Vehicles with winter assignments along I-80 were selected.

Makes & models are presently limited to vehicles with compatible CANBus or OBDII vehicle data formats.
NvIMO Coverage Areas via EDACS
Various Weather & MDSS Data Parameters

• Numerous sensors and devices are controlled or monitored by a vehicle-mounted computer.

• Data is logged in-vehicle as well as sent via radio to UNR in near-real-time using the NV EDACS radio network.

• All instrument and equipment installations are being done by UNR & NDOT personnel who are familiar with the vehicles (NDOT) and instrumentation (UNR).
Homegrown System

• Driven by need to use EDACS radio network
Data Being Gathered

• General Data
  – GPS Date, time, location, bearing, speed, altitude, accuracy

• Road Conditions
  – Road surface temperature

• Atmospheric Conditions
  – Pressure, temperature, relative humidity, dew point

• Vehicle & Equipment Data
  – Wheel speeds, brake status, engine intake air temperature & pressure
  – Traction control, ABS, emissions data, engine data, and headlight status
  – Diagnostic trouble codes
Applications in NV

• Equipment Maintenance

• MMS (in progress)
  – Material inventories

• MDSS (future)
  – Winter maintenance decision making
  – VDT: Vehicle Data Translator (NCAR)
  – In-vehicle data
Equipment OBD/CanBus Trouble Codes (in Realtime)
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<th>Observation Type</th>
<th>Ind Value</th>
<th>Unit</th>
<th>Conf</th>
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Low Density EDACS Telemetry

- Sensor values recorded at 10sec or 60sec intervals
- Limited number of sensor fields
- Transmitted once every 5 minutes
- Posted real-time online
- Most recent data provided to Clarus
High Density Data Logs

- Internal HDD & USB flash drive
- Raw & interpreted sensor logs
- All sensor fields
- Program & transmission logs
- Up to 5 samples/s stored
- Approx. 500-700 MB/month
- Retrieved infrequently (monthly)
- Posted online
Lessons Learned

• Proprietary nature of OBD/CanBus data
• High equipment/radio costs
• Data transmission limitations via EDACS radio
Value to Being “Connected”

- Real-time data will improve maintenance decisions via MDSS, MMS and in-vehicle info
- Increase reliability & mobility for drivers
- Increase efficiency
- Reduce roadway operating & maintenance costs
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