Weather Responsive Traffic Management (WRTM)

ROEMER ALFELOR
Federal Highway Administration

RWM Virtual Stakeholder Meeting
August 25, 2015
WRTM Framework

Safety, Mobility and Performance Evaluation

WRTM Strategies

ADVISORY CONTROL TREATMENT

Behavioral/Human Factors Analysis

Traffic and Weather Data Collection and Integration

Traffic Analysis and Modeling Tools
Traffic Analysis and Modeling

- Empirical Studies of Weather and Traffic
  - Speed, Volume, Capacity, Density
- Microscopic Analysis of Traffic in Inclement Weather
  - Car Following, Gap Acceptance, Lane Changing
- Traffic Estimation and Prediction
  - Weather-Sensitive Traffic Estimation and Prediction System (TrEPS)
Traffic/Weather Data Collection and Integration

- Weather Integration in TMC’s
  - TMC Self-Evaluation and Planning Guide
  - Sacramento, Kansas City, CO Springs, Wyoming, Louisiana

- Data Sources for WRTM
  - Data Mining and Gap Analysis for WRTM
  - Application of Mobile Data for WRTM Studies

- Baselining Current Road Weather Information
Human Factors Analysis

- Traveler Requirements for Road Weather Advisory and Control Information
- Guidelines for Disseminating Road Weather Messages
Recent Activities

- 2nd National WRTM Workshop/Stakeholder Meeting, Sept. 2013, Salt Lake City, UT
- Guidelines for VSL Implementation during Wet Weather
- WRTM Webinar Series (NTOC, ITS T3 Program)
- Advanced WRTM Strategies Implementation
  - Citizen Reporting Program (Utah DOT)
  - Traffic Signal Control (Utah DOT)
Current/Future Activities

- **WRTM Implementation Projects**
  - Oregon
  - Michigan
  - Wyoming
  - South Dakota

- **Analysis, Modeling and Simulation Test Beds for RW Connected Vehicle Applications (Chicago, Phoenix)**

- **WRTM Web-based Course (CITE Program)**
  - Sept 2015 (free to transportation agencies)

- **3rd National WRTM Workshop (Oct 20-21, Kansas City, MO)**
Weather Responsive Traffic Management (WRTM) Implementation Projects

Oregon DOT
- Developed and implemented WR ATM System in Oregon (SR 217)
- Implemented Weather-related VSL and DMS’s

Michigan DOT
- Developed and implemented WR Traveler Information System using Fixed and Mobile Road Weather Observations
- Road weather info provided on MiDrive Website and DMS’s

South Dakota DOT
- Used mobile observations from maintenance vehicles to improve traffic and maintenance operations during weather events
- Road weather forecasts on website, 511 and mobile applications

Wyoming DOT
- Used observations from WyDOT plow vehicles to improve condition reporting and traveler information systems
- Road weather info provided on website and DMS’s

All 4 projects already completed and evaluated. Reports forthcoming.
CHICAGO ANALYSIS, MODELING AND SIMULATION (AMS) TESTBED

- One of the 6 Testbed Sites identified to analyze Connected Vehicle DMA and ATDM applications

- The Chicago Testbed is dedicated to testing CV weather-related applications under different weather conditions.

- DMA Applications:
  - INFLO
    - SPD-HARM

- ATDM Strategies:
  - **ATM**: Dynamic Shoulder Lanes, Dynamic Lane Use Control, and Adaptive Traffic Signal Control.
  - **ADM**: Dynamic Routing

Contact: Roemer Alfelor
Road Weather Management Capability Maturity Framework (CMF)

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Capability Maturity Assessment

• A consistent and structured evaluation or assessment of a process

• Guides an agency towards a higher level of implementation, standardization, and return on investment.
  – Incremental actions that build upon existing successes
  – Defines priorities based on clear identification of possible capability improvements
# Operations Capability Areas

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Levels of Maturity

Most Agencies Today

Performed
- Activities & relationships ad hoc
- Champion-driven

Managed
- Processes developing
- Staff training
- Limited accountability

Integrated
- Process documented
- Performance measured
- Organization/partners aligned
- Program budgeted

Optimized
- Performance-based improvement
- Formal program
- Formal partnerships

Goal for the Future
FHWA Program Area CMF’s

- Traffic Incident Management
- Planned Special Events
- Work Zone Management
- Road Weather Management
- Traffic Signal Management
- Traffic Management
RWM CMF Development Team

- **Consultant**
  - Battelle
  - ICF Kaiser
  - TTI
  - HNTB

- **FHWA**
  - Roemer Alfelor
  - Paul Pisano
  - Joe Gregory
  - Jim Hunt
  - Wayne Berman

- **Stakeholders**
  - Jack Stickel (Alaska DOT&PF)
  - Ben Dow (APWA, City of Fargo)
  - Denise Markow (NH DOT)
  - Phil Anderle (CO DOT)
  - Denise Inda (NV DOT)
  - Larry Dunn (Natl Weather Service)
  - Ralph Patterson (Narwhal)
Elements of RWM CMF

• 6 dimensions and 4 levels of capability
• 20 assessment questions related to all dimensions
• Capability levels are determined based on responses
• Approx. 140 improvement actions to move from one level to another in each dimension.
• Choice of actions depends on agency priorities and resources
Online Tool

• RW CMF will be available as a web-based tool on the FHWA Office of Operations website

• The tool allows:
  – Facilitated discussions led by agency
  – Consensus building
  – Prioritization
  – Agency specific action plans
Project Timeline

• July 2014 – Preliminary CMF developed based on discussions with development team
• Aug 2014 – Preliminary CMF presented at RWM Stakeholder Meeting in Salt Lake City
• Dec 2014 – CMF Validation Workshop in Denver, CO
• May-Dec 2015 – National Deployment Workshops
  – Idaho DOT (Sept. 24, 2015)
  – Wyoming DOT (Sept. 29, 2015)
Opportunity for State DOT’s

- FHWA will support in-person workshops where trained facilitators will help the agency step through the framework
- Availability: Starting in late 2015
- If interested, contact: Roemer Alfelor