Michigan DOT
Wx-TINFO Project

ITS T3 Webinar

Using Mobile Data for Weather Responsive Traffic Management

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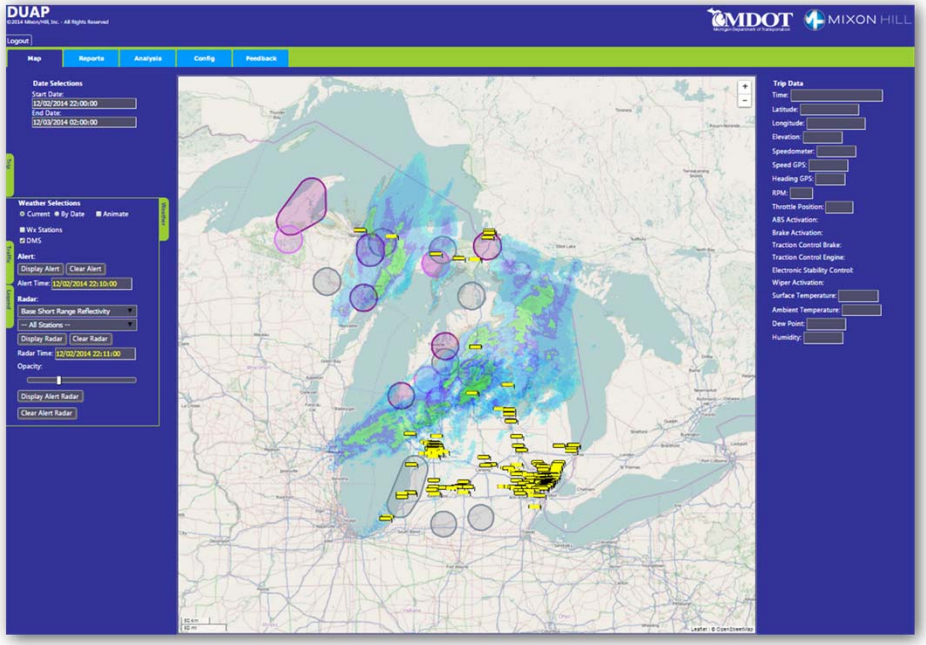
Michigan DOT

Wx-TINFO PRESENTATION OVERVIEW

- Project Scope
- System Architecture
- Data Sources – Fixed, Mobile
- Decision Tree Development
- DMS Message Structure
- System Screenshots
- Project Challenges
- Future CV Opportunities



Wx-TINFO PROJECT SCOPE

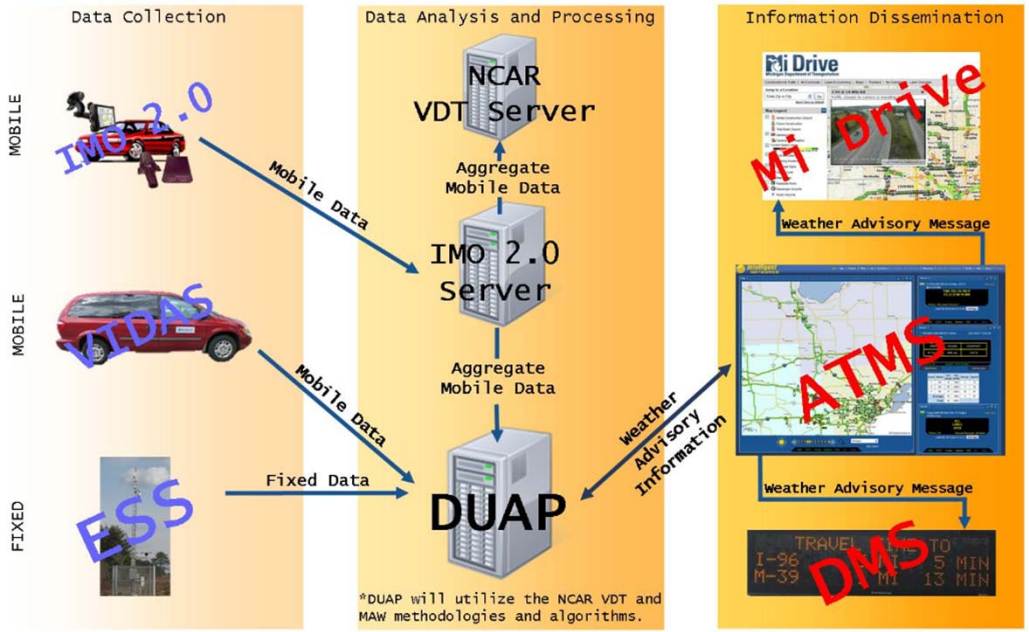
- The purpose of the Wx-TINFO Project is to design a system that brings together near-time environmental/weather-related data collected from both fixed and mobile data sources

- The information is made available to the traveling public via MDOT's ATMS roadside dynamic message signs (DMS) and the Mi Drive traveler info website (http://www.michigan.gov/drive/)

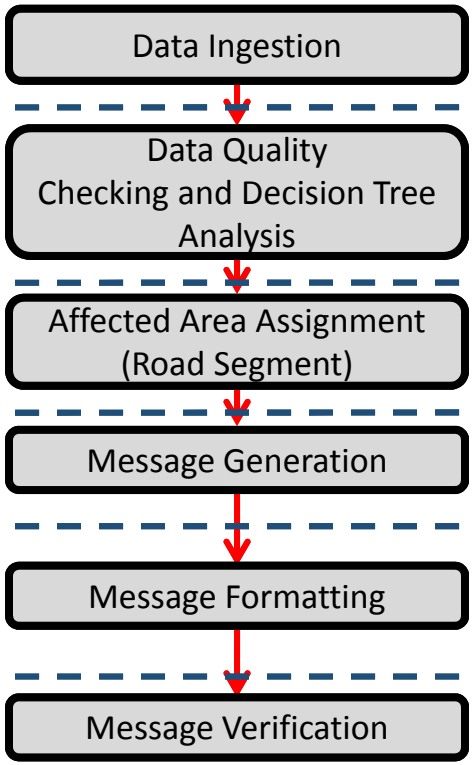
- Wx-TINFO data can also be consumed by other applications

Wx-TINFO SYSTEM ARCHITECTURE

- Data Collection
- Data Ingestion
- Quality Checking
- Data Processing
- Data Analysis
- Info Dissemination



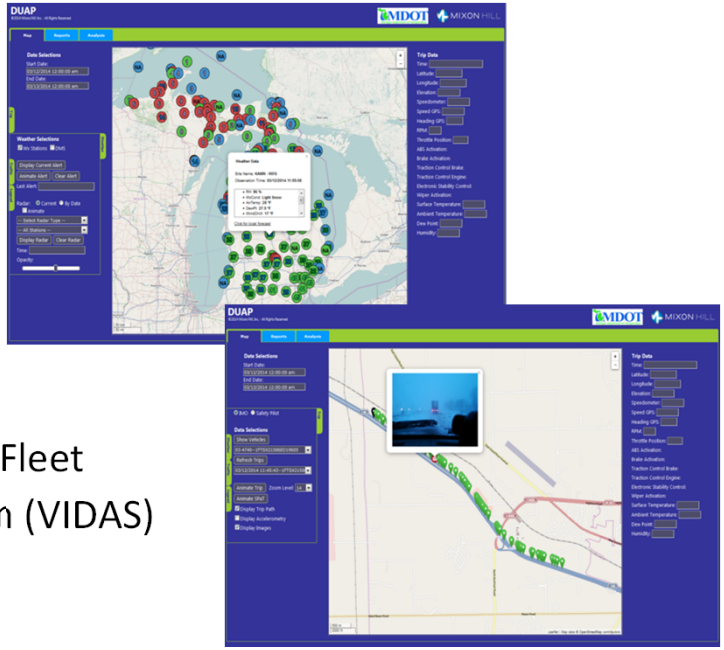
WX-TINFO PROCESS OVERVIEW



1. Data will be leveraged from multiple fixed and mobile sources to provide a broader picture of weather conditions
2. Processes and algorithms to perform quality checking and data analysis are executed to uncover pertinent weather information, ensure validity and accuracy, and utilize decision trees
3. Metadata from the raw data is analyzed, and the information is associated with an affected roadway segment
4. Based on the information from the QC algorithms, the appropriate message is generated
5. The messages are formatted according to the media for communication, including image formatting, text formatting, or other interfaces
6. Message is verified and posted to the appropriate DMS, and Mi Drive Website

WX-TINFO WEATHER DATA SOURCES

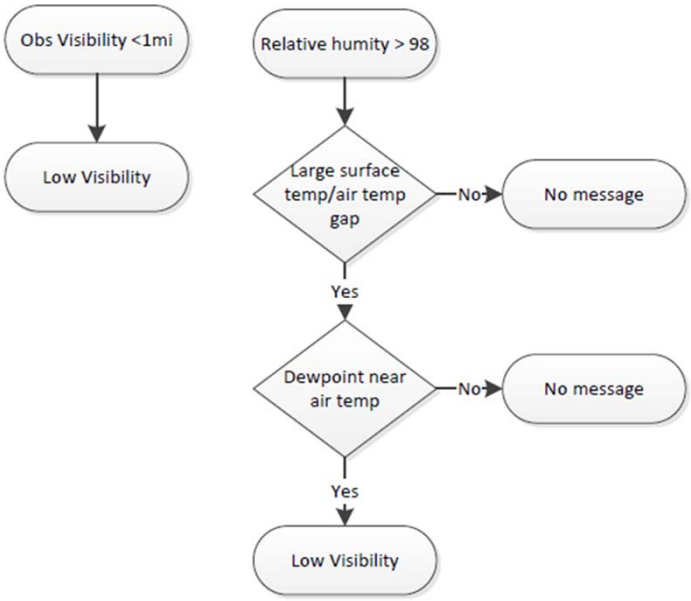
- Fixed
  - Environment Sensor Stations (ESS)
  - National Weather Service (NWS) Stations
  - NWS Radar
  - NWS Warnings (text)



- Mobile
  - Integrated Mobile Observations (IMO) Project Fleet
  - Vehicle-Based Info and Data Acquisition System (VIDAS)
  - Safety Pilot Model Deployment Project Fleet
  - MDOT Snowplow AVL Fleet

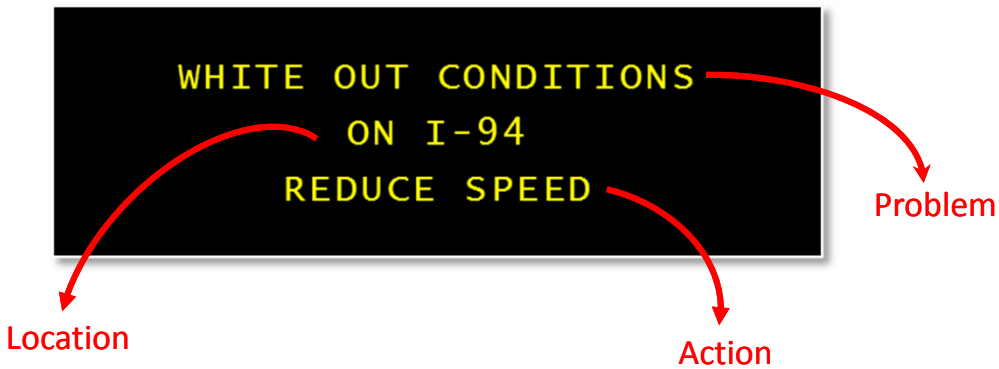
WX-TINFO DECISION TREES

- Precipitation
  - Light/Moderate Rain
  - Heavy Rain
  - Light/Moderate Freezing Precip
  - Heavy Freezing Precipitation
  - Blizzard Conditions
- Icy Roads
- Low Visibility
- NWS Warning/Watch



BASIC DMS MESSAGE STRUCTURE

- PLA DMS Message Structure
  - Problem: Provides information about the situation for the driver
  - Location: Describes the location or the distance to the situation
  - Action: A recommended response or action to the driver



SAMPLE Wx-TINFO MESSAGES

- White Out Conditions

```
WHITE OUT CONDITIONS
ON I-94
REDUCE SPEED
```

- Icy Roads

```
SLIPPERY ROADS
WB I-94
REDUCE SPEED
```

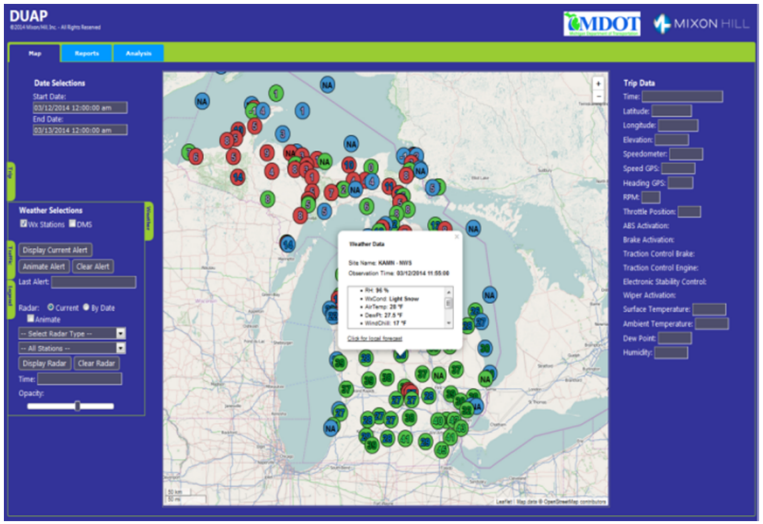
- Tornado Warning

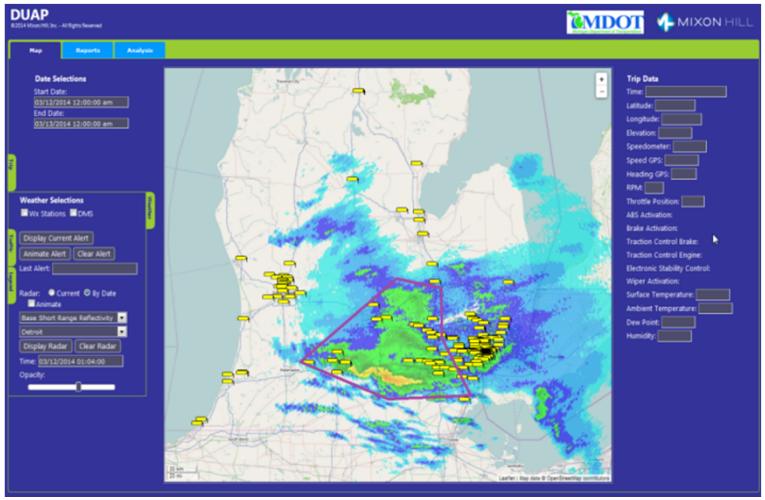
```
TORNADO WARNING
INGHAM COUNTY
8:00 – 10:00 AM
```

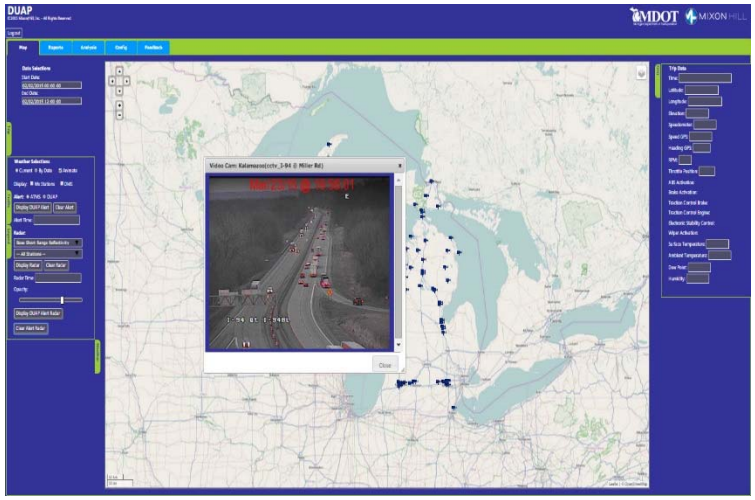
- Low Visibility

```
LOW VISIBILITY
NEXT 5 MI
REDUCE SPEED
```

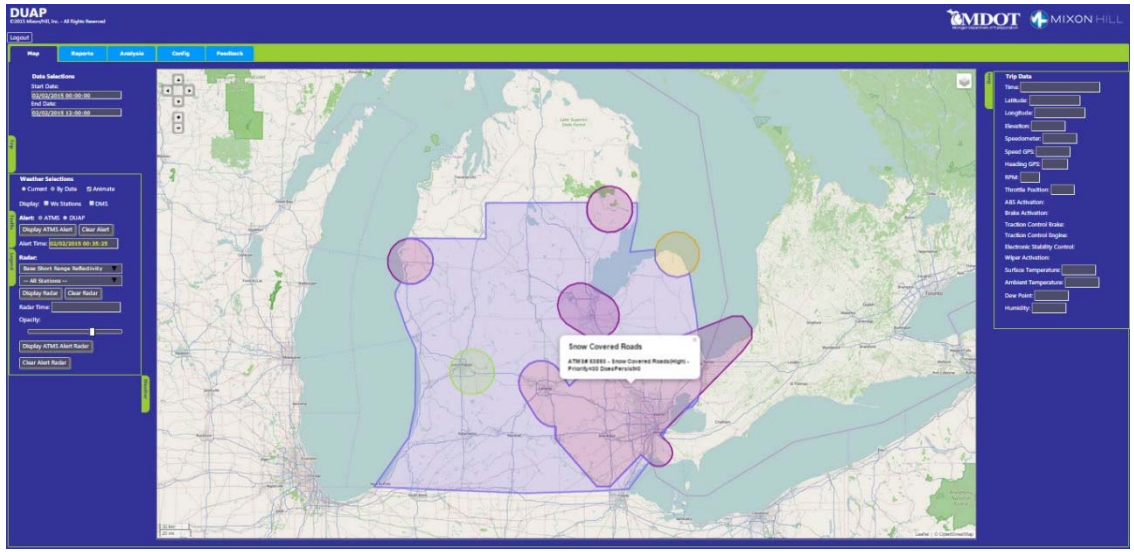
SAMPLE WX-TINFO DATA

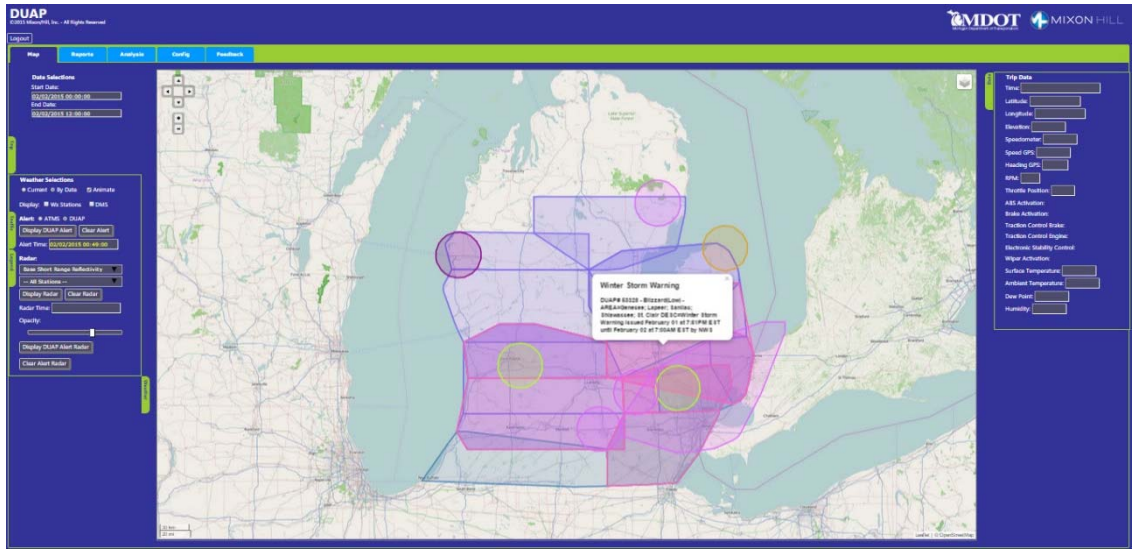






SAMPLE WX-TINFO EVENTS



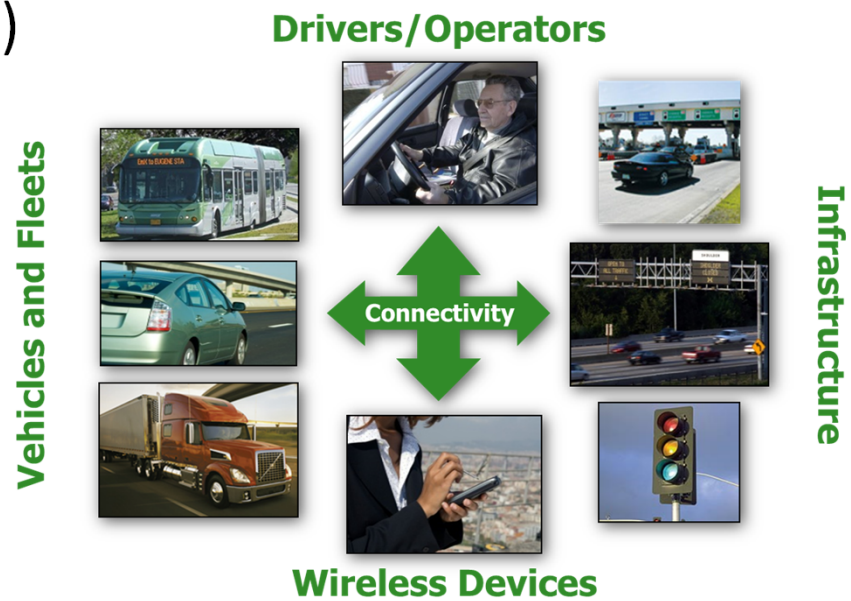


WX-TINFO PROJECT CHALLENGES

- Level of Operational Effort
- Data Latency/Lack of Data
- Changing Affected Areas (Polygons)
- Alert Priorities
- Precipitation Changes
- Forecasting
- System Tuning

WX-TINFO FUTURE CV OPPORTUNITIES

- Connected Vehicles (CV)
- Vehicle-to-Infrastructure (V2I)
  - Weather Applications
- SE Michigan CV Deployment



Questions

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