



What Storms May Come

*Integrating predictive weather information
into public traveler information systems*

2016 National Rural ITS Conference
Monday, October 3, 2016
Chattanooga, TN

predictive weather models:
enhancing public condition reporting

Minnesota Department of Transportation
Maintenance Decision Support System
(MDSS)

Idaho Transportation Department
NWS National Digital Forecast Database
(NDFD)

CARS-Segment

manually entered condition reports

Minnesota DOT

Winter Road Reporting

asmi

Show State Map

District 1

Select all

Border

All Areas

District 1

Border

Duluth

Lakes

Range

Shore

South

District 2

District 3A

District 3B

District 4

District 6E

District 6W

District 7

District 8

Metro

Name/ID	Conditions	Update Time
#1-TP1B0531	Partially Covered Slush	Confirmed: Today, 3:31pm Updated: Tuesday, 1:36pm by mt.brau1kel
#2-TP1B0731	Partially Covered Slush	Confirmed: Today, 3:31pm Updated: Tuesday, 1:36pm by mt.brau1kel
#3-TP1B0012	Partially Covered Slush	Confirmed: Today, 3:31pm Updated: Tuesday, 1:36pm by mt.brau1kel
#4-TP1B0013	Partially Covered Slush	Confirmed: Today, 3:31pm Updated: Tuesday, 1:36pm by mt.brau1kel
#5-TP1B0532	Partially Covered Slush	Confirmed: Today, 3:31pm Updated: Tuesday, 1:36pm by mt.brau1kel
#6-TP1B0061	Partially Covered	Confirmed: Today, 3:31pm

Pavement Coverage

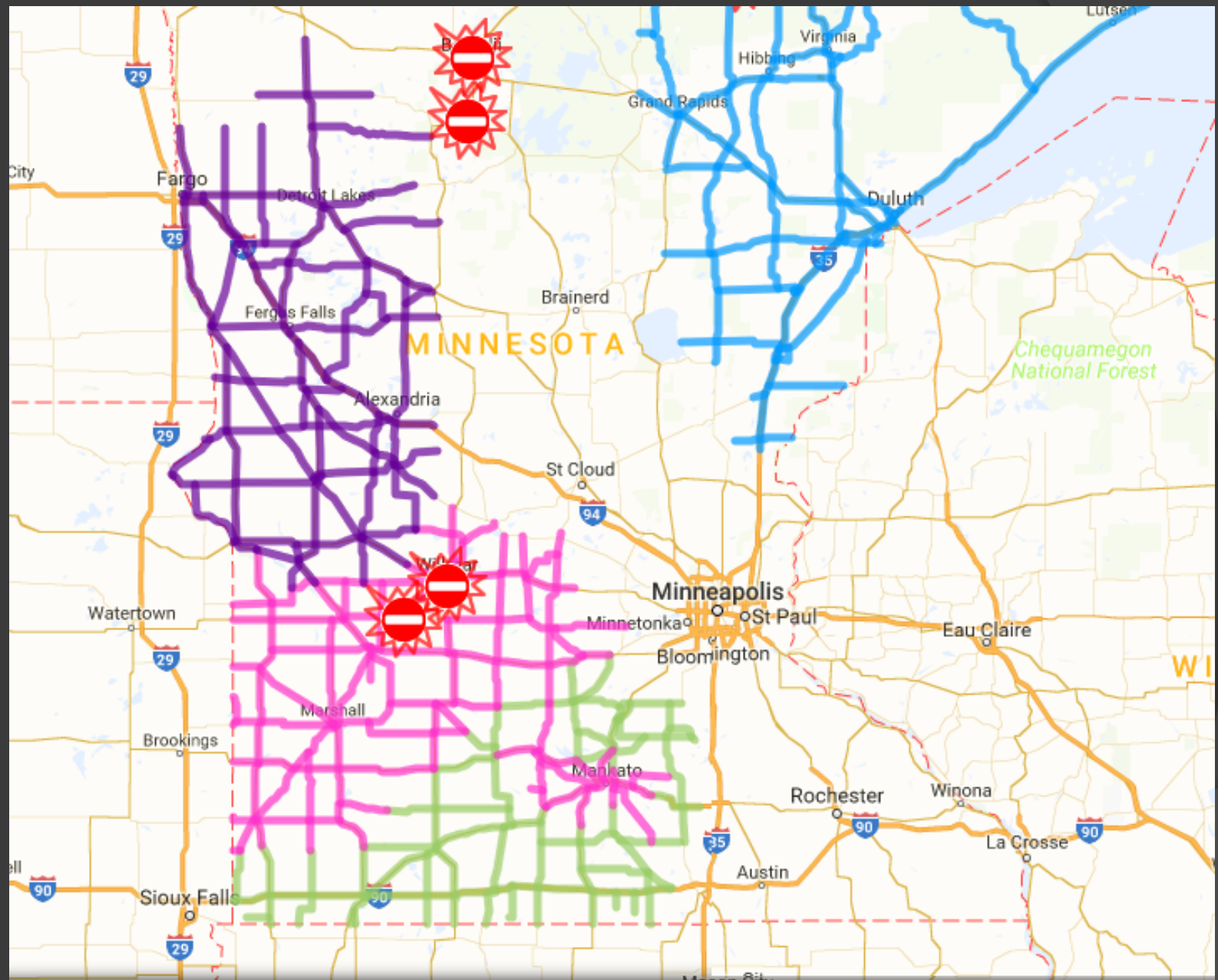
- Select -
- Select -
Normal
Partially Covered
Completely Covered
Travel Not Advised
Closed

Cancel entry

Clear conditions

Update times

Submit

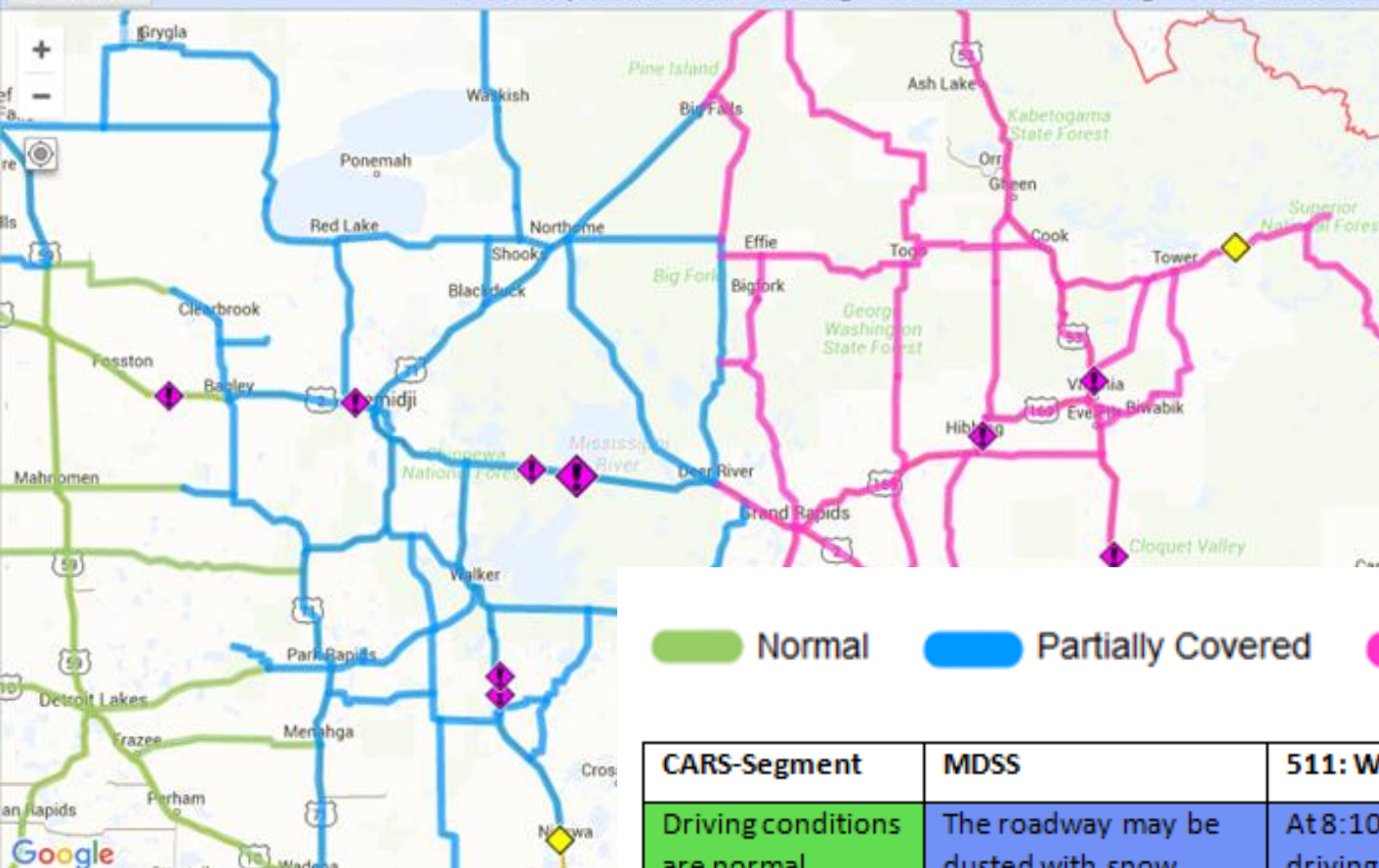


DOT: ■ Normal ■ Partially Covered ■ Completely Covered ■ Travel Not Advised

MDSS

analysis of multi-sourced weather data 24-hour forecasting

- ⦿ National Weather Service (NWS)
- ⦿ Road Weather Information Systems (RWIS)
- ⦿ Automated Weather Observation Systems (AWOS)
- ⦿ AVL-equipped plow data & images



Normal
 Partially Covered
 Completely Covered

CARS-Segment	MDSS	511: Which report is more severe?
Driving conditions are normal.	The roadway may be dusted with snow.	At 8:10 AM, the DOT staff reported that driving conditions are normal. At 9:00 AM, our computers predicted that the roadway may be dusted with snow.
The roadway is completely covered with ice.	There may be icy patches on the roadway.	At 8:10 AM, the DOT staff reported that the roadway is completely covered with ice. At 9:00 AM, our computers predicted that there may be icy patches on the roadway.

improving efficiency & accuracy

integrating manual vs. automated

public road condition reporting

- ⦿ Integrating automated reports with operator-entered conditions
- ⦿ Identifying severity & accuracy
- ⦿ Predictive “trend” analysis:
Can we tell travelers conditions will be getting better or worse?

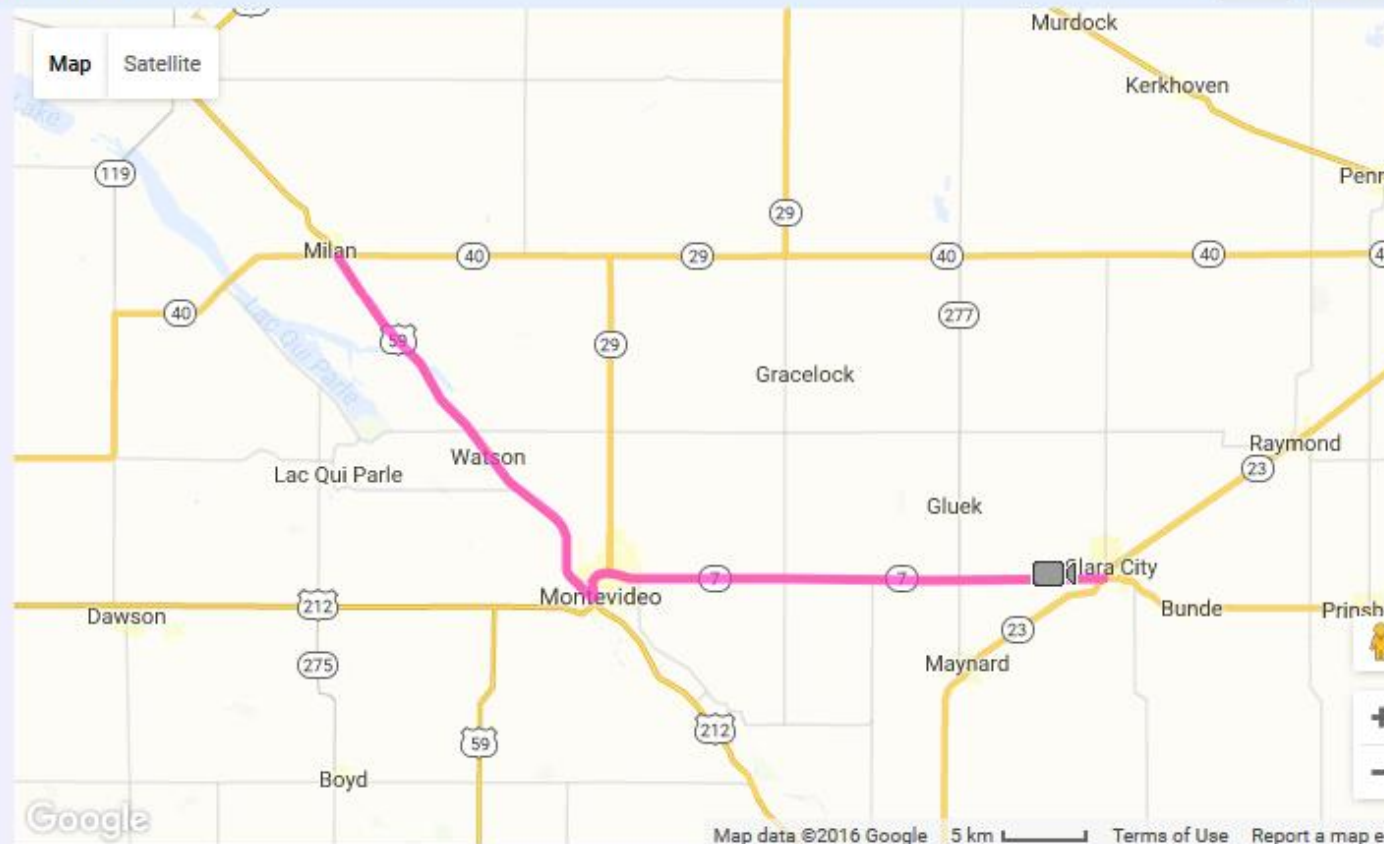
Manually entered TMC Reports

7: Roadway is completely covered with snow.

between MN 40 (Milan) and South Division Street (Clara City). The roadway is completely covered with snow. Look out for drifting snow on the roadway. Expect blowing snow.

Last updated last Tuesday at 3:35 PM CDT by MSP

I have something to say about this report



integrating MDSS data + forecast “trends” are conditions getting *better or worse*?

● US 59: Roadway is completely covered with mixed snow ice or slush.

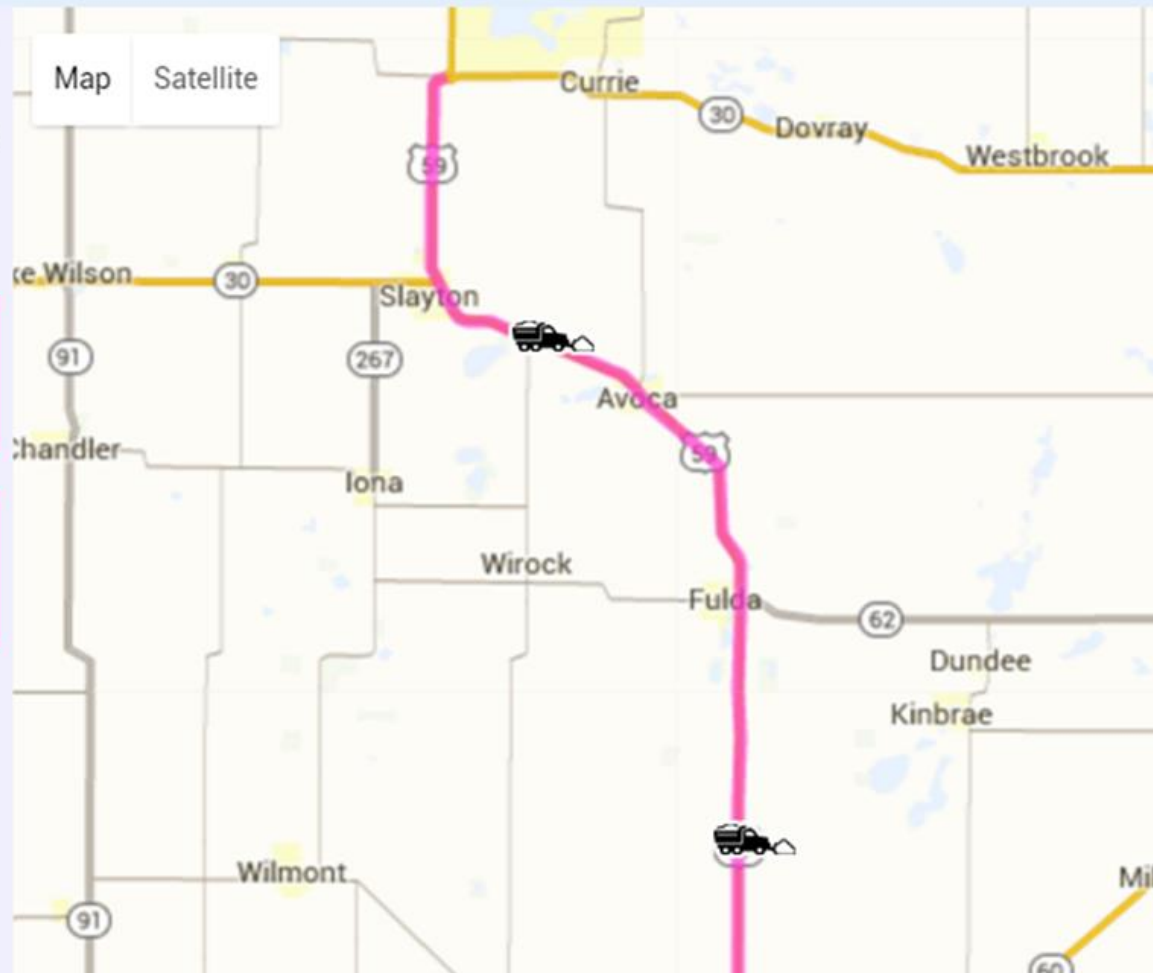
Between MN 60 (Worthington) and MN 30; 156th Street (near Currie). The roadway is completely covered with mixed snow ice or slush. Visibility is reduced. Look out for plowed snow on the roadway.

At 1:35 pm, DOT staff reported that the roadway is completely covered with mixed snow ice or slush.

At 5 pm, our computers predicted that the roadway may be partially covered with slush. Conditions may improve soon.



I have something to say about this report



+ real-time AVL plow info

Roadway is completely covered with mixed snow ice or slush.

N 60 (Worthington) and MN 30; 156th (Currie). The roadway is completely covered with mixed snow ice or slush. Visibility is poor. Look out for plowed snow on the

DOT staff reported that the roadway is completely covered with mixed snow ice or

computers predicted that the roadway may be partially covered with slush. Conditions may improve soon.

[Click here to see something to say about this report](#)

The screenshot displays a Google Maps interface with a 'PLOW CAM' video feed overlaid on the map. The map shows a network of roads including MN 30, MN 91, and I-90, with locations like Worthington, Reading, and Brewster marked. A plow icon is visible on the map near Worthington. The video feed shows a plow clearing a road, with a timestamp 'Today at 1:33 pm MN 59 EB' at the bottom. A secondary video feed in the bottom right corner shows a different road view with a timestamp 'Today at 4:13 pm I-90'.

Map Satellite

PLOW CAM

Today at 1:33 pm MN 59 EB

Today at 4:13 pm I-90

Google Map data ©2016 Google 5 km Terms of Use Report a map error

plow cameras

MN 56 EB: Snow Plow Camera: Today at 1:56 PM



share ▾



Today at 3:23 pm I-80 EB



Today at 3:23 pm I-80 EB



PLOW CAM



Today at 1:33 pm MN 56 EB



Today at 3:23 pm I-80 EB



PLOW CAM



Today at 4:33 pm MN 80 WB



PLOW CAM



Today at 3:23 pm I-80 EB

National Digital Forecast Database (NDFD)

*short-term weather predictions and forecasts:
“nowcasts”*

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  <name>Weather Type, Coverage, and Intensity</name>
  - <weather-conditions>
    - <value coverage="slight chance" intensity="none" weather-type="thunderstorms" qualifier="none">
      <visibility xsi:nil="true"/>
    </value>
    - <value coverage="scattered" intensity="light" additive="and" weather-type="rain showers" qualifier="none">
      <visibility xsi:nil="true"/>
    </value>
  </weather-conditions>
```


Bringing it all together

DOT + MDSS, RWIS Alerts & Citizen Reports

● US 59: Roadway is completely covered with mixed snow ice or slush.

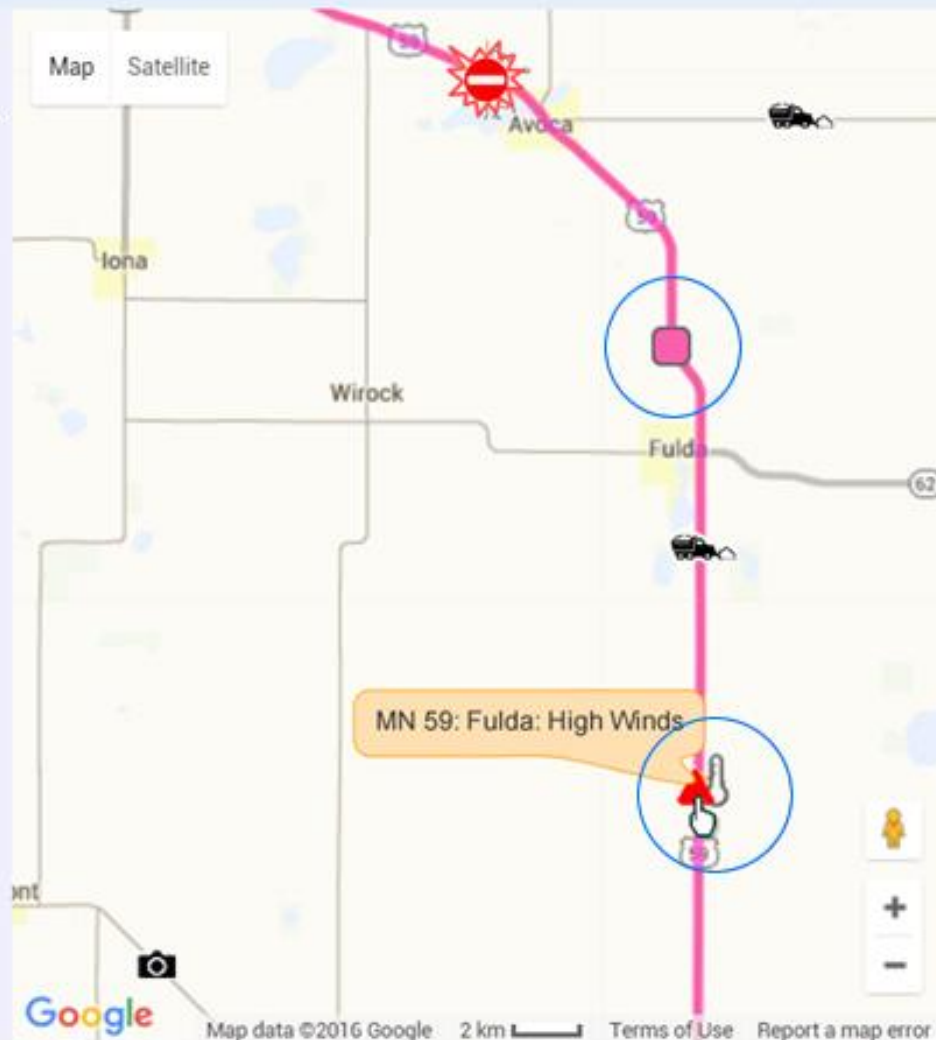
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Questions?

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