Navigating the Knowledge Resources for Rural Applications

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Cheryl Lowrance, Principal Transportation Engineer, Noblis

National Rural ITS Conference, Session E3
Tuesday, August 25, 2009
Agenda

• Session E3
  – Introduction to Resources
  – Tour: Benefits
  – Tour: Costs
  – Tour: Lessons
  – Example Case Study
  – Audience Exercise
Session Objectives

• You will:
  – Gain a general understanding of the ITS Knowledge Resources
    • What information is available
    • How that information is collected
    • How you can get answers to the questions you need

• We hope to:
  – Engage attendees by:
    • Seeking your input on specific experiences
    • Letting you navigate the knowledge resources in search of relevant resources
Introduction to Resources: ITS Benefits Database

- **Purpose:** Support informed decision-making by transportation leaders
  - Analyze and document ITS benefits
  - Disseminate information about ITS benefits

www.itsbenefits.its.dot.gov
Benefits Database Background

- 546 entries sorted into 17 technology categories as of August 1, 2009
- Entries discussing benefits in each of the ITS Goal Areas
  - Safety
  - Efficiency
  - Mobility
  - Productivity
  - Environmental impacts
  - Customer satisfaction
- Browse/view benefits by application area, geographic location (country, state), and goal area
- Since 2003, publish Benefit of the Month on the ITS JPO homepage (69 now available)
Introduction to Resources: ITS Costs Database

- **Purpose:** Support informed decision-making by transportation leaders
  - Analyze and document the costs of ITS
  - Provide easy access to information on non-recurring and recurring costs
  - Disseminate information about ITS costs

[www.itscosts.its.dot.gov](http://www.itscosts.its.dot.gov)
ITS Costs Database Background

- On line with only unit costs September 1999
- Added system cost summaries September 2003
  - Published a total of 179 as of August 1, 2009
- Made adjusted and unadjusted unit cost data available beginning September 2004
  - Unit cost updated annually
Introduction to Resources: ITS Lessons Learned Knowledge Resource

• Lessons from those who have gone before on how to
  – Plan
  – Design
  – Deploy
  – Operate
  – Maintain

• Over 400 entries sorted into 9 general lesson areas

www.itslessons.its.dot.gov
ITS Lessons Learned Database Background

• 408 entries as of August 1, 2009, categorized by lesson category, ITS application area, geographic location, systems engineering activity/phase
• Since August 2005, publish Lesson of the Month on the ITS JPO homepage (56 now available)
• March 2008, Synthesis Lessons on key ITS areas of interest:
  – Management and Operations
  – Policy and Planning
  – Design and Deployment
  – Leadership and Partnerships
  – Funding
  – Technical Integration
  – Procurement
  – Legal Issues
  – Human Resources
Questions – How many of you…

- Have used one or more of these databases? If so, …
  - What for?
  - Did you find what you needed?
  - What else would have been helpful to you?
- Have contributed data?
  - Benefits
  - Costs
  - Lessons learned
- Are a point-of-contact for a lesson?
- Have worked on projects profiled in the benefits, costs or lessons learned databases?
Tour: Benefits Database
Road Geometry Warning

In Oregon and Colorado, downhill speed warning systems decreased truck crashes up to 13 percent at problem sites. (31 October 2006)

In Myrtle Creek, Oregon an advanced curve speed warning system installed on I-5 reduced the speed of 76 percent of drivers surveyed. (June 2006)
In Oregon and Colorado, downhill speed warning systems decreased truck crashes up to 13 percent at problem sites.

31 October 2006
Colorado, Oregon, USA

Summary Information

This conference presentation provided an overview of several ITS technologies that improve safety for commercial vehicles operating in rural areas.

Downhill Speed Warning Systems

Several years of safety data collected at multiple sites show that road geometry warning systems can eliminate rollover crashes and the impacts are sustainable. Downhill speed warning systems have proven effective at mitigating risk to large trucks in areas with steep terrain. At problem sites in Oregon and Colorado these systems have decreased truck crashes by up to 13 percent.

Comments
No comments posted to date

Benefits From This Source

At a tunnel in Pennsylvania, an overheight/overwidth warning system improved safety. Occasional crashes demonstrate value of system and importance of maintenance.

In Oregon and Colorado, downhill speed warning systems decreased truck crashes up to 13 percent at problem sites.

Costs From This Source

In Colorado, a Truck Tip-Over Warning System was deployed on I-70 at a cost of $446,687.
Road Weather Management (47 unique benefit summaries found)

Surveillance, Monitoring, & Prediction

A modeling study compared the benefits of using road weather information systems (RWIS) with the costs of reacting to prevailing weather conditions and found that RWIS technologies could reduce snow and ice control costs by as much as 10 percent. (1991)

Atmospheric Conditions

In Salt Lake City, Utah, staff meteorologists stationed at a TOC provided detailed weather forecast data to winter maintenance personnel, reducing costs for snow and ice control activities, and yielding a benefit-to-cost ratio of 10:1. (February 2007)

In Finland, a benefit-cost analysis supported the deployment of weather information controlled variable speed limits on highly trafficked road segments. (25 March 2006)

In Oregon, approximately 90 percent of motorists surveyed indicated that they would slow down in response to messages displayed by an automated high wind warning system. (February 2008)

In Oregon, the benefit-to-cost ratios for two automated wind warning systems were 4.13:1 and 22.80:1. (February 2006)

In a mountainous area of Spokane, Washington, 94 percent of travelers surveyed indicated that a road weather information website made them better prepared to travel, 56 percent agreed the information helped them avoid travel delays. (8 January 2004)

In a mountainous region of Spokane, Washington, about one-third of CVOs interviewed would consider changing routes based on the information provided on a road weather information website and highway advisory radio system; however, few could identify viable alternate routes. (8 January 2004)

In Kamloops, British Columbia, anti-icing winter maintenance operations cost 58 percent less than traditional winter maintenance operations that involve granular salt, (2004)

In British Columbia, the City of Kamloops experienced a seven percent decrease in snow and ice-related crashes following the introduction of pre-wetting and anti-icing techniques. (2004)

In Salt Lake City, Utah the ADVISE fog warning system tested on a two-mile section of I-215 promoted more uniform traffic flow, reducing vehicle speed variability by 22 percent while speeds increased 11 percent. (June 2003)

In Tennessee, a low visibility warning system installed on I-75 dramatically reduced fog-related crashes. (May 2003)


Idaho Storm Warning System Operational Test - Final Report (14 March 2001)
Tour: Costs Database

Unit Costs

Unit Costs are the costs associated with an individual ITS element and are accessible as unadjusted and adjusted values. Unit costs can be viewed online, and downloaded as an Excel file and PDF document.

View an example of unit costs.

System Costs

System costs consists of multiple ITS elements and typically represents the total cost of an ITS project or portion of an ITS project. System costs are presented as summaries and can be viewed by application, by state, and by country.

View a sample system cost summary.
Unit Costs are the cost associated with an individual ITS element and are accessible as unadjusted and adjusted values. Unit costs can be viewed on-line, and downloaded as an Excel file and PDF document.

System costs consist of multiple ITS elements and typically represents the total cost of an ITS project or portion of an ITS project. System costs are presented as summaries and can be viewed by application, by state, and by country.

Intelligent Infrastructure
- Arterial Management
- Freeway Management
- Crash Prevention & Safety
- Road Weather Management
- Roadway Operations & Maintenance
- Transit Management
- Transportation Management Centers

Intelligent Vehicles
- Traffic Incident Management
- Emergency Management
- Electronic Payment & Pricing
- Traveler Information
- Information Management
- Commercial Vehicle Operations
- Intermodal Freight
- Collision Avoidance
- Driver Assistance
- Collision Notification
Crash Prevention & Safety

Road Geometry Warning

Curve Speed Warning

In Colorado, a Truck Tip-Over Warning System was deployed on I-70 at a cost of $446,687. (31 October 2006)

Colorado DOT deployed a truck speed warning system in Glenwood Canyon at a cost ranging from $25,000 to $30,000. (November 2001)

Downhill Speed Warning

Colorado DOT deployed a truck speed warning system in Glenwood Canyon at a cost ranging from $25,000 to $30,000. (November 2001)

Overheight/Overwidth Warning

Based on a nationwide survey of states operating overheight detection systems, the initial costs of active laser- or infrared-based systems vary considerably, ranging from $7,000 to $70,000. (12-16 January 2003)

The Michigan Department of Transportation estimated that an ITS-based active overheight detection and warning system installed at both approaches to a bridge would cost $110,000. (24-27 March 2002)

Ramp Rollover Warning

The Pennsylvania (PA) Turnpike Commission expanded its statewide advanced traveler information system (ATIS) to better inform motorists of traffic, weather, and emergency conditions along the PA Turnpike. The overall project cost was $3.2 million. (April 2006)

The cost of an automated truck rollover warning system can vary significantly, ranging from $50,000 to $500,000. (7 December 2005)

The cost of a prototype truck rollover warning system on the Capital Beltway in Virginia and Maryland was estimated at $166,462 for a one-lane ramp and $268,507 for a two-lane ramp. (11-15 January 1998)

Highway-Rail Crossing Warning Systems

The annualized life-cycle costs for full ITS deployment and operations in Tucson were estimated at $72.1 million. (May 2005)
Road Geometry Warning

Relevant Unit Cost Subsystems:

- Unadjusted
- Adjusted (to 2007 dollars)
- Roadside Telecommunications (RS-TC)
- Roadside Detection (RS-D)
- Roadside Information (RS-I)

Available System Cost Data:

- In Colorado, a Truck Tip-Over Warning System was deployed on I-70 at a cost of $446,887. (31 October 2006)
- Colorado DOT deployed a truck speed warning system in Glenwood Canyon at a cost ranging from $25,000 to $30,000. (November 2001)
- Based on a nationwide survey of states operating overweight detection systems, the initial costs of active laser- or infrared-based systems vary considerably, ranging from $7,000 to $70,000. The Alaska Department of Transportation & Public Facilities (DOT&PF) sponsored a research project... (12-16 January 2003)
- The Michigan Department of Transportation estimated that an ITS-based active overweight detection and warning system installed at both approaches to a bridge would cost $110,000. This summary presents the cost analysis of an active overweight detection and warning system,... (24-27 March 2002)
- The Pennsylvania (PA) Turnpike Commission expanded its statewide advanced traveler information system (ATIS) to better inform motorists of traffic, weather, and emergency conditions along the PA Turnpike. The overall project cost was $8.2 million. The Pennsylvania Turnpike Commission’s ATIS (Phase III) project enhances the traveler information... (April 2006)
- The cost of an automated truck rollover warning system can vary significantly, ranging from $50,000 to $500,000. As part of an evaluation of automated truck rollover warning systems, PennDOT researched curve... (7 December 2005)
- The cost of a prototype truck rollover warning system on the Capital Beltway in Virginia and Maryland was estimated at $166,462 for a one-lane ramp and $268,507 for a two-lane ramp.
In Colorado, a Truck Tip-Over Warning System was deployed on I-70 at a cost of $446,687.

31 October 2006
Colorado, USA

Summary Information

In Colorado, a Truck Tip-Over Warning System was deployed on I-70 eastbound just outside Idaho Springs to help prevent rollover crashes on sharp curves. The system consisted of two piezo weigh-in-motion (WIM) devices, traffic detectors, four fiber optic message signs, computer processing equipment and associated software, and a controller cabinet.

When vehicles were detected exceeding the maximum safe speed for their weight category, the warning system was activated and messages were displayed on otherwise blanked-out roadside message signs.

The low bid for the project was $446,687 (2002). The equipment list of the major components identified in the bid tabulation is presented in the table below.

<table>
<thead>
<tr>
<th>EQUIPMENT LIST - MAJOR COMPONENTS OF BID TAB*</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck Tip Over Warning System (ea.) (WIM)</td>
<td>$278,611</td>
</tr>
<tr>
<td>Blank Out Sign (Fiber Optic) (4 Ea x 6,768 $/ea.)</td>
<td>$35,112</td>
</tr>
<tr>
<td>Steel Sign Post (W6x12) (39.5 if x 23 $/ft)</td>
<td>$908</td>
</tr>
<tr>
<td>Steel Sign Post (W8x18) (33 if x 32 $/if)</td>
<td>$891</td>
</tr>
<tr>
<td>Concrete Footing (Type 3) (3 ea x 976 $/ea)</td>
<td>$2,928</td>
</tr>
<tr>
<td>Concrete Footing (Type 1) (2 ea x 941 $/ea)</td>
<td>$1,882</td>
</tr>
</tbody>
</table>

*Colorado DOT CoTrip, "Design Guidelines for Including ITS in Projects"

Comments

No comments posted to date

Benefits From This Source

Source

CVO/Freight and ITS Session (Presentation)

Author: Drakopoulos, Alex (Marquette University)


Published By: Presentation at the 12th annual ITS Forum, Wisconsin Chapter of ITSAmerica - Smartways, Milwaukee, Wisconsin.

Source Date: 31 October 2006


System Cost

System Cost: $446,687 (2002).
Unit costs data for commercial vehicle systems has been updated with data from the Commercial Vehicle Information Systems and Networks (CVISN) self-evaluation cost collection activity. The report summarizing the CVISN cost data, collection, and analysis is available in HTML and PDF formats. The former commercial vehicle subsystems are available to users for historical reference in PDF and Excel formats.

<table>
<thead>
<tr>
<th>Roadside Telecommunications (RS-TC)</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Roadside Detection (RS-D)</td>
<td></td>
</tr>
<tr>
<td>Roadside Control (RS-C)</td>
<td></td>
</tr>
<tr>
<td>Roadside Information (RS-I)</td>
<td></td>
</tr>
<tr>
<td>Roadside Rail Crossing (R-RC)</td>
<td></td>
</tr>
<tr>
<td>Toll Plaza (TP)</td>
<td></td>
</tr>
<tr>
<td>Parking Management (PM)</td>
<td></td>
</tr>
<tr>
<td>Remote Location (RM)</td>
<td></td>
</tr>
<tr>
<td>Emergency Response Center (ER)</td>
<td></td>
</tr>
<tr>
<td>Emergency Vehicle On-Board (EV)</td>
<td></td>
</tr>
<tr>
<td>Information Service Provider (ISP)</td>
<td></td>
</tr>
<tr>
<td>Transportation Management Center (TM)</td>
<td></td>
</tr>
<tr>
<td>Transit Management Center (TR)</td>
<td></td>
</tr>
<tr>
<td>Toll Administration (TA)</td>
<td></td>
</tr>
</tbody>
</table>
# Equipment Costs for Remote Location (RM)

Note: The date in parentheses under the capital cost value and O&M cost value represents the dollar year of the cost values. All costs are in $K.

<table>
<thead>
<tr>
<th>Unit Cost Element</th>
<th>IDAS #</th>
<th>Life Years</th>
<th>Capital Cost $K (Source Year)</th>
<th>O&amp;M Cost $K/Year (Source Year)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCTV Camera</td>
<td>RM001</td>
<td>7</td>
<td>2.5 (2005)</td>
<td>0.1 - 0.24 (2004)</td>
<td>Interior fixed mount camera for security. Low cost represents black &amp; white pan/tilt/zoom (PTZ). High cost represents color PTZ. Does not include installation.</td>
</tr>
<tr>
<td>Integration of Camera with Existing Systems</td>
<td>RM002</td>
<td>10</td>
<td>2 - 2.5 (1993)</td>
<td></td>
<td>Per location.</td>
</tr>
<tr>
<td>Integration of Kiosk with Existing Systems</td>
<td>RM004</td>
<td>7</td>
<td>2.1 - 26.1 (2005)</td>
<td></td>
<td>Software costs are for COTS (low) and developed/Outdoor (high).</td>
</tr>
<tr>
<td>Kiosk Upgrade for Interactive Usage</td>
<td>RM005</td>
<td>5</td>
<td>5.0 (1995)</td>
<td>0.5 - 0.0 (1995)</td>
<td>Interactive information display interface (upgrade from existing interface).</td>
</tr>
<tr>
<td>Kiosk Software Upgrade for Interactive Usage</td>
<td>RM006</td>
<td>5</td>
<td>10.12 (1995)</td>
<td></td>
<td>Software is COTS.</td>
</tr>
<tr>
<td>Transit Status Information Sign</td>
<td></td>
<td>10</td>
<td>4.6 (2005)</td>
<td></td>
<td>A LED display installed at transit terminal that provides status information on transit arrival. Cost depends on quality, size, and controller capabilities.</td>
</tr>
<tr>
<td>Software, Integration for Smart Card Vending</td>
<td>RM008</td>
<td>20</td>
<td>3.5 (1995)</td>
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Unit costs data for commercial vehicle systems has been updated with data from the Commercial Vehicle Information Systems and Networks (CVSN) self-evaluation cost collection activity. The report summarizing the CVSN cost data, collection, and analysis is available in **HTML** and **PDF** formats. The former commercial vehicle subsystems are available to users for historical reference in **PDF** and **Excel** formats.

- Roadside Telecommunications (RS-TC)
- Roadside Detection (RS-D)
- Roadside Control (RS-C)
- Roadside Information (RS-I)
- Roadside Rail Crossing (R-RC)
- Toll Plaza (TP)
- Parking Management (PM)
- **Remote Location (RM)**
- Emergency Response Center (ER)
- Emergency Vehicle On-Board (EV)
- Information Service Provider (ISP)
- Transportation Management Center (TM)
- Transit Management Center (TR)
- Toll Administration (TA)
- Transit Vehicle On-Board (TV)
- Commercial Vehicle Electronic Credentialing (CE/CV) Administration
- Commercial Vehicle Safety Information Exchange (CVSIE)
- Commercial Vehicle Electronic Screening (CVS) (Preclearance)
- Commercial Vehicle On-Board (CV)
- Fleet Management Center (FM)
- Vehicle On-Board (VOS)
- Personal Devices (PD)
Equipment Costs for Remote Location (RM)

Note: Equipment list adjusted to 2007 dollars. The date in parentheses under the capital cost value and O&M cost value represents the dollar year from which the cost value was adjusted. All costs are in $K.

<table>
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<tr>
<th>Unit Cost Element</th>
<th>IDAS #</th>
<th>Life Years</th>
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<tr>
<td>Kiosk Upgrade for Interactive Usage</td>
<td>RM005</td>
<td>5</td>
<td>5 - 8 (1995)</td>
<td>0.5 - 0.8 (1995)</td>
<td>Interactive information display interface (upgrade from existing interface).</td>
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<tr>
<td>Kiosk Software Upgrade for Interactive Usage</td>
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<td></td>
<td>Software is COTS.</td>
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<td>Transit Status Information Sign</td>
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<td>4 - 8 (2005)</td>
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</table>
Tour: Lessons Learned Knowledge Resource
Search Results (5 unique lessons found)

To view:
- Single Lesson - Select a lesson title link
- Multiple Lessons - Select the lesson checkboxes and then select a View Selected Lessons button

View Selected Lessons

Management & Operations

Operations
- [ ] Install Automatic Vehicle Location (AVL) technology to greatly enhance transit agency performance.
- [ ] Provide traveler information in rural areas to allow for good travel decisions in inclement weather and construction season.

Maintenance
- [ ] Provide traveler information in rural areas to allow for good travel decisions in inclement weather and construction season.

System Data & Storage
- [ ] Install Automatic Vehicle Location (AVL) technology to greatly enhance transit agency performance.
- [ ] Recognize issues in deploying ITS technologies for coordinating and improving Human Services Transportation.

Policy & Planning

Planning
Provide traveler information in rural areas to allow for good travel decisions in inclement weather and construction season.

Oregon DOT's experience with rural traveler information systems.

November 2001
Oregon, USA

E-mail | Post a Comment | Print

Background (Show)

Lesson Learned (Hide)

This lesson is about Oregon DOT's experience with providing traveler information in rural areas. Many agencies did not recognize until recently the need or potential benefits to providing traveler information in rural areas. Providing traveler information in rural locations has proven to be very valuable in terms of reduced user delay and safety benefits. The need for such information to the public is particularly important in order for them to avoid construction congestion during summer months and to travel safely during the winter months. Oregon DOT's experience in providing traveler information in the rural areas via 511 telephone services and Web-based services are presented below.

- While designing your 511 services, consider the contingency of being overwhelmed with high call volume during inclement weather conditions. Customer satisfaction is key to a successful traveler information system. Agencies have experienced over-whelming response to their phone based traveler information system during peak weather periods, resulting in over-run systems often leading to user dissatisfaction.

- Recognize the costs associated with maintaining an up to date Web-based traveler information service. Oregon DOT has utilized web-based technologies to provide statewide traveler information for many years. The TripCheck System was designed to allow ODOT personnel from anywhere in the state to enter information into the on-line system. The de-centralized system has proven to be a success. The costs to maintain the TripCheck site annually is approximately $117,000 which does not include the time of ODOT personnel to enter the information into the system or the cost to gather the information from the field. The public has embraced the system and user sessions top 350,000 during peak periods in the winter months and average 100-200,000 during non-peak periods. Challenges noted include the need to recognize the costs associated with maintaining an up to date system. Without accurate, timely information, the public will recognize the weaknesses of the system and discontinue use.

- Provide e-mail address on your traveler information Web site and assign staff hours to respond to the received emails. To maintain good relations with the public, agencies should consider providing an e-mail address for users to communicate with the host agency and also provide staff-hours for personnel to respond to received e-mails.

- Include costs of advertising of rural traveler information systems. Advertising of rural traveler information systems, through road-side signs, television and radio ads, is recommended and should be included in project budgets.

Source

Rural ITS Toolbox
Author: Deeter, D., H. M. Zarean, and D. Register
Published By: U.S. DOT Federal Highway Administration
Source Date: November 2001
EDL Number: 13477
Other Reference Number: FHWA-OP-01-030
Other Lessons From this Source

Contacts

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703-993-1738
aflannery@gmu.edu

Lesson Analyst:
Firooz Kabir
Noblis
202-863-2987
firooz.kabir@noblis.org
Resources:

- **Systems Engineering for Intelligent Transportation Systems: An Introduction for Transportation Professionals** by Federal Highway Administration, January, 2007
  Cost: Free

  Cost: Free

**Concept of Operations** (119 unique lessons found)

To view:

- Single Lesson - Select a lesson title link
- Multiple Lessons - Select the lesson checkboxes and then select a View Selected Lessons button
- In addition to the lessons learned listed below, use the Search option at the top of this page to find lessons on a particular topic by using keywords of your choice.
- Related Resources

- **Straddle the ability to coordinate and manage operations for planned special events by co-locating a traffic management center with a public safety center with representatives from police, fire and 911.**
  Experience from Montgomery County, Maryland using ITS for planned special events.

- **Use portable ITS equipment to monitor and control traffic flow at major signalized intersections located at entrance and exit points near planned special events.**
  Experience from Duchess County, New York using ITS for planned special events in a rural area.

- **Consider deploying ITS in a work zone to improve traffic safety and mobility during construction.**
  Arkansas' experience using ITS in work zones.

- **Be aware that integration of advanced transportation management systems, regardless of size, creates challenges throughout project deployment.**
  Experience implementing an ATMS in Fort Collins, Colorado.

- **Implement travel demand management and ITS strategies to successfully reduce congestion and delay during special events.**
  Phoenix International Raceway's experience with TDMM strategies.

- **Consider the impact fees have on parking behavior.**
  Experience from the smart parking field test at the Rockridge, Oakland BART station.

- **Prepare in advance for severe weather by staffing enough snow plow operators and ensuring that public information systems will be updated with current weather and road conditions.**
  Experience from the 2011 winter storm emergency response in the Commonwealth of Pennsylvania.

- **Identify key design issues in the deployment of advanced parking management systems (APMS).**
  Experience from APMS deployment sites.

- **Involve all appropriate stakeholders in a formal and collaborative manner during each phase of the advanced parking management systems (APMS) project.**
  Experience from APMS deployment sites.

- **Utilize transportation tools in communications, traffic control, and monitoring and prediction to maximize the ability of the highway network to support evacuation operations.**
  Experience statewide in the successful use of the transportation network in emergency evacuations with advance notice.
Example Case Study

- Safety Challenge: Crashes due to unsafe speeds
- Strategies:
  - Dynamic Speed Warning Devices
  - Curve Warning Systems
  - Variable speed limits during inclement weather

- Keywords (for Searching):
  - Speed
  - Speed Warning
  - Variable Speed Limit
  - Warning systems
  - Speed Warning Systems

Source: Low-Cost Treatments for Horizontal Curve Safety, December 2006. Picture courtesy of Caltrans
Example Case Study: Benefits
Example Case Study: Costs

Colorado DOT deployed a truck speed warning system in Glenwood Canyon at a cost ranging from $25,000 to $30,000.

From the Rural ITS Toolbox report: Subsection 7.1 Speed Warning Systems (Truck Speed Warning System)

November 2001
Glenwood Canyon, Colorado, USA

Summary Information

A truck speed warning system was deployed on a downgrade curve along US 70 in Glenwood Canyon, Colorado. The curve tightens from 7 to 5 degrees. This stretch of roadway had many severe crashes and serious injuries. If a truck is detected (via radar) exceeding the posted speed, then the truck’s speed is displayed on the road signage with the message “YOU ARE SPEEDING AT [XX] M.P.H. 45 M.P.H. CURVE AHEAD.” The system cost of the system is estimated in the range of $25,000 to $30,000.

Source

Rural ITS Toolbox

Author: Deeter, D., H. M. Zarean, and D. Register

Published By: U.S. DOT Federal Highway Administration

Source Date: November 2001

Benefits From This Source

In Colorado, a downhill truck speed warning system installed on a curved section of I-70 reduced 85th percentile truck speeds by 27 percent.

Lessons From This Source

- Provide traveler information in rural areas to allow for good travel decisions in inclement weather and construction season.
- Use speed warning signs on dangerous curves to reduce speeds of trucks.

Application Areas

- Intelligent Infrastructure > Crash Prevention & Safety > Road Geometry Warning > Curve Speed Warning
- Intelligent Infrastructure > Crash Prevention & Safety > Road Geometry Warning > Downhill Speed Warning

Related Unit Cost Subsystems

Roadside Telecommunications (RS-TC)
Roadside Detection (RS-D)
Roadside Information (RS-I)

Keywords

None defined
Example Case Study: Lessons Learned

Use speed warning signs on dangerous curves to reduce speeds of trucks.

Colorado DOT utilizes low cost system to reduce truck speeds on mountain passes.

November 2001
Colorado, USA

Background

FHWA published guidance on the use of ITS in rural locations referred to as the Rural ITS Toolbox. The document represents best practices at the time of publication with regard to many ITS services including Emergency services; Tourism & Traveler Information; Traffic Management; Rural Transit; Crash Prevention; Operations and Maintenance; and Surface Transportation & Weather.

Information includes best practices to illustrate successful development of ITS deployment plans and also a toolbox of resources that document successful rural ITS applications.

Lesson Learned

FHWA’s Rural ITS Toolbox noted a relatively low-tech approach that was used by Colorado DOT to address mountainous terrain and high speed trucks. Colorado DOT has many highways that run through the mountains and have high truck traffic on these highways. The Colorado DOT’s experience reveals the following with regard to reducing truck speeds on dangerous curves.

- Consider using simple radar speed detection devices in combination with dynamic message signs. To convey to trucks...
Lead-in to Audience Participation Activity

• What are the transportation challenges in your region/area?
• What ITS strategies have been identified as possible solutions?
• How do you decide if a specific ITS technology or solution is cost effective for your region/area?
• How do you find out what other agencies have implemented throughout the state, region, country, etc?
• How can you use the information in the U.S. DOT Knowledge Resources to assist with decision making/next steps?
• What are some of the situations where you can see that using the Knowledge Resources could help you do your job?
1. Break up into smaller discussion groups

   *Each group should then:*

2. Discuss and review activity instructions
   - Select a recorder and a reporter for the group

3. Create a transportation scenario or situation in which it will be necessary to gather information about ITS in your region.

4. Discuss how your group would use the information in the Knowledge Resources to assist with data-gathering to support decision making/next steps

5. Discuss and document other sources of information that may be needed and how those would be obtained.
Potential Transportation Scenarios to get you started

- Real-world problem facing you as a transportation professional
- Transportation problem or issue in your region, where you’re looking for potential solutions
- Your boss tells you that you should look into deploying a particular ITS application, because your neighboring State DOT did
- You are a systems manager or a project engineer, in charge of devising the procurement approach, design, and implementation of a specific ITS application
- You are a transportation planner and need to look at the cost-effectiveness of various ITS applications for your region
- BE CREATIVE!
Report back to the group:

- Transportation scenario or situation created by your group
- Ideas your group came up with to use the information in the U.S. DOT Knowledge Resources to assist with data-gathering to support decision making/next steps
- Other sources of information that may be needed and ideas for how those would be obtained
- Lessons learned or insights from the group activity
Audience Participation
Using ITS Decisionmakers’ Resources: Recap

• ITS Applications Overview

• ITS Benefits Database
  – www.itsbenefits.its.dot.gov

• ITS Costs Database
  – www.itscosts.its.dot.gov

• ITS Deployment Tracking Database

• ITS Lessons Learned Knowledge Resource
  – www.itslessons.its.dot.gov
Any Last Questions?
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