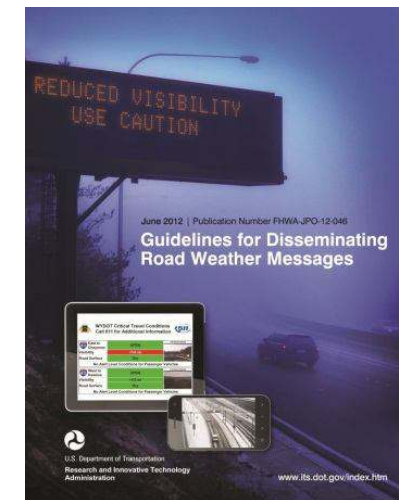# Communicating Winter Conditions and Other Weather Information to Road Users

- **Gabe Guevara**
- Transportation Specialist
- US DOT, Federal Highway Administration
- Gabriel.guevara@dot.gov

Roemer Alfelor, US DOT, Federal Highway Administration

Paul Pisano, US DOT, Federal Highway Administration

John Campbell, Battelle USA

0. OUTLINE

1. **Introduction – Motivation for Road Weather Messaging Guidelines**

2. **Role of FHWA Road Weather Program**

3. **Objectives and Approach for Messaging Guidelines**

4. **Phase 1 – Identify Requirements and Develop Preliminary Guidelines**

5. **Phase 2 – Evaluate and Refine the Guidelines**

6. **Conclusions**

1. INTRODUCTION – Motivation for Messaging Guidelines

- Transportation agencies need to determine the most effective ways to inform, warn, and advise travelers of adverse winter and other weather conditions.

- There is lack of uniform, consistent and effective road weather messages as well as dissemination methods throughout the country. This jeopardizes the safety and mobility of people who often have to travel in bad weather.

- Little had been done to evaluate the content, usefulness and effectiveness of the information and the means by which they are delivered to the travelers.

- No standards or guidelines exist that identify the most effective format/content and means by which different types of weather and road condition information can be communicated to the public.

2. Role of FHWA Road Weather Management Program

PROGRAM GOALS:

- Understand the impacts of weather on highway mobility and safety

- Develop, implement, and promote strategies and tools to mitigate those impacts, including traveler information strategies.
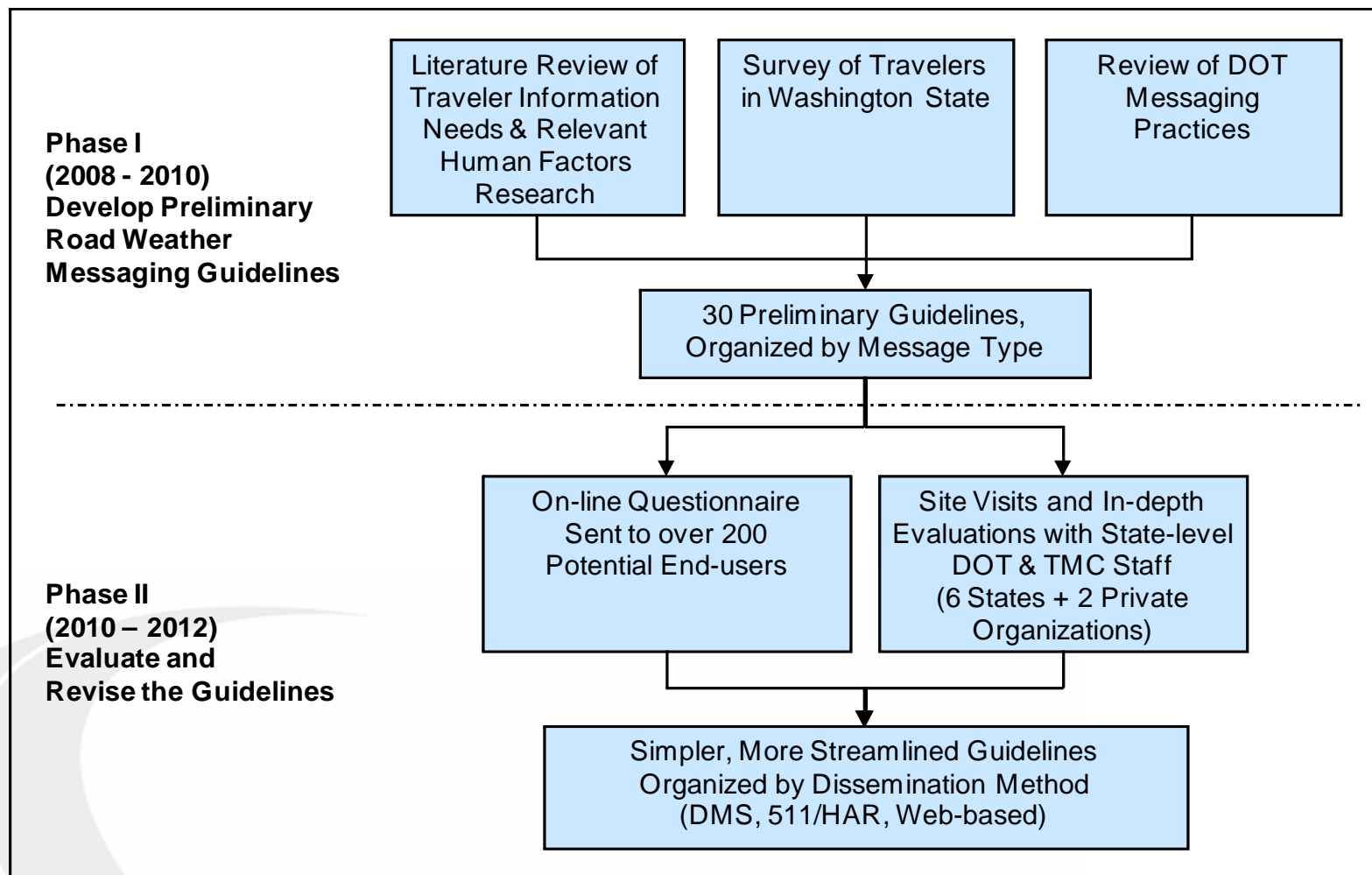
RESEARCH AND DEVELOPMENT AREAS:

- Performance Monitoring and Evaluation

- Data Capture and Management

- Dynamic Mobility Applications

- Weather-Responsive Traffic Management

3A. Objectives of Messaging Guidelines

1. Identify the information requirements of travelers across a representative number of weather events and travel scenarios including winter weather.

2. Evaluate the current state of the practice in weather-responsive traffic advisory and control strategies in terms of meeting those information requirements.

3. Recommend ways to improve those practices including development and implementation of road weather communication and messaging design guidelines.

3B. Approach for Messaging Guidelines

**Phase I
(2008 - 2010)
Develop Preliminary
Road Weather
Messaging Guidelines**

Literature Review of Traveler Information Needs & Relevant Human Factors Research	Survey of Travelers in Washington State	Review of DOT Messaging Practices

30 Preliminary Guidelines, Organized by Message Type

**Phase II
(2010 – 2012)
Evaluate and
Revise the Guidelines**

On-line Questionnaire Sent to over 200 Potential End-users	Site Visits and In-depth Evaluations with State-level DOT & TMC Staff (6 States + 2 Private Organizations)

Simpler, More Streamlined Guidelines Organized by Dissemination Method (DMS, 511/HAR, Web-based)

4A. Phase 1 - Identify Traveler Requirements for Representative Scenarios

Travel Scenarios							
Trip Purpose	*Time Constraints*	*Network Familiarity*	*Trip Duration*	*Trip Origin*	*Regional Differences*	*Vehicle Type*	*Travel Environment*
Commute	High	High	< ½ day	Home	Same-State	PV	Urban
1-way trip	Med	Med	1 Day	Home	Multi-State	PV	Interstate
Recreation	Low	Low	Multi-day	Trip-Leg (Hotel)	Same-State	PV	Mountain/ Rural
Commercial Vehicle Travel	High	High	Multi-day	Trip-Leg (Rest Area)	Multi-State	CV	Interstate
Local CV Operation	High	High	1 Day	Home (Warehouse / Depot)	Same-State	CV	Urban

4B. Phase 1 – Develop Preliminary Guidelines

Weather Events	→	Traveler Decisions	→	Dissemination Methods	→	Guidelines

What are the Key Mobility Impacts?

For Example:
Reduced traction
Congestion
Poor visibility
Road closures

What are the Traveler Decisions to be made?

For Example:
Expect & plan for delays
Use alternative route
Change travel modes
Drive with greater caution?
Change their driving behavior
Make safety-related preparations
Cancel their trip

What are the appropriate Dissemination Methods?

For Example:
DMS
HAR
511
Navigation devices
Cell phones
Kiosks
Websites

4C. Phase 1 – Preliminary Messaging Guidelines

1. Guidelines organized around traveler information needs and driving decisions.

2. 30 guidelines and 4 tutorials for road weather advisory and control information reflecting relevant literature and best practices for topics such as:

   - Message content, length, and structure

   - Design of fonts, colors, icons, and alerts

   - Display of map, weather, and traffic information

   - How to communicate timeframe, urgency, likelihood

3. Specific guidelines organized by design topic and message type (e.g., short text, auditory, open-format).

5A. Phase 2 - Evaluate and Revise the Guidelines: Framework

National Online Agency Questionnaire	State DOT/TMC Site Visits and Private Sector Interviews	Traveler Surveys

Recommendations for Refining and Revising the Preliminary Messaging Guidelines
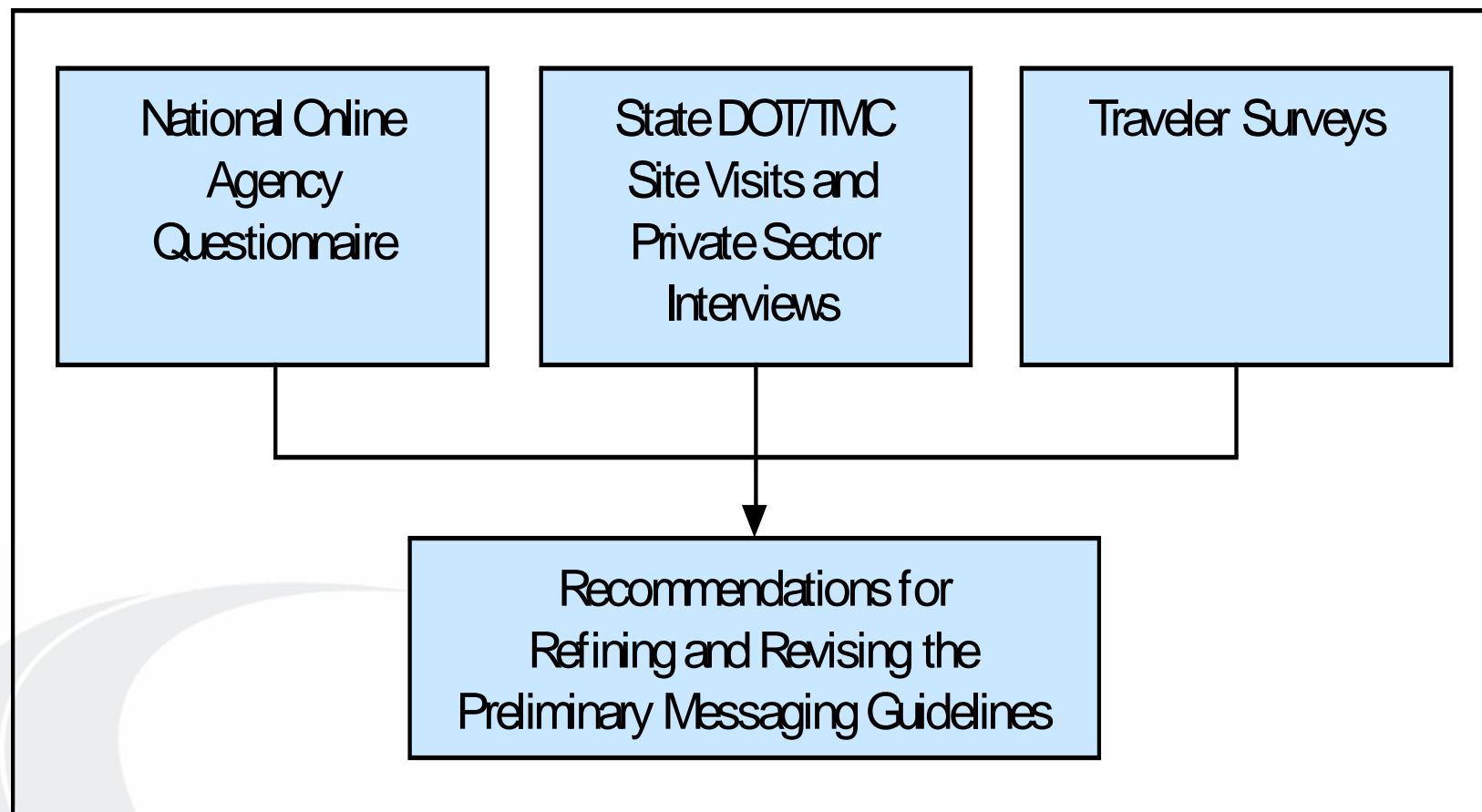
5B. Phase 2 – Participants in Guidelines Evaluation

1. Kansas City (KC) Scout TMC, Missouri

2. Wyoming Statewide TMC (WYDOT)

3. Colorado Springs, Colorado TMC (CSTMC)

4. Colorado DOT, Colorado **(**CDOT)

5. Washington State DOT (WSDOT) and six Northwest Regional TMCs

6. Maryland (MD) Coordinated Highway Action Response Team (CHART)

7. Meridian Environmental Technology, Inc.

8. Castle Rock, Inc

5C. Kansas City TMC Winter DMS Messages

GIVE SNOW PLOWS ROOM TO WORK USE CAUTION	BLOWING SNOW REDUCED VISBILITY TRAVEL NOT ADVISED	REDUCED VISIBILITY USE HEADLIGHTS USE CAUTION
SNOW PLOWING IN EFFECT EXPECT DELAYS	SEVERE THUNDERSTORM WARNING TUNE TO LOCAL MEDIA	WATER OVER ROADWAY [LANE SPECIFIED]
HIGH WIND ADVISORY USE CAUTION	FOG CONDITIONS REDUCED VISIBILITY USE CAUTION	DO NOT USE CRUISE CONTROL DURING [RAIN/SNOW/ICE]
EXTREME WEATHER USE CAUTION ON BRIDGES AND RAMPS	EXTREME WEATHER CONDITIONS TRAVEL NOT ADVISED	MAJOR WINTER STORM EXPECT DELAYS LIMIT TRAVEL

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5D. Sample Guideline

Left-hand page

Right-hand page

6. CONCLUSIONS

1. General road weather community indicates that the guidelines will be a valuable tool that provides useful information to message designers and other users.

2. The surveys, site visits, and interviews were valuable approaches for obtaining feedback on the guidelines from the selected state DOTs, TMCs and private service providers. .

3. State DOT and TMC users of the guidelines found the research foundation for the preliminary guidelines to be highly credible and confirming of their existing practices

To download the guidelines:

http://ntl.bts.gov/lib/45000/45600/45623/FinalPackage_JPO-12-046_V1.pdf