

USDOT ROAD WEATHER MANAGEMENT PROGRAM UPDATE

<http://www.ops.fhwa.dot.gov/weather/index.asp>

July 2016

The Road Weather Management Program focuses on stakeholder coordination, applied research and technology transfer, performance measurement, training and education. The following material summarizes our current efforts.

- **Weather Savvy Roads - Every Day Counts (EDC-4) Initiative:** Every 2 years, FHWA, through the EDC initiative, works with State DOT's, local governments, private industry and other stakeholders to identify innovative technologies and practices that merit widespread deployment. This year, a new initiative is being launched entitled "Weather Savvy Roads," which includes Pathfinder, the IMO project and related Road Weather technologies (details below). Transportation leaders from across the country will gather at regional summits (see *Upcoming Events* on next page) to discuss and identify opportunities for implementing these technologies to support their Road Weather Management needs. FHWA will provide technical assistance and resources to help agencies implement their chosen innovations, and also will monitor the national state-of-the practice for supporting "Weather Savvy Roads."
- **Road Weather Management and the Connected Vehicle:** The Road Weather Management Team and the ITS JPO continue to develop solutions that use connected vehicles to address road weather problems:
 - The *Vehicle Data Translator* (VDT- aka *PikAlert*[®] System) processes vehicle probe data and turns it into useable weather and road condition observations. Version 4.5 was recently completed; the code and documentation are now available in the USDOT Open Source Application Development Portal (www.itsforge.net).
 - FHWA is working with Michigan, Minnesota, and Nevada DOT on the *Integrated Mobile Observations (IMO)* project to incorporate data from their fleets into the *PikAlert*[®] System and the *Weather Data Environment*. The data are being used as input to various Road Weather Management applications.
 - The Integrated Model for Road Condition Prediction (IMRCP) is a comprehensive travel conditions prediction tool that incorporates transportation and non-transportation data, deterministic and probabilistic data, and measured and reported data continues. A survey of existing predictive models was conducted and a concept of operations was developed for the tool. Requirements for the IMRCP were completed.
 - A pilot deployment project was awarded to a team led by ICF and Wyoming DOT to develop and implement Road Weather Connected Vehicle applications along the I-80 corridor in Wyoming.
- **Road Weather Observations:** Following completion of the *Clarus* Initiative, the FHWA worked with the National Oceanic and Atmospheric Administration (NOAA) to transition the *Clarus* functions to NOAA, as part of the Meteorological Assimilation Data Ingest System (MADIS), <http://madis.noaa.gov/>. Additionally, to support broad RWM research needs, FHWA also developed the Weather Data Environment (<https://wxde.fhwa.dot.gov>); which is currently on version 3.0 and being improved on a continuous basis. The WxDE, which now incorporates functionality of the *PikAlert*[®] System, is part of the ITS program's Research Data Exchange. It provides researchers access to a range of quality-checked road weather observations from both mobile and static platforms.
- **RWIS Environmental Sensor Stations (ESS)**
 - **ESS Siting Guidelines (Version 2.0)** is available electronically: (FHWA-JPO-09-012, NTL ID 30705)
 - **NTCIP 1204 Updates:** NTCIP 1204 v4.0, the Environmental Sensor Station Interface Standard, is nearly complete. A User Comment Draft and a Comment Matrix are available for public comment until 7/12/16.
- **Road Weather Management Regional Roundtables:** The RWMP is conducting Regional Roundtables to help promote coordination across the States in six different regions. The Road Weather Management Exchange is a portal that supports these Roundtables and allows practitioners to share information, technologies and resources (including the NTCIP documents): <https://collaboration.fhwa.dot.gov/dot/fhwa/RWMX/default.aspx>
- **Coordination With Research Consortia and Other entities:**
 - **Clear Roads:** Roadway Salt Best Management Practices guidance was released November 2015.
 - **R&D Strategic Initiative:** 2 projects are underway: Exploring the next generation snowplow visualization-assistance tool and developing guidance on traveler information messages for non-recurring events.
 - **World Road Association (PIARC):** Preparing a technical report that highlights projects around the world that employed innovative ways to collect and utilize mobile data in their winter maintenance functions.

Documents with NTL ID numbers can be accessed at <http://ntlsearch.bts.gov>, then do an advanced search on "NTL Record ID," Title or pub #

- **Weather-Responsive Traffic Management (WRTM):**
 - **Guidelines for Deploying Connected Vehicle-Enabled Weather Responsive Traffic Management –**
This project focuses on existing technologies and practices for collecting and using road weather observations including Connected Vehicle data for WRTM, and developing and implementing guidelines for transportation agencies. A state of the practice review was already completed and an outline was developed.
 - **Mobile Data for WRTM Strategies:** The RWMP completed 3 WRTM projects in Wyoming, South Dakota and Michigan to develop advanced WRTM strategies that utilize road weather data from mobile observations. Existing traveler information and traffic management systems have been enhanced by information received from vehicles and integrated with other weather and traffic data. Final Reports and Flyers were published as follows: Wyoming: [FHWA-JPO-16-266](#) and [271](#), South Dakota [FHWA-JPO-16-269](#) and [325](#), Michigan [FHWA-JPO-16-323](#) and [324](#). Similar work supporting a weather-responsive Active Traffic Management (ATM) System was developed and evaluated in Oregon.
 - **Developments in WRTM Strategies:** Several documents are available to help agencies implement WRTM strategies including: Developments in Weather Responsive Traffic Management Strategies ([FHWA-JPO-11-086](#), [NTL 42965](#)); Utah DOT Weather Responsive Traveler Information System ([FHWA-JPO-13-089](#)) and Weather Responsive Signal Timing ([FHWA-JPO-14-140](#)). We also published guidelines for disseminating advisory and control information pertaining to weather ([FHWA-JPO-12-046](#), [NTL 45623](#)). In addition, a project is underway to develop, test and evaluate analysis, modeling and simulation procedures for road weather connected vehicle DMA and ATDM strategies using Chicago as testbed.
- **Road Weather Management Performance Measures**
 - We have completed and published the 2015 Road Weather Management Performance Measures Report. Forty States responded to the survey on their existing RWM practices and technologies. ([FHWA-HOP-16-001](#)).
 - A compendium of RWM Benefit-Cost Analysis examples was recently published ([FHWA-HOP-14-033](#)). Additional case studies are being developed. A couple of technical briefs have been published recently ([FHWA-HOP-16-005](#) and [FHWA-HOP-16-004](#))
 - The project to develop and demonstrate a Prototype Road Weather Performance Management tool that uses Connected Vehicle data is underway. The prototype tool has been completed and it is being tested in Minnesota. The tool uses mobile traffic and road-weather observations in evaluating how well transportation agencies are performing weather-related traffic management and maintenance activities. The prototype tool code and documentation have been posted in the Open Source Applications Development Portal.
- **Strengthening the Road Weather Management Capabilities of Transportation Agencies.**
 - A *Capability Maturity Framework (CMF)* for Road Weather Management was developed, validated and implemented in 3 State DOT's (Colorado, Idaho, Wyoming). The CMF helps agencies evaluate their capabilities in Road Weather Management, and identify strategies to raise those capability levels. Agencies interested in conducting the CMF workshops should contact the RWMP. An electronic CMF tool can be accessed in: <http://www.ops.fhwa.dot.gov/tsmoframeworktool/tool/rwm/index.htm>
 - The *Pathfinder* project ensures that road users receive consistent and non-conflicting information about weather and road conditions. Information-sharing models between State DOTs, their private sector weather providers, and the National Weather Service have been documented. Four states along the I-80 corridor from California to Wyoming have captured their day-to-day practices, which was turned into guidance on ideal coordination and collaboration. We also recently worked with Georgia DOT to test the draft guidance.
- **Training:** Web-based training courses and Road Weather Management Certificate are offered through the Consortium for ITS Training and Education (CITE) program at University of Maryland:
 - RWM Certificate Program: <http://www.citeconsortium.org/certprograms.html#RW>
 - Road Weather Information System (RWIS) Equipment and Operations (currently underway) <http://www.citeconsortium.org/courses/RWIS.html>
 - Weather Responsive Traffic Management (next delivery : October 2016) <http://www.citeconsortium.org/courses/WRTM.html>
 - Principles and Tools for Road Weather Management (next delivery: May 2017) <http://www.citeconsortium.org/courses/RoadWeatherMgmt.html>
- **Upcoming Events**
 - EDC-4 Summit Meetings: Oct.18-19 (Baltimore), Oct. 25-26 (Minneapolis), Nov. 2-3 (Albany), Nov. 29-30 (Portland), Dec. 1-2 (Sacramento), Dec. 6-7 (Austin), Dec 14-15 (Orlando)

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