FHWA Road Weather Program and TSMO365

Roemer Alfelor

FHWA Office of Operations

June 25, 2019

FHWA Road Weather Management Program

- Created in late 1990's as part of Office of Operations
- Goal is minimize impacts of weather on transportation system
- Works with various partners in transportation and weather communities
- Conducts research, development and deployment activities → innovative solutions
- Provides training, technical assistance and peer exchange

Partners

Transportation Community	Weather Community
State DOT's	NOAA National Weather Service
Local Agencies	NOAA Office of Federal Coordinator for Meteorology
Turnpike/Toll Authorities	NWS Forecast Offices
AASHTO Committees/TSP's	American Meteorological Society
TRB Committees	Interdepartmental Committee for Meteorological Services and Supporting Research (ICMSSR)
APWA	
NACE	
Pooled Fund Programs	
PIARC	

FHWA RWMP Role in TSMO COP

- Help understand and mitigate impacts of weather on TSMO, including freight operations
- Support and facilitate integration of weather information in TSMO activities
- Build connection between agency operations and maintenance
- Develop and deploy decision-support tools and innovative solutions for TSMO during weather events
- Provide a forum/venue for collaboration, exchange of information, and dissemination of RWM best practices among TSMO staff

Every Day Counts (EDC) Program

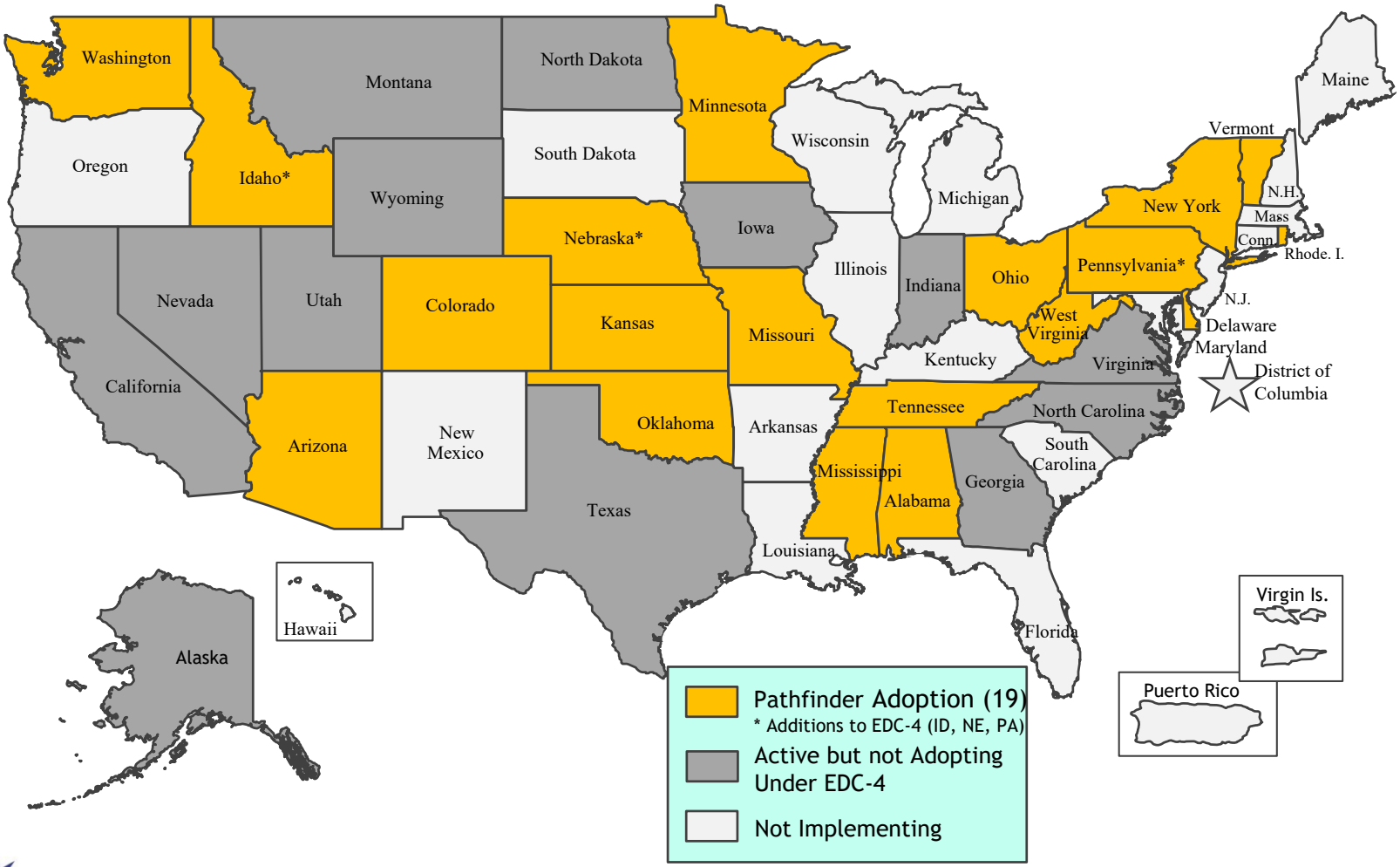
- State-based model to identify and rapidly deploy proven but underutilized innovations to:
  - shorten the project delivery process
  - enhance roadway safety
  - reduce congestion
  - improve environmental sustainability
- EDC Rounds: 2-year cycles
- Currently 5th Round (2019-2020) - 10 innovations
- To date: 4 Rounds, 46 innovations

EDC-4 Pathfinder

- **Collaboration** between the National Weather Service (NWS), State DOTs, and support contractors to share and translate forecasts into consistent public transportation impact messages
- Disseminates road weather information that is:
  - **clear,**
  - **concise,**
  - **consistent, and**
  - **impact-based.**

Intended Outcome - Drivers are well informed and able to make safe and efficient travel decisions

Pathfinder Deployment States



EDC-4 Integrating Mobile Observations (IMO)

Weather and road condition data collection from fleet vehicles for a more comprehensive view of network conditions

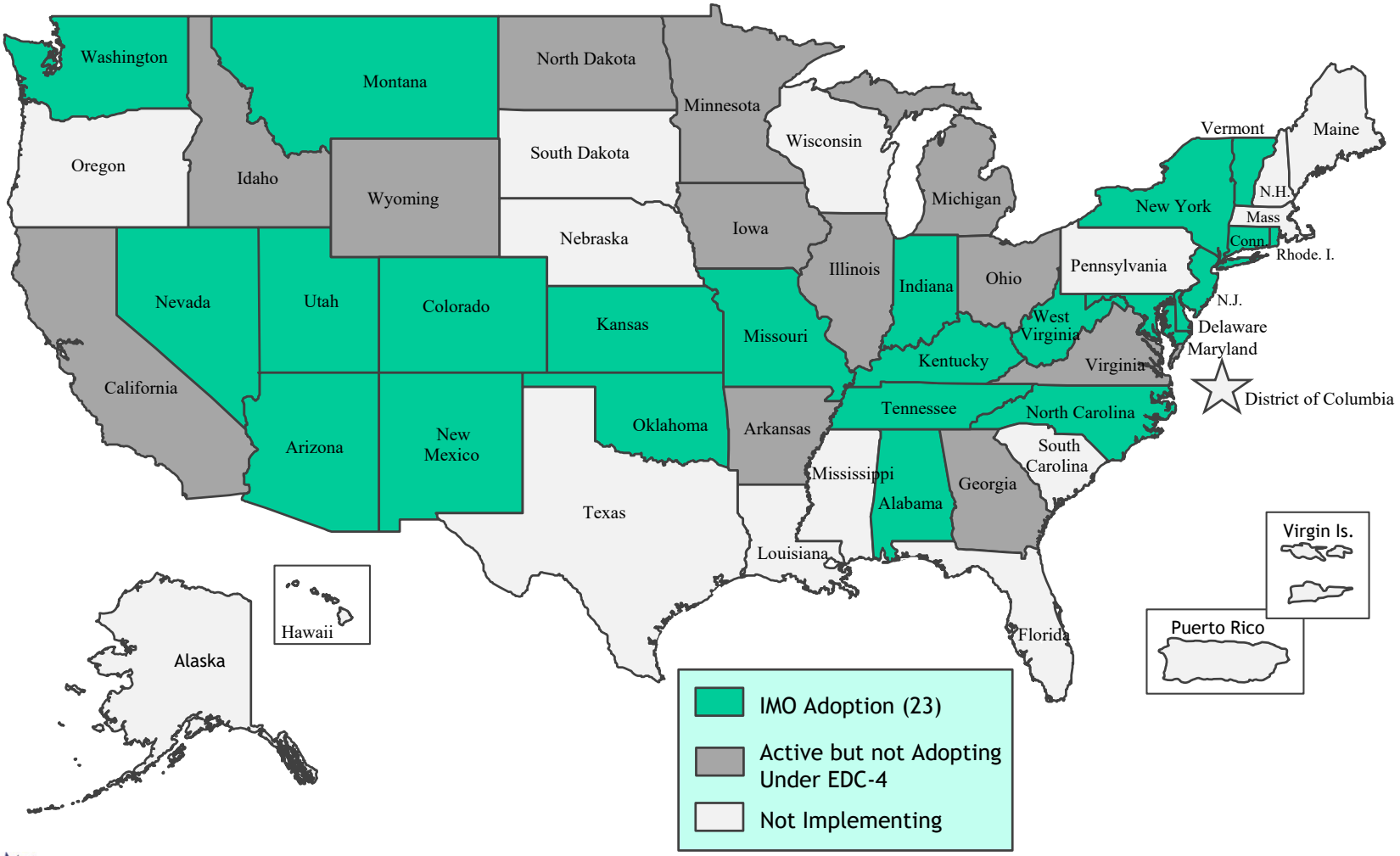
Source: Wyoming DOT

Advanced, vehicle-based technologies are deployed to **collect, transmit,** and **use** weather, road condition, and related vehicle data

Intended Outcome - Utilizing enhanced data for more informed system management

(maintenance, traffic, asset, performance)

IMO Deployment States



EDC-5 Weather Responsive Management Strategies (WRMS)

- One of 10 initiatives selected for 2019-2020
- Focuses on using mobile and connected vehicle data for traffic and maintenance management during weather events
- Includes 2 types of strategies
  - ✓ Traffic Management (Advisory/Control)
  - ✓ Maintenance Management (Winter/Non-Winter)

Source: Nevada DOT

Source: NWS Wyoming

Source: Minnesota DOT

https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/weather_strategies.cfm

WRMS Strategies

- **Traffic Management Strategies**
  - Motorist Advisory and Warning System (i.e. 511, Highway Advisory Radio, Variable/Dynamic Message Sign, Website, Kiosk, In-vehicle application, Smartphone Application)
  - Signal Timing and Ramp Metering
  - Variable Speed Limit
  - Road/Lane Closure
  - Traffic Diversion
  - Vehicle Restriction

Source: Minnesota DOT

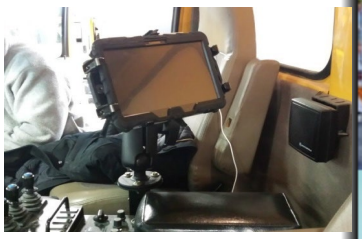
- **Maintenance Management Strategies**
  - Anti-icing and De-icing
  - Plowing and Snow Removal
  - Route Optimization/Vehicle Tracking
  - Debris Removal
  - Water Drainage Maintenance
  - Vegetation Control

Source: Michigan DOT

WRMS Data Sources

- Vehicle-based Road Weather Sensors
  - Friction, Temperature, Precipitation, Snow Depth, etc.
- On-board cameras
- Electronic tablets
- Cell Phones and Personal Digital Assistants (PDA)
- Global Positioning System receivers/AVL Systems
- Vehicle Controller Area Network (CAN) Bus

Source: Nevada DOT

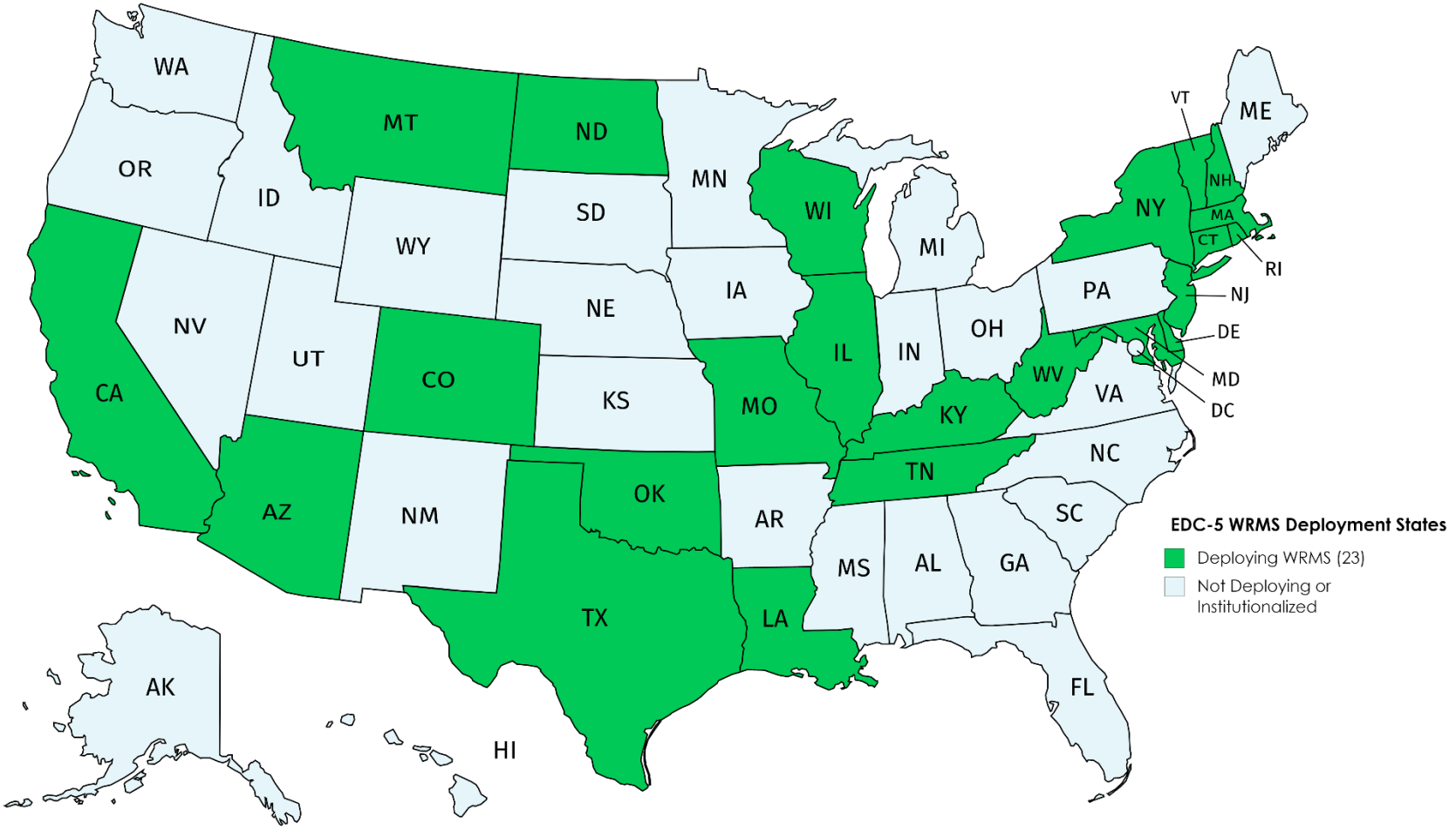


Source: Wyoming DOT

Source: City of West Des Moines, IA

Source: Utah DOT

EDC-5 WRMS Deployment States



RWMP Activities and TSMO365 Priority Areas

	Mobile Road Wx Observations	VSL Systems	Active/Real-Time Warning Systems	Predictive Traffic Condition Modeling
EDC4 Pathfinder			X	X
EDC4 IMO	X		X	
EDC5 WRMS	X	X	X	X
IMRCP	X			X
AMS Implementation	X	X	X	X
CAV and Weather	X			
Road Weather CMF	X	X	X	X
TMC Weather Data Integration	X	X	X	X
Vehicle Data Translator/ Pikalert	X			
Weather Data Environment	X		X	
Road Weather Messaging Guidelines			X	
Road Weather Data Standards	X		X