

# CV-related Project Updates

- Integrated Mobile Observations (IMO)
- The Pikalert™ VDT
- Road Weather Applications
  - MAW
  - EMDSS
  - PM Tool



# Integrated Mobile Observations

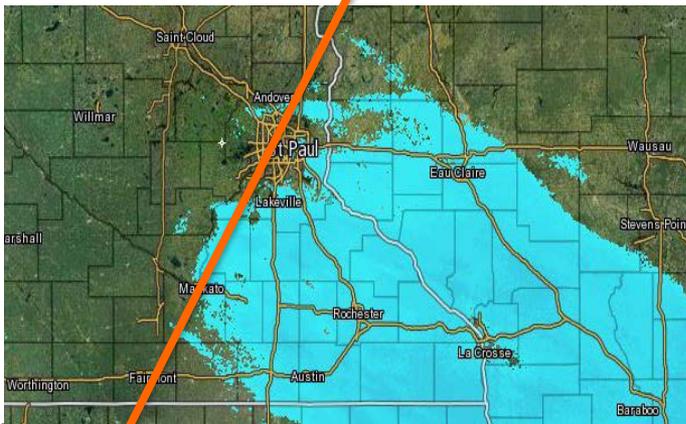
- In the IMO 1 & 2 Phases we
  - Demonstrated the feasibility collecting and transmitting mobile data (CAN-bus and external sensors)
  - Aggregating the mobile data with traditional sources of weather data
  - Ingesting that weather data into enabling systems (WxDE, VDT, IMRCP) and into Wx-related applications (MAW, EMDSS, WRTM, PM-tool) to convert that data into actionable information
  - Between Michigan, Minnesota, and Nevada we have over 600 fleet vehicles collecting and transmitting mobile data
- In IMO 3
  - Collect and transmit data using a hybrid communication System (Cellular, DSRC, Radio) as appropriate
  - Continue to ingest the data into Wx-related applications
  - Perpetuate the prototype systems - keep operational



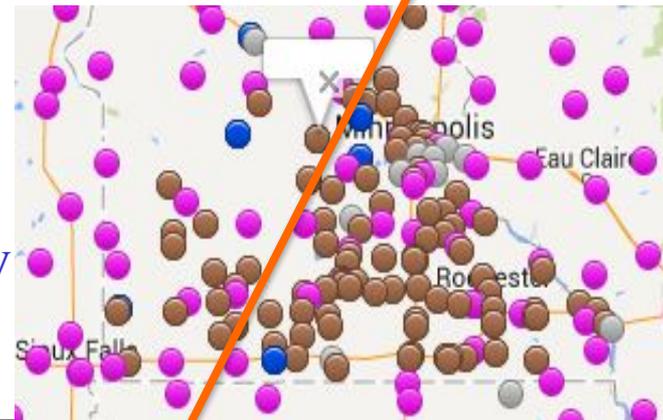
# Benefits of Enabling Systems for CV Road Weather Applications

- WxDE enhances road weather data management and quality checking for improved accuracy of application outputs
  - CV data provides a solid foundation to help develop new Road Weather Connected Vehicle Applications and enhance functionality of existing ones
  - Provides quality checked high resolution road weather data in real time
- VDT has modules for advanced Road Weather Hazard (RWH) and Road Weather Alert (RWA) algorithms that different applications can use

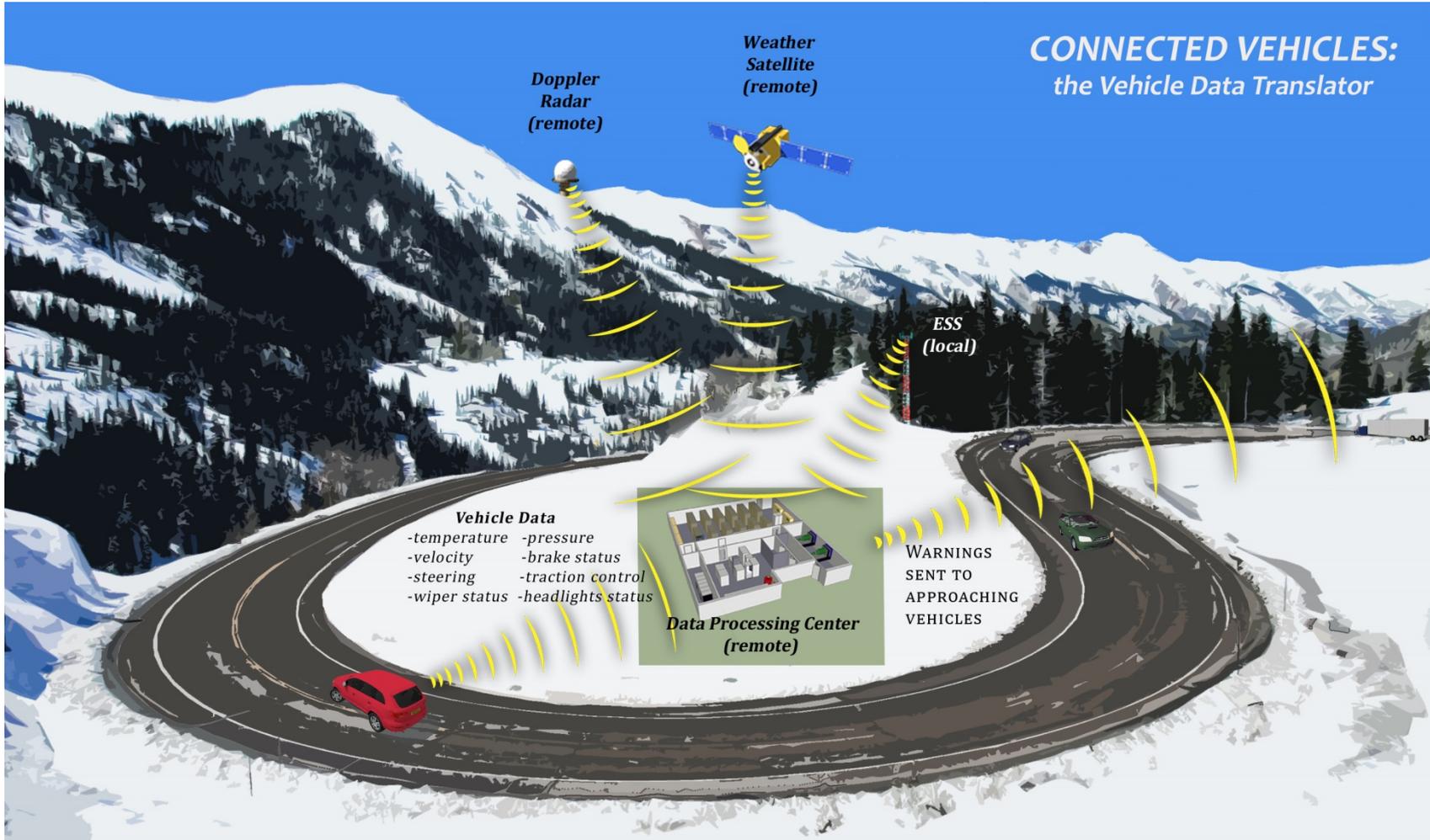
With Radar



With CV Data

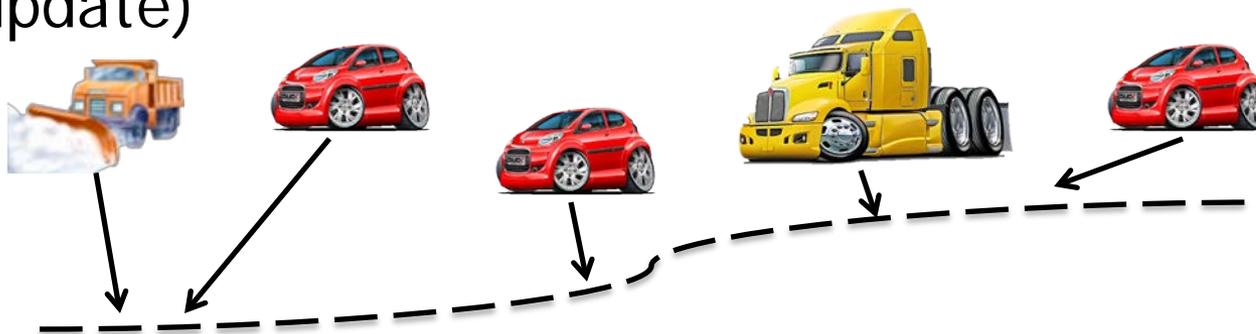


# The Vehicle Data Translator



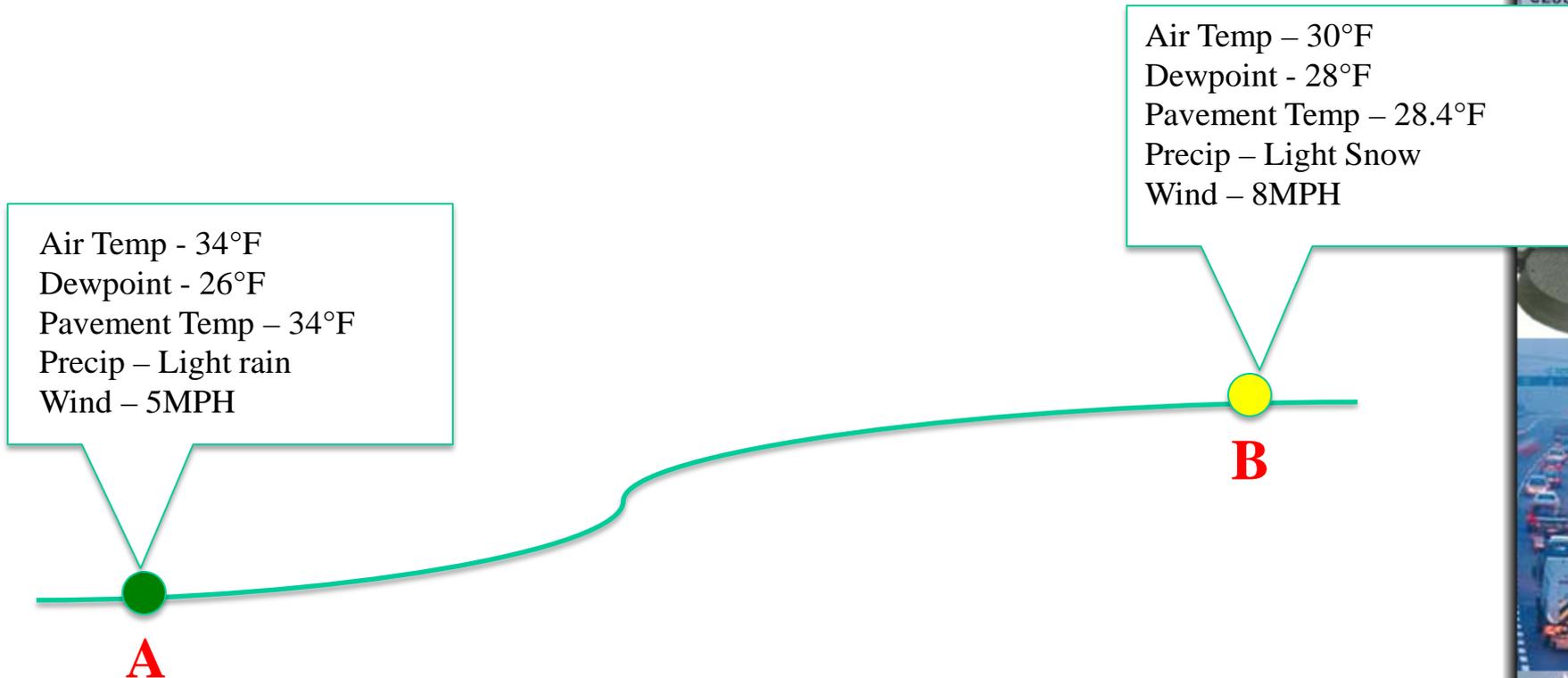
# The VDT provides geographical and time-relevant information

- Collects data from multiple sources and performs QC
- Assigned to user-configured road segments by GPS location and time stamp
- Infers Hazards (precip., pvmnt cond, vis., and generates warnings
- Road segment length and update frequency configurable (default: 1-mile segments and 5-min update)



# EMDSS - what it can do for you

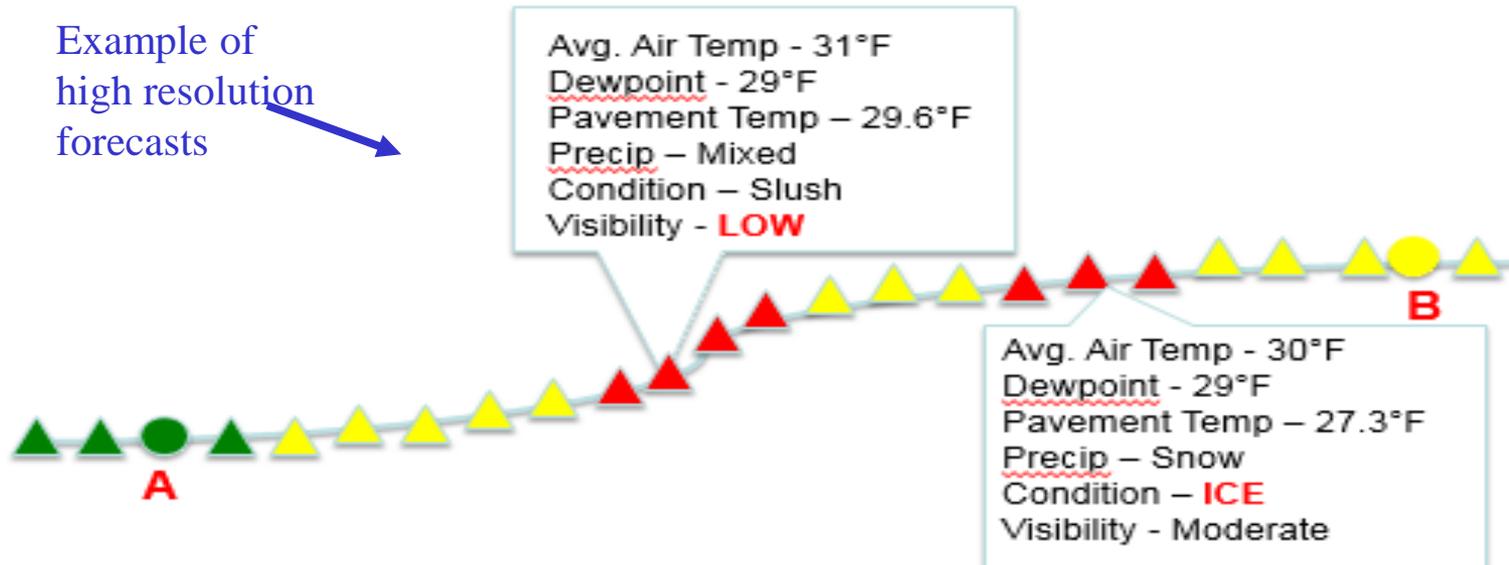
If you relied only on information from your ESS, this may be the only thing you would see...



# EMDSS benefits from leveraged CV Data and VDT outputs...

- With the new improved VDT algorithms the expected benefits of EMDSS are:
  - Improved accuracy of short (12hrs), and medium to long (24 hrs to 48 hrs) high resolution forecasts
  - High accuracy of forecasts will help maintenance personnel draft efficient strategies to optimize labor, equipment and chemicals thereby reducing costs
  - Timely treatment recommendations to potentially improve safety and roadway levels of service during adverse weather

Example of high resolution forecasts



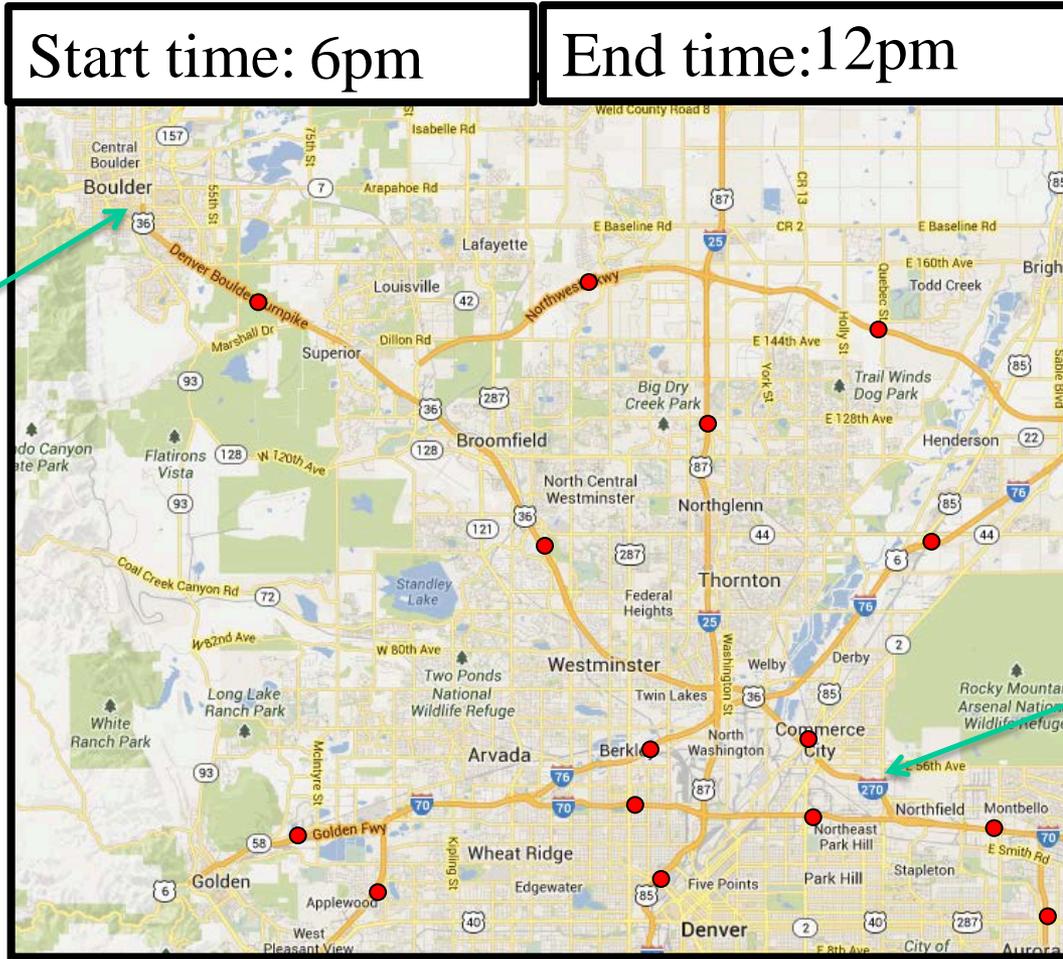
# Check the MAW Forecast

Start time: 6pm

End time: 12pm

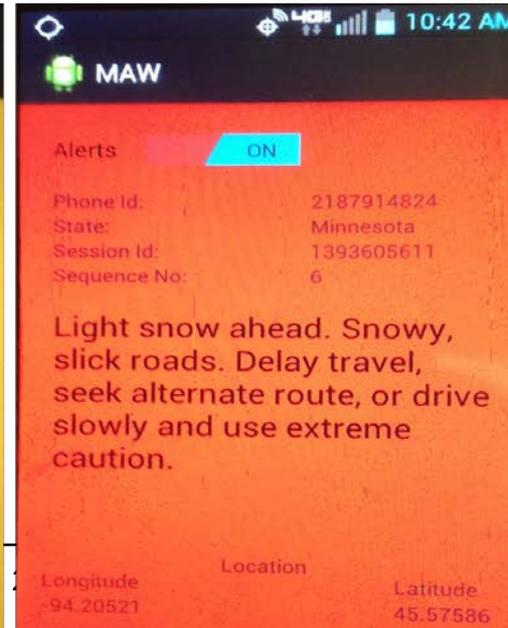
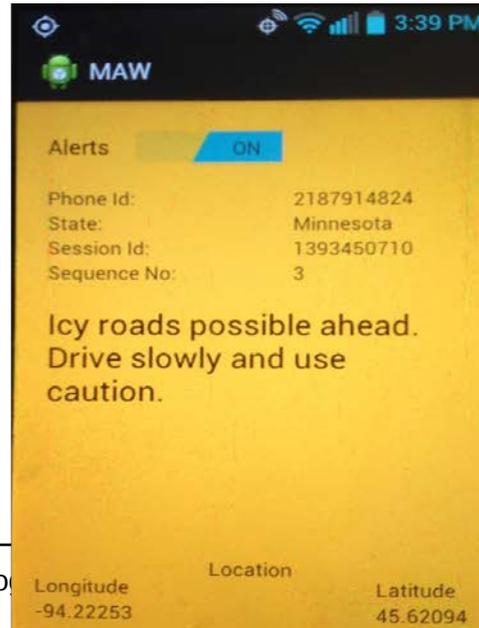
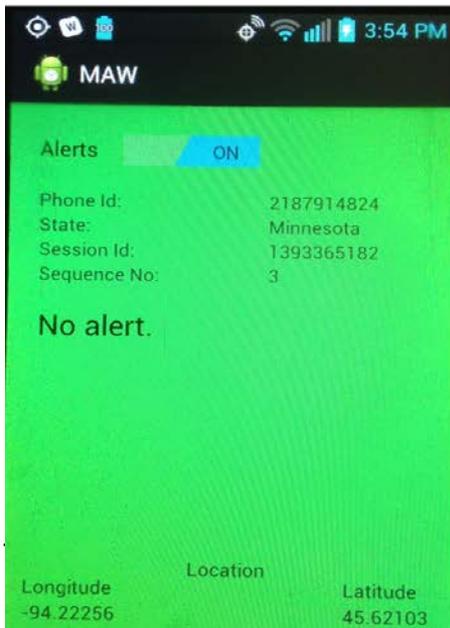
Start

End



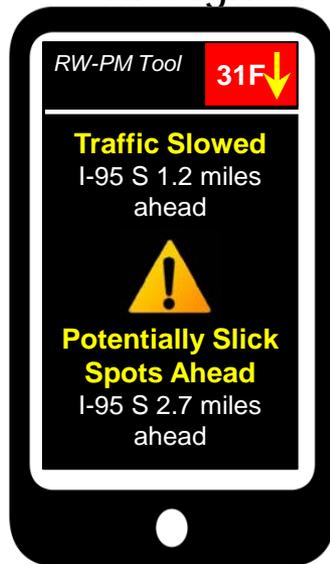
# MAW Estimated Benefits

- With the improved VDT algorithms, the expected benefits of the MAW are:
  - Create advisories and warnings with greater temporal and geographic resolution than is otherwise currently available
  - Provide short time-horizon alerts for visibility, road condition, and road precipitation
  - Provide medium and long term advisories to help motorists better plan trip routes during adverse weather conditions



# Prototyping a RW-PM Tool

- Demonstrate prototype RW-PM tool that provides for
  - Integration of traffic mobility, road weather maintenance and motorist advisory analysis and information
  - Continuous near real-time data processing, including
  - Continuous updating of traffic control, RdWx maintenance and motorist advisory recommendations as RdWx conditions evolve throughout weather events.



# Motorist and Road Weather Maintenance Website Display

- Conceptual illustration of motorists and road weather maintenance RW-PM Website showing map-based traffic mobility and road weather information.

