Road Weather Management Initiatives and Tools

Roemer Alfelor

Road Weather Management Program

Federal Highway Administration, USDOT

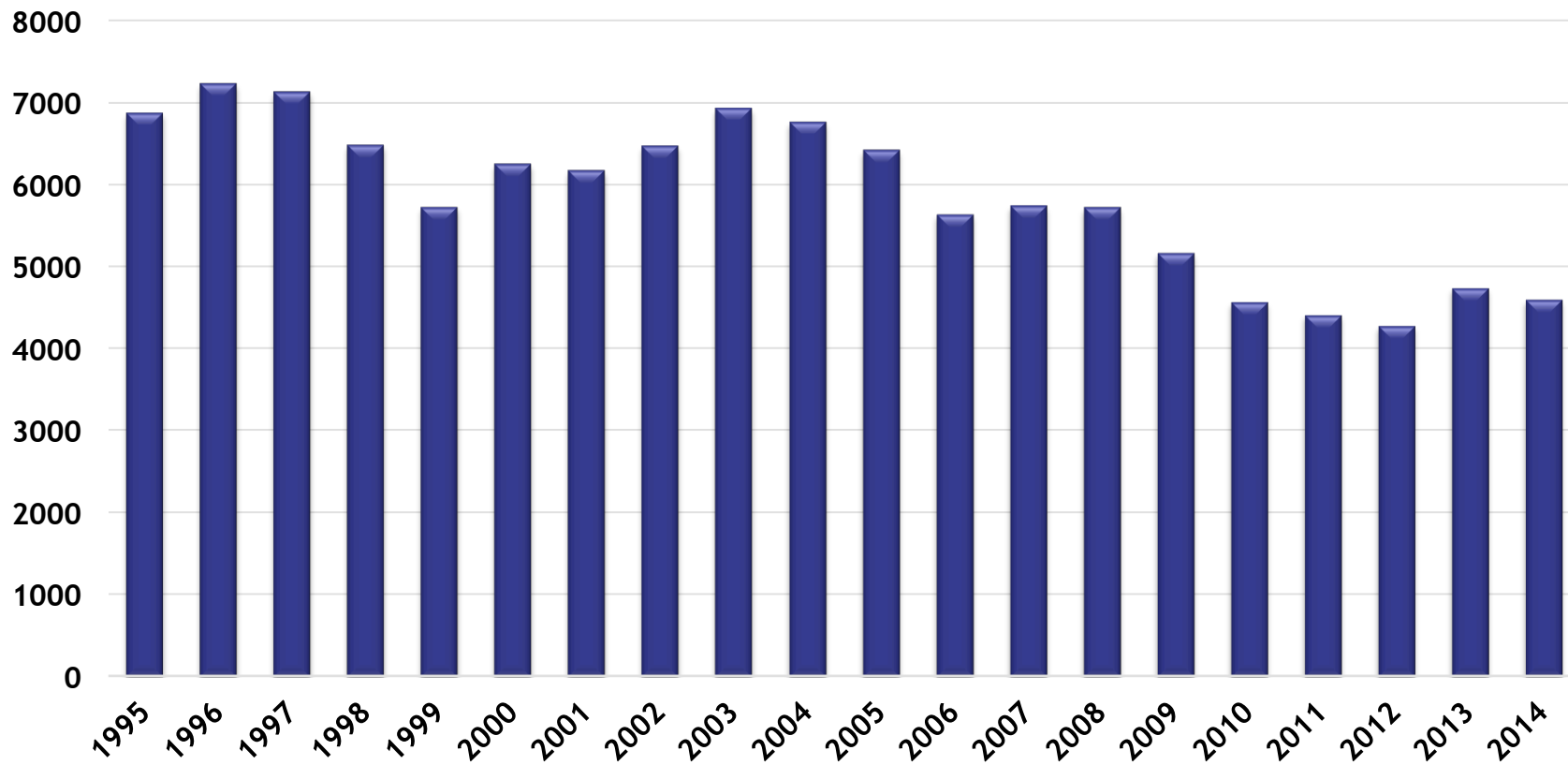Co-Authors: Paul Pisano, Gabe Guevara, Brenda Boyce

Outline

- The Road Weather Problem
- Pathfinder Project
- Integrated Modeling for Road Condition Prediction
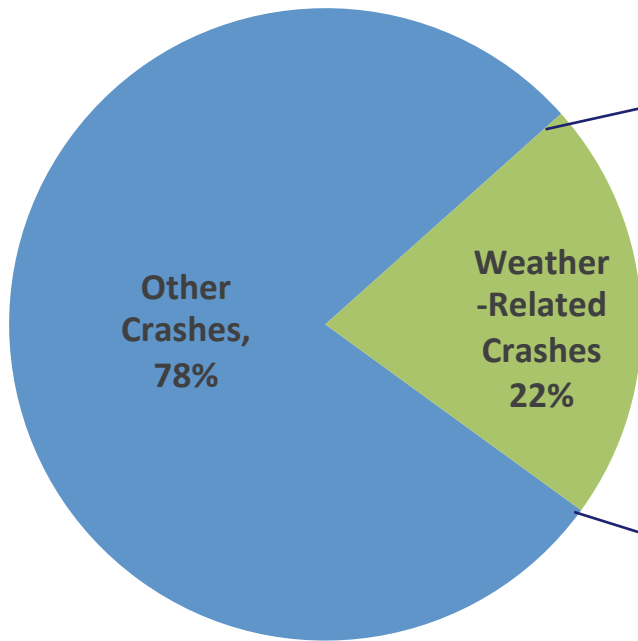- Road Weather Performance Management Tool

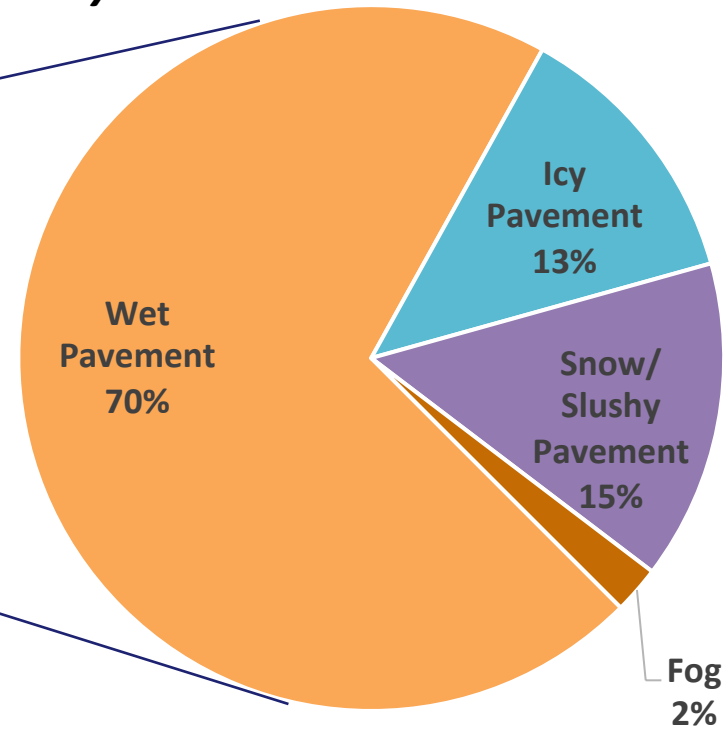# Trend in Weather-Related Fatal Crashes

Weather-Related Fatal Crashes

Weather-Related Crashes

Total Annual Crashes
Average = 5,748,564

- Other Crashes, 78%
- Weather-Related Crashes 22%

Weather Related Crashes
*By Road Weather Condition**

- Wet Pavement 70%
- Icy Pavement 13%
- Snow/ Slushy Pavement 15%
- Fog 2%

*Crashes that occurred under adverse conditions; additional factors such as rain, snow, and fog are not disaggregated from pavement conditions in this graphic. The percentage due to fog is for those crashes that occur under foggy conditions, but not wet, icy, or snowy pavement conditions.

SIRWEC – Ft. Collins, CO – April 2016

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PATHFINDER PROJECT

Pathfinder Goals

Pathfinder promotes collaboration between State DOTs and the Weather Enterprise with the ultimate goals of saving lives and property and keeping the economy moving.

Pathfinder Core Partners

- **National Weather Service:** Experts at weather forecasts

- **Private Sector Weather Providers:** Experts at road weather forecasts

- **State DOTs:** Experts at operating and maintaining the roadways – knowledgeable about the state of the roadways and the impact to the traveling public

- **State Emergency Managers:** Coordinate activities during high impact events

National Weather Service

Private Sector Weather Providers

State DOTs
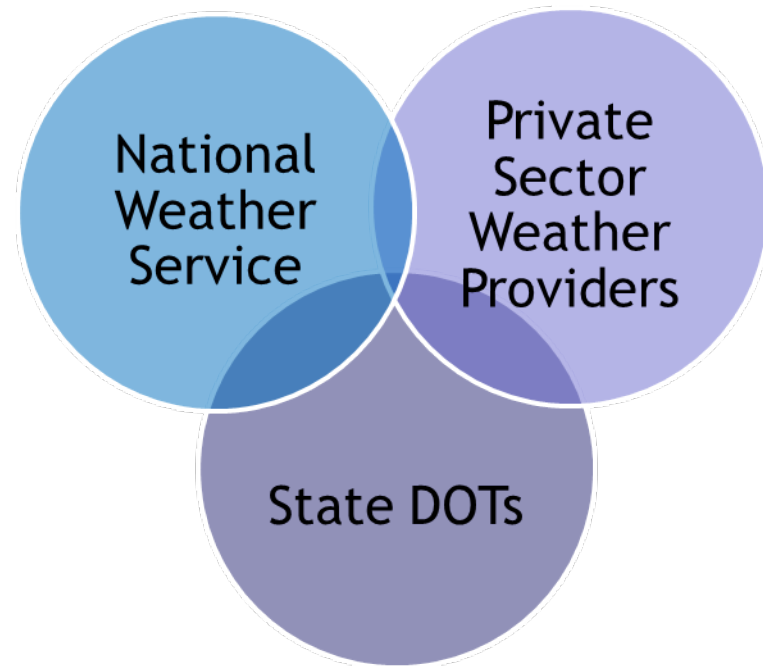
Impacts Are
More Than Just Weather

Weather
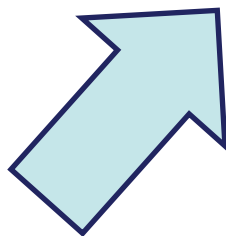
Roads

Impact

Motorists

Timing
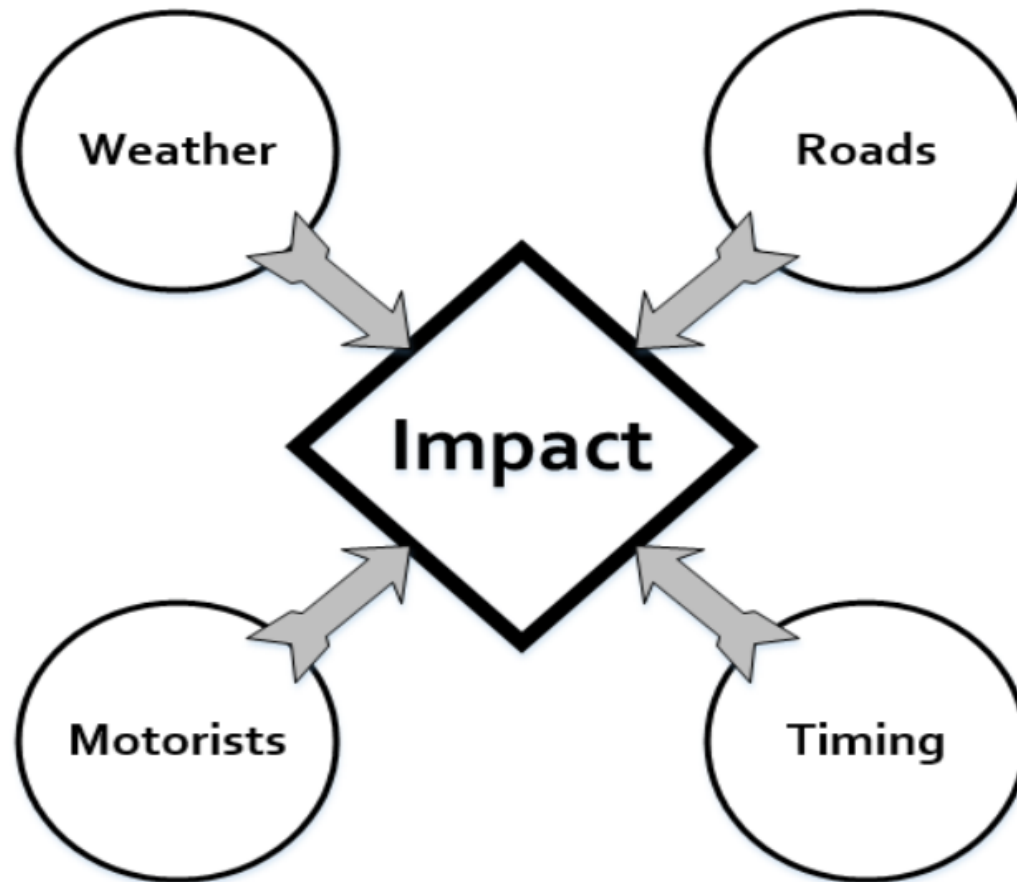
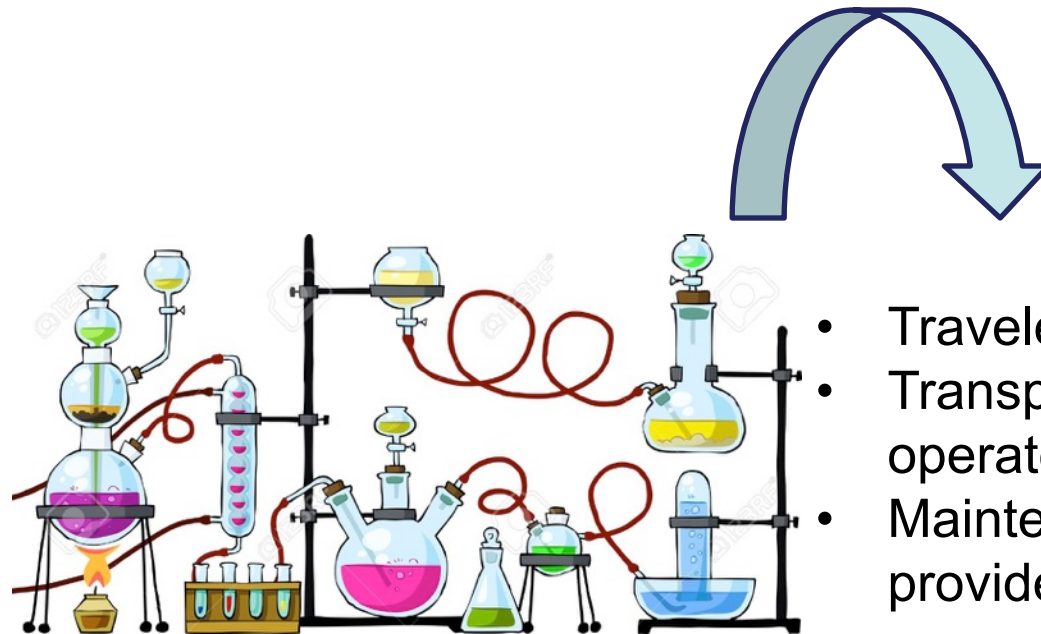# INTEGRATED MODELING FOR ROAD CONDITION PREDICTION (IMRCP)

Integrated Modeling for Road Condition Prediction (IMRCP)

Incorporates real-time and/or archived data and results from an ensemble of forecast and probabilistic models
- atmospheric and road weather
- traffic
- work zones
- incidents
- special events
- demand

- Travelers
- Transportation operators
- Maintenance providers

Weather & Traffic Model Review - Complete
Concept of Operations - Complete
Detailed Requirements - Complete
System Design & Architecture - In Progress

Example Application Scenarios

- Enhanced transportation system management and operations
  - Forecast-aware variable speed limits
  - Enhanced motorist advisories and warnings
  - Intelligent signal controls
- Traffic-aware winter maintenance decision support
- Weather- and traffic-aware routing optimization
  - Commuters
  - Long-haul freight
  - Maintenance vehicles.
  - Emergency responders

ROAD WEATHER PERFORMANCE MANAGEMENT (RW-PM) TOOL

# Road Weather Performance Management (RW-PM) Tool

- Utilizes real-time traffic volume/speed, road weather, maintenance and traffic control strategies
- Continuously updates traffic control, maintenance and advisory recommendations as road weather conditions evolve
- Publishes traveler information into vehicles.

Real-time Continuous Data

Traffic Operation & Maintenance

Traveler Info: Queue Warning Speed, & Pavement Conditions

Road Weather Maintenance

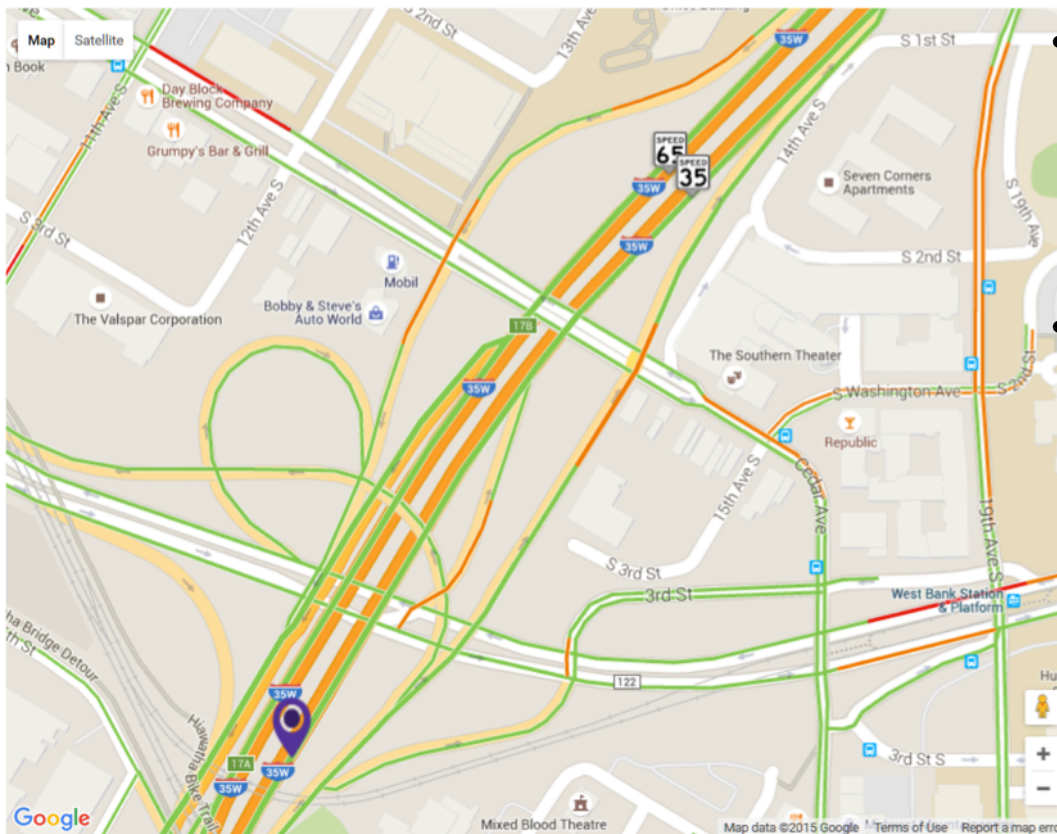## Road Weather Maintenance

Road Weather Maintenance Administration
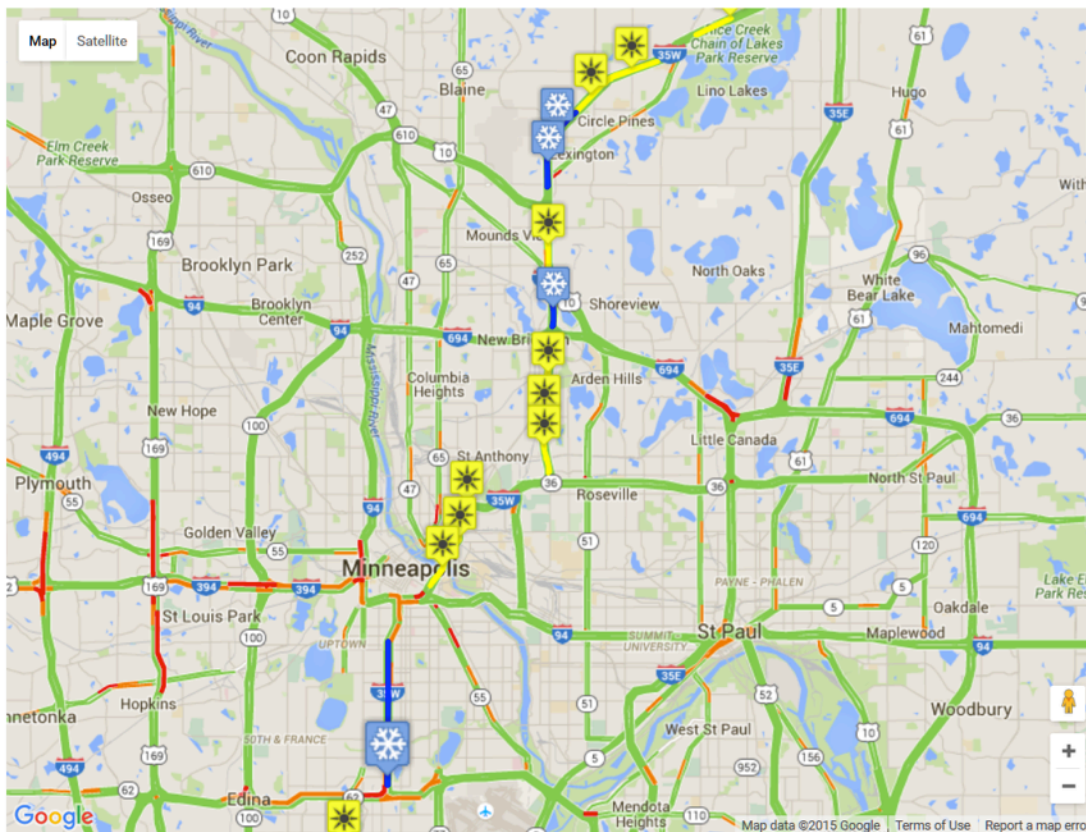
- Displays the segment data Road Treatment Recommendations from Pikalert
- Each site shows an icon based on its current pavement condition

Traffic Control

Traffic Control

Traffic Control Administration

- Displays the existing Traffic Backups (Queues) and Recommended Speeds (from Speed Harmonization).

- Advisories generated by the system are sent to the connected vehicles along with the speed sensor information from MnDOT.

Sample Motorist Advisories

Icy Conditions Ahead With Speed Recommendation

Caution! Icy Road. Reduce Speed
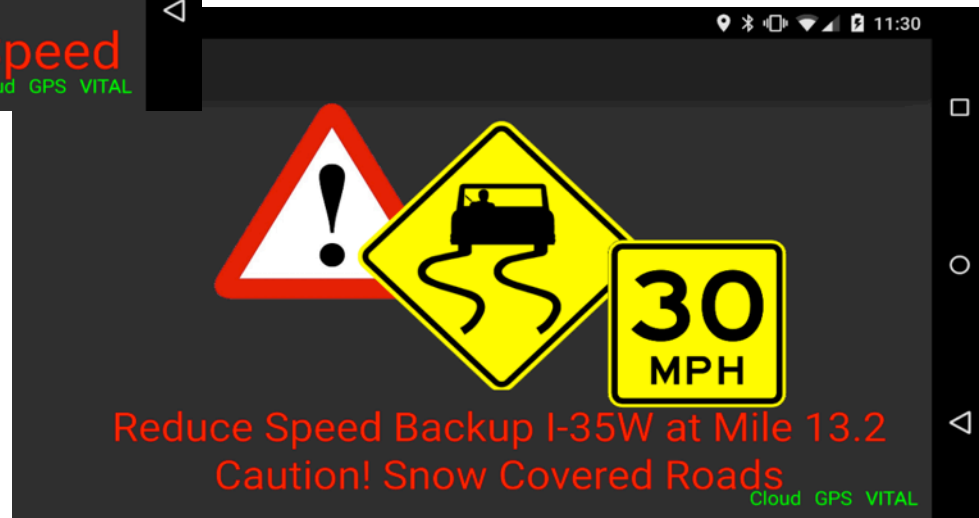
Backup (Queue) with Speed Recommendation (Speed Harm) and Snow Covered Roads

Reduce Speed Backup I-35W at Mile 13.2 Caution! Snow Covered Roads

Contact Information

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