Abstract

NDDOT installed a Fixed Automated Spray Technology (FAST) system at the Red River bridge on I-94 across the North Dakota-Minnesota border. This is the second system statewide, and anti-icing systems represent promising technology for enhancing the safety and mobility of travelers with several more systems planned for installation throughout the state of North Dakota. In keeping with the national strategy of performance evaluation of ITS projects, ATAC is conducting an evaluation study of the FAST system at the Red River bridge location.

Methodology

The evaluation focus is on:

- Capturing lessons learned
- Documenting system costs and benefits
- Identifying any technical or institutional issues

The goal of the study is to provide reference and guidance to the NDDOT and other states to support future installations of FAST systems. The evaluation follows federal ITS project evaluation guidelines, and employs a framework which follows the goals and objectives in the context of the ITS goal areas identified in the National ITS Program including:

- Traveler safety
- Traveler mobility
- Transportation system operational efficiency
- Productivity of transportation providers
- Conversation of energy and protection of the environment

The evaluation areas include:

- Meeting project goals and objectives: improved safety and improved mobility
- System costs: initial and operation cost, and personnel requirements
- System functionality: user interface and existence of desired control functions
- System performance: reliability and effectiveness
- System benefits: reduction in cost over manual anti-icing operations, reduction in crashes, and reduction in delays
- Institutional arrangements: inter-agency/inter-jurisdictional cooperation between NDDOT and MnDOT, and bidding and contracting mechanism (RFP lessons learned)

Data Collection

The bridge average daily traffic in 2006 was 62,000 with about 5,500 trucks. An analysis of crash data at the bridge from 2001-2005 resulted in the following findings:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Vehicle-crashes</th>
<th>Weather Vehicle-crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2002</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>2003</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2004</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>2005</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

(Crash-vehicles Per Year)

* Dollar figures for these damages are being calculated

Test Plan

1. Traffic operational impact
   - Volume and speed data before and after
2. Traffic safety impact
   - Crash data before and after
3. FAST system performance
   - FAST system performance and reliability

Project Deliverables

1. Establishing the impact of anti-icing system on safety and mobility
2. Establishing the cost effectiveness of the automated anti-icing system vs. traditional anti-icing operations
3. Develop a lessons learned document identifying:
   a) Technical issues
   b) Institutional issues
   c) Contracting practices
   d) Multi-state project coordination issues