USDOT Applications Utilizing RWIS

Benjamin McKeever, P.E.
Program Manager, Traveler Info & Road Weather
Research & Innovative Technology Administration
U.S. Department of Transportation

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Session C1: RWIS Applications Session 1
Contact: Ben.McKeever@dot.gov, 202-366-4876
Coauthor

- Paul Pisano
  - Team Leader, Road Weather Management
  - Federal Highway Administration
  - Paul.Pisano@dot.gov; 202-366-1301
Agenda

• The Clarus Initiative
• ESS Siting Guidelines
• Maintenance Decision Support System
• Decision Support beyond Snow & Ice
• Summary
Congressional Direction - 5308

- Establish a Road Weather R&D program:
  - Follow NRC report, *Where the Weather Meets the Road*
  - Promote Technology Transfer
  - Expand Research & Development

- Multi-disciplinary stakeholder input:
  - Natl. Oceanic & Atmospheric Administration
  - National Science Foundation
  - AASHTO & State Departments of Transportation
  - Private sector
  - Non-profit orgs.

- Funding: $5m/yr for 4 years (FY06-09)
Our Vision of Success

Improve Mobility, Safety and Productivity by alleviating the impacts of adverse weather on the surface transportation system

The culmination of this program will result in:

“Anytime, Anywhere Road Weather Information”
The Clarus Initiative

• R&D initiative to demonstrate and evaluate the value of “Anytime, Anywhere Road Weather Information”
• To do so, we created a robust system that provides
  o data assimilation,
  o advanced quality checking, and
  o data dissemination

of real-time atmospheric and pavement observations from the collective states’ environmental sensor stations (ESS).
ESS Deployment

ESS owned by State Transportation Agencies
An Environmental Sensor Station (ESS) is any site with sensors measuring atmospheric conditions, pavement conditions, and/or water level conditions.

Prepared by Noblis for the FHWA Road Weather Management Program, 06/08

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**Clarus System Data Flows**

The Clarus System is a nationwide data management system for surface transportation environmental & pavement condition observations. It includes the following services:

- **Collector Services**
- **Quality Checking**
- **Web Portal**

The system processes data from various sources, including:

- **State DOT RWIS Server**
- **Environment Canada RWIN Server**
- **State DOT GPS/AVL**
- **VII Probe-Based Data**

Data flows through the system in the following stages:

1. **7 Day Data Cache**
2. **Metadata Cache**
3. **Observations**
4. **Metadata**
5. **Quality Flags**

The diagram visualizes the integration of these components, demonstrating how data is collected, processed, and managed across various transportation networks.
Status Today

Participation Status for Clarus

Color Key
- Connected to Clarus (18) (light green=Partially Connected)
- Pending Connection
- Considering Connection

Local DOT Participation
- City of Indianapolis
- McHenry County, IL
- NY State Thruway

Canadian RWIN Participation
Clarus Web Portal

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## Clarus Quality Checking

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<th>Observation Type</th>
<th>Value</th>
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**Clarus Regional Demonstration**

- **Objectives**
  - ensure the system works as designed
  - encourage private sector services that use *Clarus* data

- **Phase 1: Request for Applications (RFA)**
  - Creation of ConOps tailored to agencies’ needs

- **Phase 2: Connection Incentive Program (CIP)**

- **Phase 3: Request for Proposals (RFP)**
  - Private sector to build & test ConOps scenarios
Regional Demonstration - Phase 3

- 2-year project (FY09-10)
- Develop & deploy *Clarus*-enabled services
- 5 use case scenarios included in the RFP
  - Surface transportation meteorology
  - Decision support tools
  - Control & advisory strategies
- Independent Evaluation
ESS Siting Guidelines

- 1st Edition Completed in 2005
- Available electronically at ops.fhwa.dot.gov/publications/ess05/
- Should be considered recommendations not standards
- Based on expert input
- Objectives:
  - Encourage uniform siting criteria
  - Maximize investment in ESS
  - Provide instructions for how to select sensors for an ESS
  - Provide guidance on appropriate locations for ESS and sensors on the ESS
Updates in 2nd Edition

- Discussion of bridge anti-icing systems
- New section on “How to use this guide”
- Description of how the guide fits the systems engineering of ESS deployments and the National ITS Architecture
- New sensor designs and discussion of integration with other ITS
- Information about the Clarus Initiative
- Will be available on FHWA web site soon!
Maintenance Decision Support System

- **MDSS combines:**
  - Current road conditions
  - Advanced (high resolution) weather and road condition forecasts
  - Maintenance rules of practice
- **MDSS generates winter maintenance treatment recommendations on a route-by-route basis**
  - What materials?
  - How much?
  - When?
- **Turns complex road weather information into transportation-based decisions**
  - Easily understandable to transportation community
- **MDSS v5.0 was released in early 2008**
MDSS Regional Display
Introducing MODSS

• MODSS = Maintenance & Operations Decision Support System
• Leverages lessons learned & software developed for MDSS
• Expands DSS functionality beyond snow & ice control to other areas of transportation maintenance & operations
MODSS: Maintenance Activities

Weather Observations & Forecasts
- Air Temperature
- Pavement Temperature
- Wind Speed/Gusts
- Wind Direction
- Rain Chances
- Rain Amount
- Lightning Location
- Relative Humidity

Maintenance Applications
- Chip Sealing
- Patching
- Striping
- Seal Coating
- Pesticide Application & Spraying
- Mowing
- Sweeping/Cleaning
Summary

• USDOT’s Road Weather Management Program seeks to improve mobility & safety on the nation’s roads by
  - Investing in basic research to solve complex weather and pavement issues
  - Providing training and new tools to public transportation agencies, and
  - Supporting the growing surface transportation weather enterprise to continuously improve products & services
Contact Information

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