Guidelines for Disseminating Road Weather Messages

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Discussion Topics

• Project Overview
• Evaluate the Preliminary Guidelines and Revise them to Reflect End-user Feedback
• Review of Final Guidelines
• Conclusions & Current Status
Project Overview: Objectives

• Provide road weather advisory information to travelers in a manner that is understandable, useful, and effective.

• Augment guidance provided in other documents, including the Manual on Uniform Traffic Control Devices (MUTCD).

• Achieve greater consistency across the country in the framing, delivery and content of road weather information, supporting a seamless traveler experience.

• Encourage the wide-spread use of the guidelines and invite feedback to support continuous improvement.
Project Overview: General Approach

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

- 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)

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

Simpler, More Streamlined Guidelines Organized by Dissemination Method (DMS, 511/HAR, Web-based)
National Questionnaire: Evaluation Methods

• Preliminary guidelines, details of the request, and a link to the questionnaire were sent to key POCs for:
  – I-95 Corridor Coalition
  – FHWA’s TMC Pooled Fund Study
  – I-80 Winter Operations Coalition
  – Aurora Program

• Requests to complete the questionnaire were sent to approximately 200 individuals.

• 59 total responses were received; 21 answered all or most of the key questions.
State DOT/TMC Evaluations: Participants

- Washington DOT & 6 Northwest Regional TMCs (Ron Vessey)
- Castle Rock, Inc. (Peter Davies)
- Wyoming DOT Statewide TMC (Vince Garcia)
- Meridian Environmental Technology, Inc. (Leon Osborne)
- Colorado DOT (Joe Tucker)
- Colorado Springs TMC (Rob Helt)
- KC Scout (Nancy Powell)
- Maryland CHART (Ted Valmas)
State DOT/TMC Evaluations: Key Evaluation Activities

1. Phone calls/discussions to baseline weather messaging practices and relevant dissemination methods.

2. Site visits, with individual and group discussions, to provide:
   - General feedback on the value of the guidelines and suggestions for improvement.
   - Guideline-by-guideline reviews and feedback (e.g., usefulness, level of detail, figures/examples, where/how used).
   - Ways that the guidelines could improve current messaging practices.
Evaluate and Revise the Guidelines: Key Results

- The guidelines were seen as useful in helping users improve how they frame and communicate road weather information.
- The guidelines were seen as being helpful in meeting a need to achieve greater consistency across jurisdictions in messaging for travelers, across all the dissemination methods.
- The guidelines offer a useful tool for training operators, both experienced and new personnel.
- The format of the individual guidelines was viewed as extremely useful, with the discussions providing helpful information to the agencies.
- Agencies want operators to learn and internalize the principles incorporated in the guidelines and use them when considering their messaging decisions.
Evaluate and Revise the Guidelines: Recommendations for Revisions

- Organize the guidelines by major dissemination methods (Dynamic Message Signs (DMS, Auditory Messages) (511/HAR), and Web-based Messages).
- Increase focus on weather and road weather in the guidelines.
- Identify how to communicate road weather information such as roadway surface conditions more clearly in the guidelines.
- Consolidate guidelines and reduce verbosity as much as possible.
- Where human factors research in road weather is lacking, seek examples of best practices to develop guidelines.
- Provide clearer titles to each guideline.
Example of Guideline Revisions:
Established a Common Format
## Organization of 28 Guidelines under Three Dissemination Methods

<table>
<thead>
<tr>
<th>Dynamic Message Signs (9)</th>
<th>Auditory Messages (7)</th>
<th>Web-Based Messages (12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Structuring content</td>
<td>- Message content</td>
<td>- Tabular information</td>
</tr>
<tr>
<td>- Message length</td>
<td>- Message length</td>
<td>- Text paragraphs</td>
</tr>
<tr>
<td>- Display phases</td>
<td>- Message delivery</td>
<td>- Traffic camera display</td>
</tr>
<tr>
<td>- Phase timing</td>
<td>- Travel time and timestamps</td>
<td>- Map displays</td>
</tr>
<tr>
<td>- DMS abbreviations</td>
<td>- Diversion directions</td>
<td>- Wx-specific maps</td>
</tr>
<tr>
<td>- Travel or delay times</td>
<td>- Communicating urgency</td>
<td>- Visual icons</td>
</tr>
<tr>
<td>- Event location</td>
<td>- Communicating certainty &amp; enhancing credibility</td>
<td>- Color selection</td>
</tr>
<tr>
<td>- Communicating urgency</td>
<td></td>
<td>- Severe Wx alerts</td>
</tr>
<tr>
<td>- Communicating certainty &amp; enhancing credibility</td>
<td></td>
<td>- Linking to road weather information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Portable devices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Communicating urgency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Communicating certainty &amp; enhancing credibility</td>
</tr>
</tbody>
</table>
Guideline 2-1. Structuring DMS Message Content

<table>
<thead>
<tr>
<th>Message Element</th>
<th>Definition of Message Element</th>
<th>Example Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem</td>
<td>Provides information about the situation that the driver will encounter.</td>
<td>Flooding</td>
</tr>
<tr>
<td>Location</td>
<td>Describes the location or distance to the situation.</td>
<td>At US-23</td>
</tr>
<tr>
<td>Action</td>
<td>A recommendation to the driver in response to the problem and location information.</td>
<td>Use I-280 East</td>
</tr>
</tbody>
</table>
**Guideline 3-6. Communicating Degree of Urgency in Auditory Messages**

<table>
<thead>
<tr>
<th>Road Weather Message Characteristic</th>
<th>Guidelines</th>
</tr>
</thead>
</table>
| Specific words that can be used    | • Words that communicate moderate urgency include caution, warning, or hazard.  
• Words that communicate high urgency include: severe, emergency, life-threatening, deadly. |
| Order of presentation within a message | • Present the most important/urgent information at either the beginning or end of the message in order to improve driver recall of the message. |
| Use of repeated messages           | • Provide a means for repeating urgent messages—this is especially helpful for older drivers. |
| Use of time-stamps                 | • When providing time-stamps, the time data should reflect the time that the information was updated, not the time that the incident occurred. |
Guideline 4-1. Design of Tabular Information

• Order list/table items alphabetically or numerically.
• Provide a sort feature to allow travelers to find the information by route or region.
• If displaying a lot of text for many locations, display the short form by default and allow travelers to click for more information.
• Use multiple columns to display different types of information rather than multiple lines within the same row.
• Provide a time-stamp.
Effective Uses of the Guidelines

• Develop and approve uniform State message sets.
• Support effective ad hoc message creation and dissemination.
• Support the review and updating of current State DOT messages.
• Inform effective training for DOT and TMC managers and operators.
• Facilitate dialog among agencies that share responsibilities for framing road weather information messages at the state level.
  – State DOTs and TMC/TOCs
  – State meteorological services
  – Private sector support for traveler information systems
  – State IT departments
• Operators internalize the principles of effective communication of road weather information to the traveling public.
For More Information...

- Final Weather Messaging Guidelines

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