Weather Data Environment Update
August 12-14, 2014
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Purpose of the WxDE

The purpose of the Weather Data Environment (WxDE) is to provide a data and interoperability platform to meet the weather-related research needs of the community, especially for Intelligent Transportation Systems.
The WxDE Builds on the *Clarus System*

- The *Clarus System*:
  - Assimilated and provided access to road weather data from a network of fixed stations from across the nation, i.e., a weather mesonet
  - Performed quality checks on the road weather data and made the resulting information available
  - Grew to serve state and local transportation agencies, academic researchers, and meteorological information service providers (Wx forecasters)

- The *Clarus System* is being incorporated into the Final MADIS Operating Environment at NOAA
The WxDE Integrates with the Research Data Exchange (RDE)

• The Research Data Exchange:
  - USDOT C-V Data Clearinghouse
  - Collects and archives transportation data from a variety of sources
  - Compiles metadata describing all RDE data
  - Provides access to data and metadata to registered users

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The WxDE Incorporates the Vehicle Data Translator (VDT)

- The Vehicle Data Translator:
  - Reads data from input files that contain
    - Weather data from mobile sources
    - Weather data from RWIS sources
    - Road segment definitions
    - Contextual data such as radar, RTMA and METAR
  - Performs quality checks on mobile data and makes quality checked data available
  - Computes value-added forms of the collected data (road segment-specific pavement and atmospheric condition characterization) and makes the value-added data available
Improvements over *Clarus*...

- Enhanced Data Management
- Re-engineered Core Processing and Infrastructure
- Improved Metadata Discovery
- Enhanced Data Quality Checking
- **Data Archiving Ability**
- Services to Manage all Access to WxDE Data
- Federates with the RDE
- User Interface (maps, queries, subscriptions, metadata, data display, feedback, bug fixes...)
- **Additional data-set providers (WxTelematics)**
- **Historical Data Query Interface**
- Administrative & User Management Capability
- **Usage Analytics**
- Data Source Monitoring
- Integrates VDT Functionality
What you see after you log in...

The Weather Data Environment (WxDE) is a research project that collects and shares transportation-related weather data, with a particular focus on weather data related to connected vehicle applications. The WxDE collects data in real-time from both fixed environmental sensor stations and mobile sources. The WxDE computes value-added enhancements to this data, such as by computing quality check values for observed data and computing inferred weather parameters from vehicle data (e.g., inferring precipitation based on windshield wiper activation). The WxDE archives both collected and computed data. The WxDE supports subscriptions for access to real-time data in near real generated by individual weather-related connected vehicle projects.

The WxDE is weather-specific adjunct to the Data Capture and Management (DCM) Research Data Exchange and, as such, is to provide weather data-related services that support the development, testing, and demonstration of multi-modal transportation mobility applications being pursued under the USDOT ITS Dynamic Mobility Applications (DMA) Program and other connected vehicle research activities. Data accessible through the WxDE will be well-documented and freely available to the public. (Registration and approval may be required to access some data if the original provider of the data places restrictions on its distribution by the WxDE.) The vision of the DCM Program is to enhance current operational practices and transform future transportation systems management through the active acquisition and systematic provision of integrated data from infrastructure, vehicles, and travelers. This data is available to researchers, application developers, and others.

Most information is available to all site visitors. Registered users are provided with some additional capabilities, such as creating data subscriptions and accessing data for which the original provider placed restrictions on its distribution by the WxDE.
- Introductory page shows data coverage extent
- Alert on state with data collection problem
- Quick summary of collection status of highlighted state

Data Map

The Prototype Weather Data Environment is an experimental product being used for evaluation and demonstration purposes only. This is provided as a public service.

No warranties on accuracy of data are intended or provided. See link to contributor’s data disclaimer in our Terms of Use.

Minnesota

- Minnesota Department of Transportation - 2014-04-01 RWTS observations: 43298801, Mobile observations: 37401230
- Google Map display of WxTelematics vehicles
- Integrated display of WxTelematics data
- Google Map display of observation sources
- Integrated display of VDT probe and segment data
- More stylish display of observations than Clarus
- More user friendly display of long list of data
- Three different table displays for WxDE, VDT mobile and segment
- User has option to use improved Clarus Info Window
Enhanced query interface for archived data

Instructions
Specify a start and end date and time for the request.
Embedded Frequently Asked Questions

- **What is the Weather Data Environment (WxDE)?**

  The Weather Data Environment is part of USDOT’s Data Capture and Management Program and associated with the Research Data Exchange. The WxDE is intended to support research, analysis, application development, and testing related to weather responsive transportation management by collecting and distributing weather and weather-related transportation data. There is a particular focus on meeting the evolving weather data needs of connected vehicle applications.

  The WxDE currently collects and distributes data from (a) environmental sensor stations (ESS) that collect weather data at fixed locations and (b) mobile sensor platforms that collect weather data from specially-equipped vehicles as the vehicles operate on roadways. ESS data is available for most U.S. States, and mobile platform data is available from three States participating in USDOT Integrated Mobile Observations (IMO) projects. Data is distributed via maps that provide access to recent observations, queries that allow a user to select and download large batches of data, and subscriptions that allow users to periodically download recently obtained data.
Super-user accessible reports such as collection statistics

*Click column headers containing vertically aligned carets (↑) to sort.

<table>
<thead>
<tr>
<th>CollectionReport</th>
<th>Contributor Name</th>
<th>Last Modified Date</th>
<th>File Size</th>
<th>Download File</th>
</tr>
</thead>
</table>
• API for RDE to query WxDE data availability statistics
• RDE landing page in WxDE for coordinate-based queries
Google Analytics enabled for site traffic analysis
Next Steps…

- Continue to run the system as a research environment until MADIS is fully operational and provides the core functionality of the WxDE
- Incorporate functionality of VDT 4.x
- Various enhancements in user interface, process monitoring, and data hosting/query management
Release Schedule:
- Interim Instance opened for access - July 2013
- Demo Instance (http://wxdedemo.leidoshost.com/) opened for access - Sept 2013
- Production Instance (http://74.254.188.153/) - August 2014 (awaiting conclusion of IRB process). Will be accessible via http://wxde.fhwa.dot.gov/