Western Transportation Institute
Deployment

Coming Soon Website: Coming Soon
Next Steps

• Finish Website for public roll-out
• Finish API
• Finish Mobile App
• Accident prediction and integration with freight scheduling
  – Proposal with JB Hunt and Watkins & Sheppard
• Intelligent rerouting
  – Suggest alternative routes in real-time through notifications
  – Balance traffic based on observed shifts
  – Keep trucks on highway, but route passenger traffic onto local roads
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Mobile App Mockups
Mobile App
Mockups
Mobile App Mockups
Mobile App Mockups
Questions