



XIII
INTERNATIONAL
WINTER ROAD
CONGRESS

QUÉBEC, FEBRUARY 8 TO 11, 2010



Québec 

SUSTAINABLE WINTER SERVICE FOR ROAD USERS

The Clarus Regional Demonstrations

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US Department of Transportation

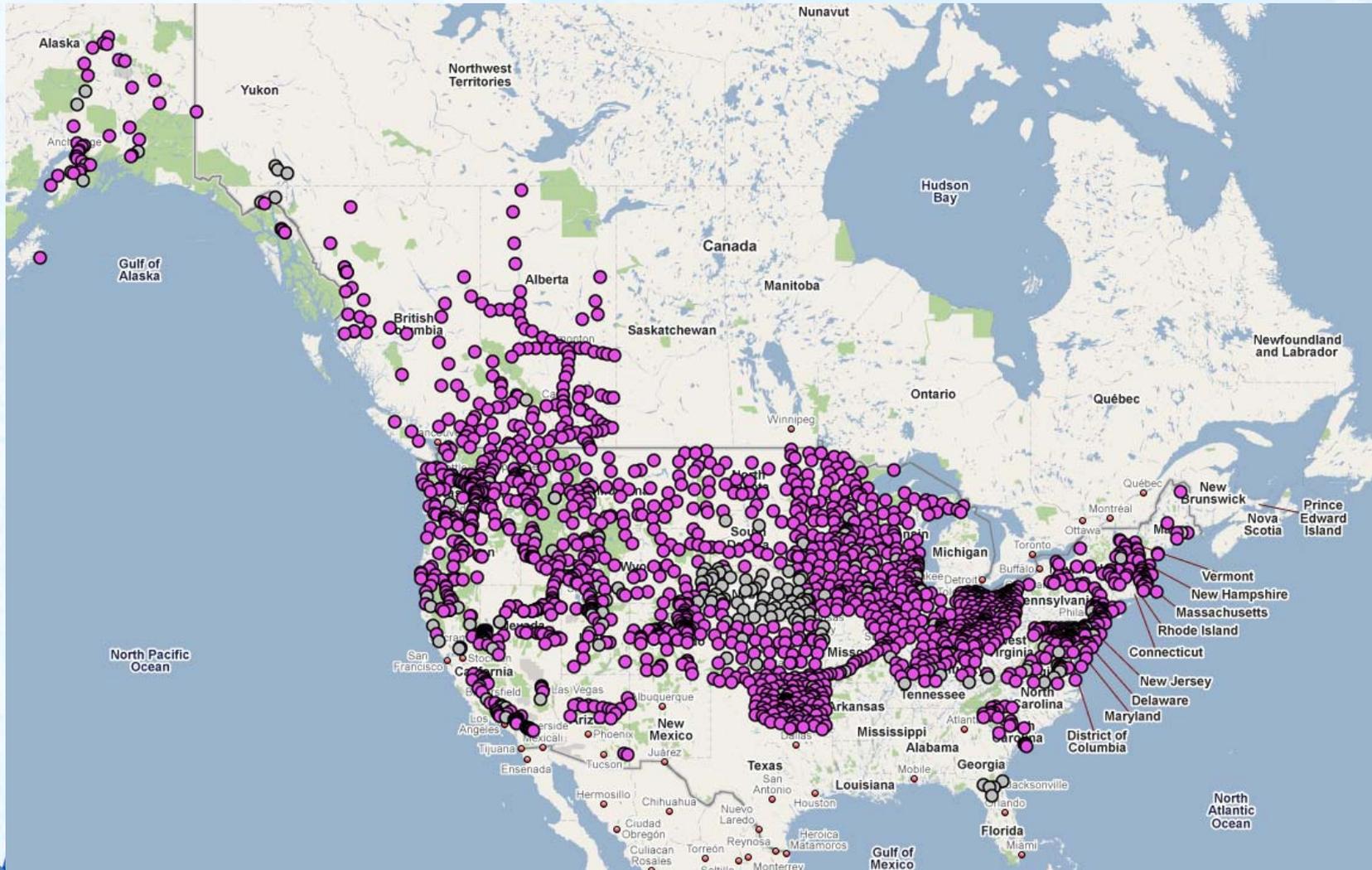
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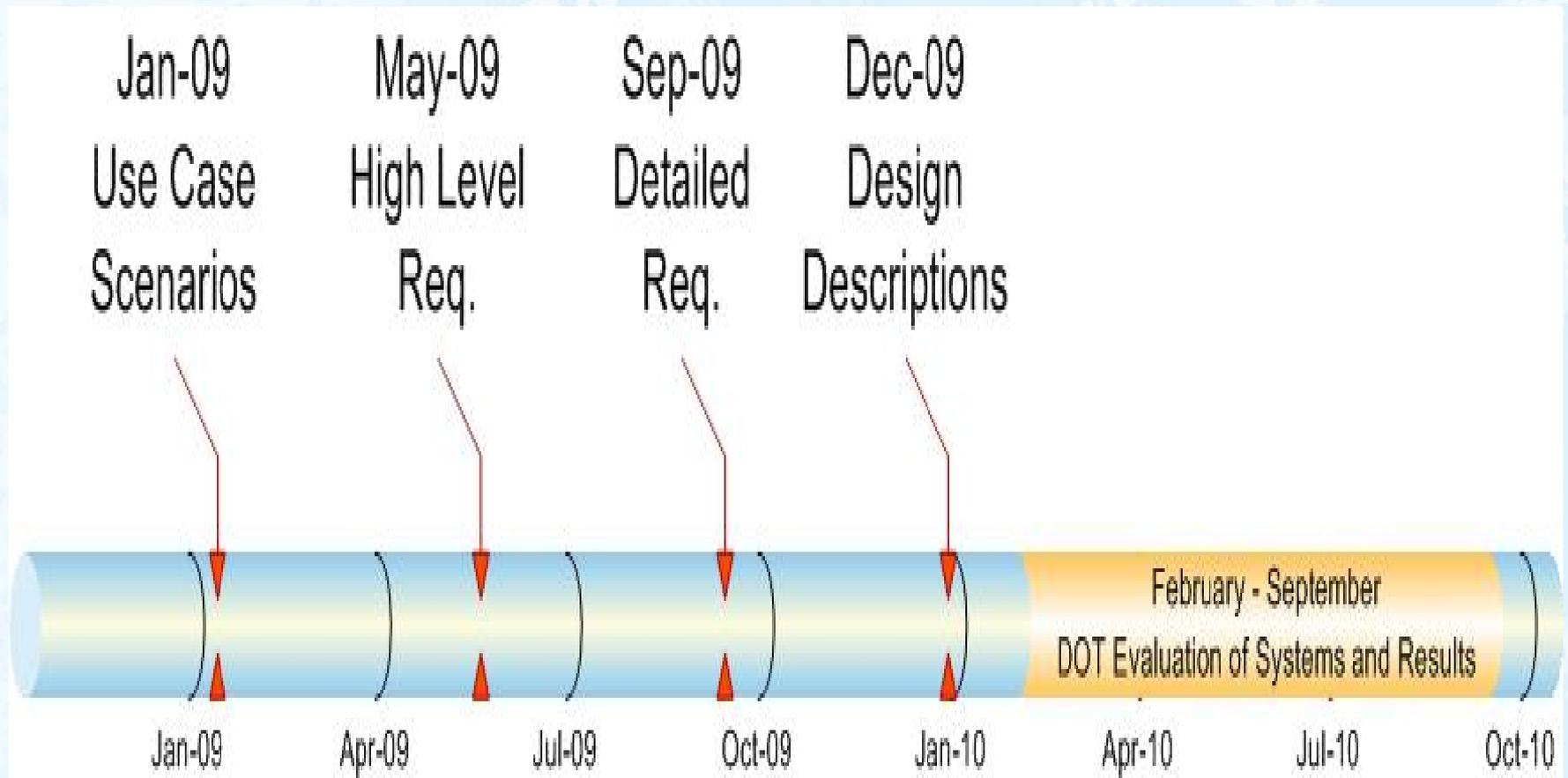
CLARUS: REMOVING BORDERS FOR ESS ACCESS



CLARUS REGIONAL DEMONSTRATION: OBJECTIVES

- Ensure the *Clarus* System works
 - Demonstrate the ability of the *Clarus* System to process and provide data from large numbers of Environmental Sensors Stations (ESS)
 - Promote/educate on metadata collection
- Foster proactive transportation system management
- Encourage improved private sector services for road weather information enabled with data from the *Clarus* System

CLARUS REGIONAL DEMONSTRATION: TIMELINE



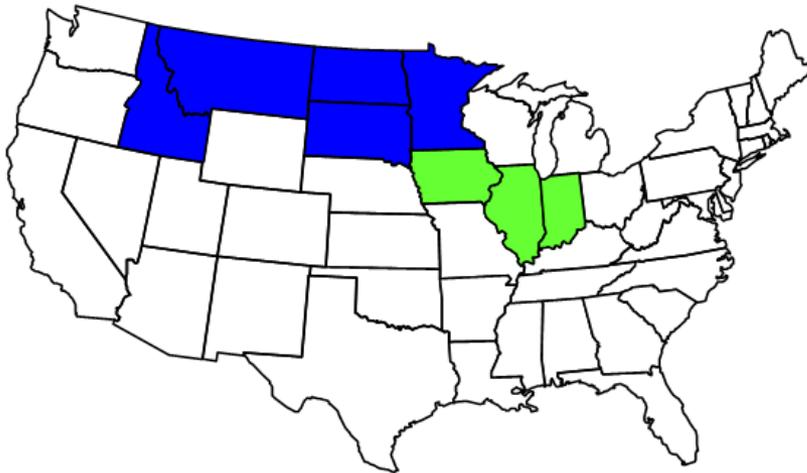
CLARUS REGIONAL DEMONSTRATION: PHASE 3 AWARDS FOR 5 USE CASES

1. Enhanced Road Weather Forecasting Enabled by *Clarus*
2. Seasonal Weight Restriction Decision Support Tool
3. Non-winter Maintenance & Operations Decision Support Tool
4. Multi-state Control Strategy Tool
5. Enhanced Road Weather Content for Traveler Advisories

Meridian team
Scenarios 1, 2, 5

Mixon/Hill team
Scenarios 1, 3, 4

State Transportation Agency Partners



USE CASE 1

Enhanced Road Weather Forecasting Enabled by *Clarus*

- Objective: Assess the impact of *Clarus* data on weather and pavement predictions utilizing existing weather models to enhance forecasting for **local** surface transportation.
- Both teams will use *Clarus* data with the **WRF model (mesoscale prediction model)** to improve initialization fields, data assimilation, forward correction & validation

USE CASE 2

Seasonal Weight Restriction Decision Support Tool

- Objective: Use improved predictions from UC1 & sub-pavement temperature prediction model to create a decision support tool for State DOTs
- Implemented by the **Meridian Team**



Credit WSDOT

- Frost Heave Damage (left)
- Emergency Load Restriction signs in Washington State (right)



USE CASE 2

WEIGHT RESTRICTION DECISION SUPPORT TOOL

Clarus

Multi-State Regional Demonstration

✓ Clarus
Enabled®

- » [Detailed View](#)
- » [State View](#)
- » [Tri-State View](#)
- » [Admin Control](#)
- » [Soil Pictograph](#)
- » [Login Test](#)

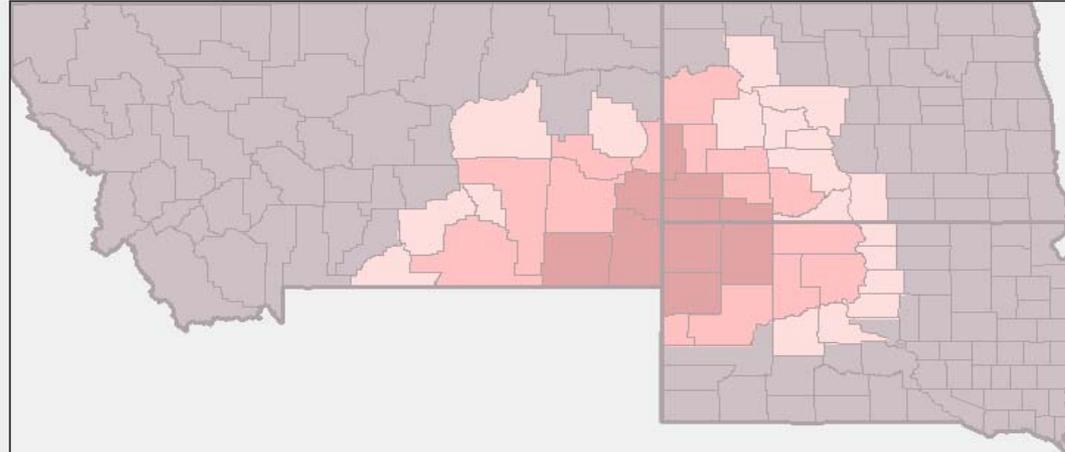
Seasonal Weight Restriction Overview

A tri-state view of active SWR information.

The colored regions on the map below correspond to the active state-imposed Seasonal Weather Restriction; the legend below the map explains which colors respond to which restrictions.

Clicking within the boundaries of any of the three states will direct you to a page containing detailed information pertaining to that site and its active RWIS sensors.

Restriction Legend: Full:  Partial:  Pending:  None: 



UC-2 Screen
Capture

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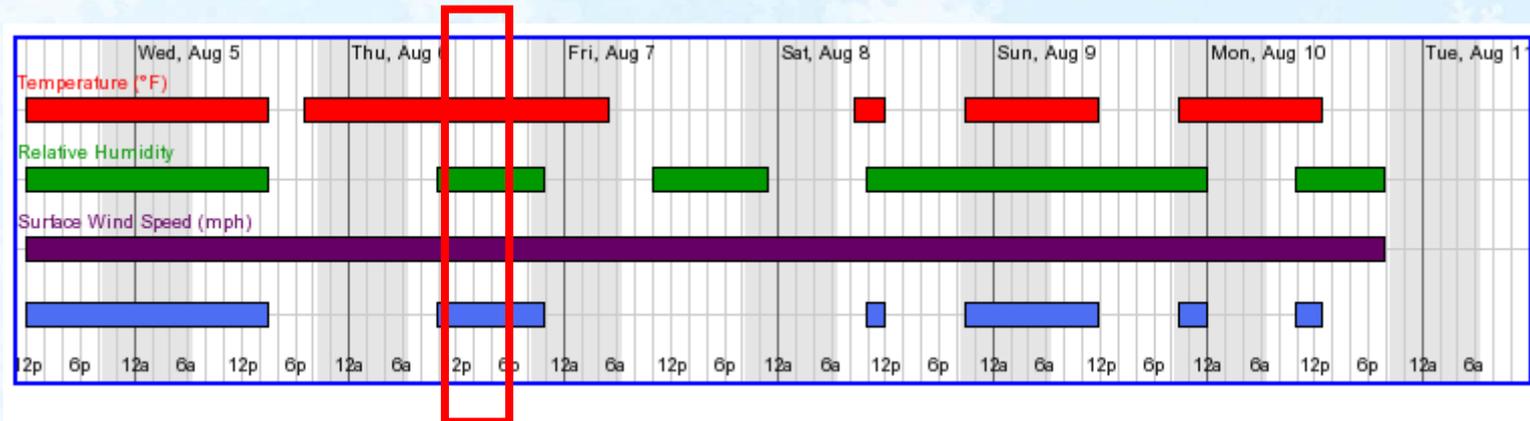
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USE CASE 3

Non-winter Maintenance & Operations Decision Support Tool

- Objective: Expand decision support beyond snow and ice control and incorporate *Clarus* data to assist maintenance, operations, and construction-related scheduling decisions.
- Implemented by the **Mixon/Hill Team**
- Will use *Clarus* data and forecasts from UC1 as input
 - Allows teams of transportation agencies to share and develop new Business-to-Government solutions enabled by *Clarus*

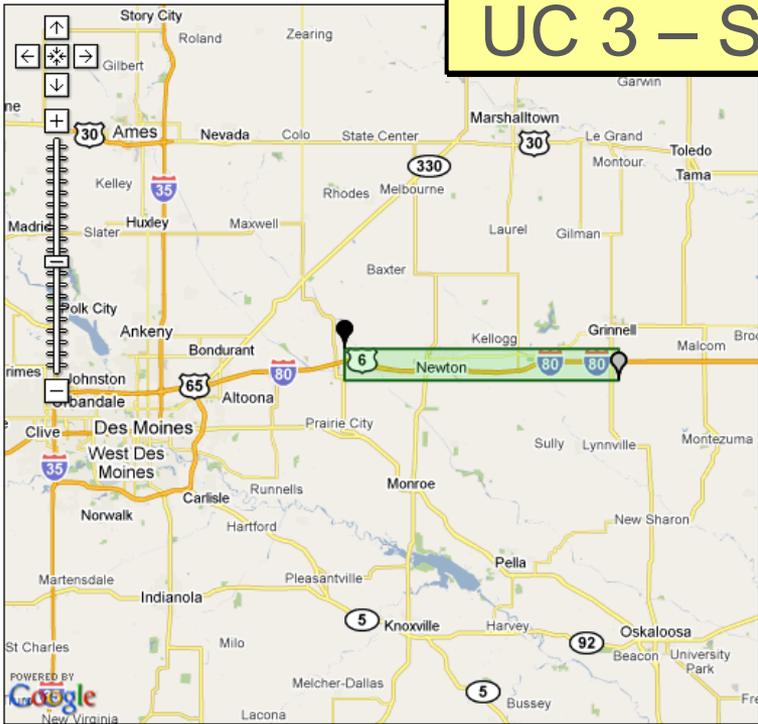
USE CASE 3 – ACTIVITY PLANNER



The System will:

- Analyze weather data based on the weather-related practices established for the activity. (i.e., airTemp > 70)
- Display available times to perform the activity
- Notify users when observations are outside the weather-related practice range
- Give decision makers three options: reschedule activity, cancel activity, or keep original schedule.

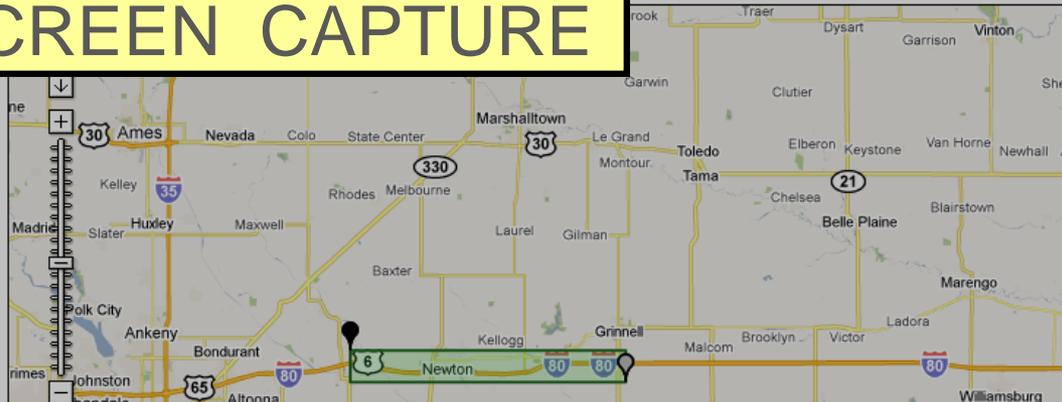
UC 3 – SCREEN CAPTURE



Lat1 Lat2
 Lon1 Lon2
 Location Type Location

Activity Type Group

Plan Description



Modify Practices

Observation Type	Oper	Value	Offset	Start	Duration	Default
Probability of Precipitation (%)	=	0.0	after	0d, 0h	0d, 8h	true
Relative Humidity (%)	<	70.0	before	0d, 1h	0d, 2h	true
Pavement Temperature (F)	<	90.0	before	0d, 1h	0d, 2h	true

Observation Type	Oper	Value	Offset	Offset Start	Offset Duration	Default Result
<input type="text" value="Pavement Temperature (F)"/>	<input type="text" value="<"/>	<input type="text" value="90.0"/>	<input type="text" value="before"/>	<input type="text" value="0d 01h"/>	<input type="text" value="0d 02h"/>	<input type="text" value="true"/>

Plan Description

USE CASE 4

Multi-state Control Strategy Tool

- Objectives:
 - Provide data and strategies which will improve the coordination between agencies to implement controls and disseminate traffic advisories.
 - Assist agencies in proactively responding to situations, allow for timely dissemination of safety information, and thus mitigate the impact to travelers.
- Implemented by the **Mixon/Hill Team**
- Capabilities envisioned in this new tool
 - Enhanced forecasts created in UC1
 - Near real-time *Clarus* data
 - Resulting DOT actions (road closures, active restrictions, incidents, delays, active construction or maintenance)

USE CASE 4 EXAMPLE

View ▾	Conferences ▾	Admin ▾	Scot ▾
New Conference			
Davenport to Omaha		Subscription Status: Active	
Detail I-80 Wind Gusts Davenport to Omaha			
Wilma, CTO Coordinator		12/09/2009 16:43	
Motor Carrier Services Personnel: notify trucking companies of high wind advisory.			
Illinois/Indiana Border		Subscription Status: Active	
Detail I-70 accidents near IL/IN border			
Barney, Traveler Information		12/09/2009 16:45	
Accident information posted to DMS and HAR, as requested.			
Iowa Department of Transportation			

USE CASE 5

Enhanced Road Weather Content for Traveler Advisories

- Objective: Generate value-added, enhanced road weather information (especially pavement condition) for travelers by using *Clarus* data & enhanced forecasts from UC1
- Implemented by the **Meridian Team**
- Capabilities envisioned for this Use Case
 - Decision guide for traveler scenarios will include use of weather
 - Utilize existing 511 Systems in partnering states
 - Traveler advisory information will be aggregated across state boundaries

USE CASE 5 – TRAVELER ADVISORIES

Clarus

✓ Clarus Enabled®



Safe Travel USA

is offered by [Meridian Environmental Technology Inc.](#)

Safe Travel USA

Location: Close

I-94, Valley City-Exit 292 to MN State Line at Fargo

Latest Road Condition Report:

Latest reported road conditions are as follows: good driving conditions between MRM 292 and MRM 314 and between MRM 315 and MRM 352.

Supplemental Road Condition Information:

Roadside sensors indicate snowy or icy conditions may be impacting the roadway.

Weather Forecast:

Skies will be overcast. Visibility will be two miles changing to five miles. There will be occasional light snow changing to scattered very light snow. Winds will be 7 mph from the northeast. Temperatures will range from 4 to 10.

details.
state.

ditions.



[Restore Multi-State Map](#)

REGIONAL DEMONSTRATION EVALUATIONS

- Independent evaluation of the *Clarus* System & developed innovations
 - Two contracts to perform independent evaluations of the Phase 3 innovations
- Evaluation of Use Case 1
 - Scientific/statistical analysis of improvements to surface transportation meteorology & operational forecasting
- Evaluations of Use Cases 2-5
 - Improvements to operations, including tangible versus intangible benefits (mobility, productivity, safety)

CONTACT INFORMATION

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 - Support to FHWA Road Weather Management Program
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Helpful Links:

- » FHWA Road Weather Management: ww.ops.fhwa.dot.gov/weather/index.asp
- » *Clarus* Initiative Site: www.clarusinitiative.org
- » *Clarus* Web Portal: www.clarus-system.com