



Intelligent Transportation Systems
U.S. Department of Transportation



Navigating the Knowledge Resources for Rural Applications

Greg Hatcher, Program Assessment Manager, Noblis
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



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



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

The screenshot shows the RITA (Research and Innovative Technology Administration) website for Intelligent Transportation Systems. The page is titled "Lessons Learned" and features a search bar, navigation menus, and two main sections for searching lessons: "Search Lessons by Lesson Category" and "Search Lessons by Classification(s)".

Search Lessons by Lesson Category:

- Management & Operations
- Policy & Planning
- Design & Deployment
- Leadership & Partnerships
- Funding
- Technical Integration
- Procurement
- Legal Issues
- Human Resources

Search Lessons by Classification(s):

- Lesson Categories:** Management & Operations, Policy & Planning, Design & Deployment, Leadership & Partnerships, Funding, Technical Integration, Procurement, Legal Issues, Human Resources.
- Application Areas:** Arterial Management, Freeway Management, Crash Prevention & Safety, Road Weather Management, Roadway Operations & Maintenance, Transit Management, Transportation Management, Traffic Incident Management, Emergency Management, Electronic Payment & Pricing, Traveller Information.
- Goal Areas:** Safety, Mobility, Productivity, Efficiency, Energy & Environment, Customer Satisfaction.
- States & Countries:** USA, ALABAMA, ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, CONNECTICUT, DELAWARE, FLORIDA, GEORGIA, HAWAII, ILLINOIS, INDIANA, IOWA, KANSAS, KENTUCKY, LOUISIANA, MAINE, MARYLAND, MASSACHUSETTS, MICHIGAN, MINNESOTA, MISSISSIPPI, MISSOURI, MONTANA, NEBRASKA, NEVADA, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, NORTH DAKOTA, OHIO, OKLAHOMA, OREGON, PENNSYLVANIA, RHODE ISLAND, SOUTH CAROLINA, SOUTH DAKOTA, TENNESSEE, TEXAS, UTAH, VERMONT, VIRGINIA, WASHINGTON, WEST VIRGINIA, WISCONSIN, WYOMING.

Use the Ctrl (or Command) key to select/deselect multiple items within a classification area. Use the Refresh icon found underneath the classification area box to clear all selections in a classification area.



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

RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION
INTELLIGENT TRANSPORTATION SYSTEMS

[About RITA](#) |
 [Communities of Interest](#) |
 [Contact Us](#) |
 [Press Room](#) |
 [RITA Offices](#) |
 [Site Map](#) |

[Benefits Database](#) |
 [Browse Benefits By](#) |
 [Benefit of the Month](#) |
 [ITS Knowledge Resources](#)

[ITS >> Benefits Database >> Home](#)

Search for: in [Benefits](#)

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links: [A](#) [B](#) [C](#) [US](#) [LL](#)

Search Benefits by Applications:
[Application Definitions](#) [Database Help](#)

Intelligent Infrastructure

Arterial Management

Freeway Management

Crash Prevention & Safety

Road Weather Management

Roadway Operations & Maintenance

Transit Management

Transportation Management Centers

Traffic Incident Management

Emergency Management

Electronic Payment & Pricing

Traveler Information

Information Management

Commercial Vehicle Operations

Intermodal Freight

Intelligent Vehicles

Collision Avoidance

Driver Assistance

Collision Notification

Search Benefits by Classification(s):
[How to search by classification](#)

Select one or more items from the classifications areas ([show classification area descriptions](#))

Application Areas	Goal Areas	States & Countries
<ul style="list-style-type: none"> Arterial Management Freeway Management Crash Prevention & Safety Road Weather Management Roadway Operations & Maintenance Transit Management Transportation Management Centers Traffic Incident Management Emergency Management Electronic Payment & Pricing Traveler Information 	<ul style="list-style-type: none"> Safety Mobility Productivity Efficiency Energy & Environment Customer Satisfaction 	<ul style="list-style-type: none"> USA STATES Alabama Alaska Arizona Arkansas California Colorado Connecticut Delaware
Clear selections	Clear selections	Clear selections



ITS >> [Benefits Database](#) >> Home

Search for: in Benefits

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links:

Search Benefits by Applications: [Application Definitions](#) [Database Help](#)

Intelligent Infrastructure

 Arterial Management	 Freeway Management	 Crash Prevention & Safety	 Road Weather Management	 Roadway Operations & Maintenance	 Transit Management	 Transportation Management Centers
 Traffic Incident Management	 Emergency Management	 Electronic Payment & Pricing	 Traveler Information	 Information Management	 Commercial Vehicle Operations	 Intermodal Freight

Intelligent Vehicles

 Collision Avoidance	 Driver Assistance	 Collision Notification
-------------------------	-----------------------	----------------------------

Search Benefits by Classification(s): [How to search by classification](#)

Select one or more items from the classifications areas ([show classification area descriptions](#))

Application Areas	Goal Areas	States & Countries
<ul style="list-style-type: none">Arterial ManagementFreeway ManagementCrash Prevention & SafetyRoad Weather ManagementRoadway Operations & MaintenanceTransit ManagementTransportation Management CentersTraffic Incident ManagementEmergency ManagementElectronic Payment & PricingTraveler Information	<ul style="list-style-type: none">SafetyMobilityProductivityEfficiencyEnergy & EnvironmentCustomer Satisfaction	<ul style="list-style-type: none">NebraskaNevadaNew HampshireNew JerseyNew MexicoNew YorkNorth CarolinaNorth DakotaOhioOklahomaOregon

[Clear selections](#) [Clear selections](#) [Clear selections](#)



RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION

INTELLIGENT TRANSPORTATION SYSTEMS

About RITA

Communities of Interest

Contact Us

Press Room

RITA Offices

Site Map

Search

Benefits Database

Browse Benefits By

Benefit of the Month

ITS Knowledge Resources

[ITS](#) >> [Benefits Database](#) >> Search Results

Need assistance? [Contact us](#) or view the [Help page](#).

Search for: in Benefits

Quick Links:

Search Results (2 unique benefit summaries found)

>> Crash Prevention & Safety

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)

[Subscribe to New Benefits Entries RSS Feed](#) | [View all available RSS Feeds](#) | [What is RSS?](#) | [Subscribe via e-mail](#)

Research and Innovative Technology Administration (RITA) • U.S. Department of Transportation (US DOT)
1200 New Jersey Avenue, SE • Washington, DC 20590 • 800-853-1351 • [E-mail RITA](#)

[Accessibility](#) | [Disclaimer](#) | [Fast Lane](#) | [FedStats](#) | [Freedom of Information Act](#) | [No FEAR Act](#) | [OIG Hotline](#) | [Privacy Policy](#) | [RSS](#) | [USA.gov](#) | [White House](#) | [Wireless](#)

Plug-ins: [PDF Reader](#) | [Flash Player](#) | [Excel Viewer](#) | [PowerPoint Viewer](#) | [Word Viewer](#) | [WinZip](#)

[About RITA](#)[Communities of Interest](#)[Contact Us](#)[Press Room](#)[RITA Offices](#)[Site Map](#) [Benefits Database](#)[Browse Benefits By](#)[Benefit of the Month](#)[ITS Knowledge Resources](#)[ITS](#) >> [Benefits Database](#) >> [Search](#) >> SummaryNeed assistance? [Contact us](#) or view the [Help page](#).Search for: in [Benefits](#) Quick Links:     

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

31 October 2006
Colorado, Oregon, USA

[E-mail](#) | [Post a Comment](#) | [Print](#)

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 [Post a Comment](#)

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.](#)

Source

[CVO/Freight and ITS Session \(Presentation\)](#)

Author: Drakopoulos, Alex (Marquette University)

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

Source Date: 31 October 2006

URL: http://www.smartways.org/meetings/2006ITSForum/presentations/3_Drakopoulos_CVSafety.pdf





Application Areas

[Intelligent Infrastructure](#) > [Crash Prevention & Safety](#) > [Road Geometry Warning](#) > [Downhill Speed Warning](#)

Goal Areas

[Safety](#)

Typical Deployment Locations

Rural Areas

Keywords

None defined

ID: 2008-00513

 [Subscribe to New Benefits Entries RSS Feed](#) | [View all available RSS Feeds](#) | [What is RSS?](#) |  [Subscribe via e-mail](#)

[Research and Innovative Technology Administration \(RITA\)](#) • [U.S. Department of Transportation \(US DOT\)](#)
1200 New Jersey Avenue, SE • Washington, DC 20590 • 800-853-1351 • [E-mail RITA](#)

[Accessibility](#) | [Disclaimer](#) | [Fast Lane](#) | [FedStats](#) | [Freedom of Information Act](#) | [No FEAR Act](#) | [OIG Hotline](#) | [Privacy Policy](#) | [RSS](#) | [USA.gov](#) | [White House](#) | [Wireless](#)

Plug-ins: [PDF Reader](#) | [Flash Player](#) | [Excel Viewer](#) | [PowerPoint Viewer](#) | [Word Viewer](#) | [WinZip](#)

Benefits Database

Browse Benefits By

Benefit of the Month

ITS Knowledge Resources

ITS >> Benefits Database >> Home

Search for: in Benefits

- Application
- Goal Area
- State
- Country
- Integration Links

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links: [A](#) [B](#) [C](#) [DS](#) [LL](#)

Search Benefits by Applications:

[Application Definitions](#) [Database Help](#)

Intelligent Infrastructure



Arterial Management



Freeway Management



Crash Prevention & Safety



Road Weather Management



Roadway Operations & Maintenance



Transit Management



Transportation Management Centers



Traffic Incident Management



Emergency Management



Electronic Payment & Pricing



Traveler Information



Information Management



Commercial Vehicle Operations



Intermodal Freight

Intelligent Vehicles



Collision Avoidance



Driver Assistance



Collision Notification

Search Benefits by Classification(s):

[How to search by classification](#)

Select one or more items from the classifications areas ([show classification area descriptions](#))

Application Areas

Goal Areas

States & Countries

- Arterial Management
- Freeway Management
- Crash Prevention & Safety
- Road Weather Management
- Roadway Operations & Maintenance
- Transit Management
- Transportation Management Centers
- Traffic Incident Management
- Emergency Management
- Electronic Payment & Pricing
- Traveler Information

- Safety
- Mobility
- Productivity
- Efficiency
- Energy & Environment
- Customer Satisfaction

- USA
- STATES**
- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware

Find

[Clear selections](#)

[Clear selections](#)

[Clear selections](#)

About RITA

Communities of Interest

Contact Us

Press Room

RITA Offices

Site Map

Search

Benefits Database

Browse Benefits By

Benefit of the Month

ITS Knowledge Resources

ITS >> [Benefits Database](#) >> View by Application

Need assistance? [Contact us](#) or view the [Help page](#).

Search for: in Benefits

Quick Links:     

View by Application

[Application Definitions](#)

Intelligent Infrastructure



Arterial Management



Freeway Management



Crash Prevention & Safety



Road Weather Management



Roadway Operations & Maintenance



Transit Management



Transportation Management Centers



Traffic Incident Management



Emergency Management



Electronic Payment & Pricing



Traveler Information



Information Management



Commercial Vehicle Operations



Intermodal Freight

Intelligent Vehicles



Collision Avoidance



Driver Assistance



Collision Notification

 [Subscribe to New Benefits Entries RSS Feed](#) | [View all available RSS Feeds](#) | [What is RSS?](#) |  [Subscribe via e-mail](#)

Research and Innovative Technology Administration (RITA) • U.S. Department of Transportation (US DOT)
1200 New Jersey Avenue, SE • Washington, DC 20590 • 800-853-1351 • [E-mail RITA](#)

[Accessibility](#) | [Disclaimer](#) | [Fast Lane](#) | [FedStats](#) | [Freedom of Information Act](#) | [No FEAR Act](#) | [OIG Hotline](#) | [Privacy Policy](#) | [RSS](#) | [USA.gov](#) | [White House](#) | [Wireless](#)

Plug-ins: [PDF Reader](#) | [Flash Player](#) | [Excel Viewer](#) | [PowerPoint Viewer](#) | [Word Viewer](#) | [WinZip](#)

[ITS](#) >> [Benefits Database](#) >> [View by Application](#) >> Road Weather Management

Search for: in Benefits 

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links:     



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 2006)

[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)

[Final Report of the FORETELL Consortium Operational Test: Weather Information for Surface Transportation](#) (April 2003)

[Idaho Storm Warning System Operational Test - Final Report](#) (14 March 2001)

[Benefits Database](#)[Browse Benefits By](#)[Benefit of the Month](#)[ITS Knowledge Resources](#)[ITS](#) >> [Benefits Database](#) >> [Home](#)Search for: in [Benefits](#)[Application](#)
[Goal Area](#)
[State](#)
[Country](#)
[Integration Links](#)Need assistance? [Contact us](#) or view the [Help page](#).Quick Links: [AO](#) [B](#) [C](#) [DS](#) [LL](#)

Search Benefits by Applications:

[Application Definitions](#) [Database Help](#)

Intelligent Infrastructure



Arterial Management



Freeway Management



Crash Prevention & Safety



Road Weather Management



Roadway Operations & Maintenance



Transit Management



Transportation Management Centers



Traffic Incident Management



Emergency Management



Electronic Payment & Pricing



Traveler Information



Information Management



Commercial Vehicle Operations



Intermodal Freight

Intelligent Vehicles



Collision Avoidance



Driver Assistance



Collision Notification

Search Benefits by Classification(s):

[How to search by classification](#)Select one or more items from the classifications areas ([show classification area descriptions](#))

Application Areas

[Arterial Management](#)
[Freeway Management](#)
[Crash Prevention & Safety](#)
[Road Weather Management](#)
[Roadway Operations & Maintenance](#)
[Transit Management](#)
[Transportation Management Centers](#)
[Traffic Incident Management](#)
[Emergency Management](#)
[Electronic Payment & Pricing](#)
[Traveler Information](#)[Clear selections](#)

Goal Areas

[Safety](#)
[Mobility](#)
[Productivity](#)
[Efficiency](#)
[Energy & Environment](#)
[Customer Satisfaction](#)[Clear selections](#)

States & Countries

USA
STATES
[Alabama](#)
[Alaska](#)
[Arizona](#)
[Arkansas](#)
[California](#)
[Colorado](#)
[Connecticut](#)
[Delaware](#)[Clear selections](#)

Benefits Database

Browse Benefits By

Benefit of the Month

ITS Knowledge Resources

What's New

About This Site

FAQ

Available Documents

Links

Contact Us

Contribute Data

Help

Search for:

Go

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links: [AO](#) [B](#) [C](#) [DS](#) [LL](#)

Search Be

[Application Definitions](#) [Database Help](#)

Intelligent Infrastructure



Arterial Management



Freeway Management



Crash Prevention & Safety



Road Weather Management



Roadway Operations & Maintenance



Transit Management



Transportation Management Centers



Traffic Incident Management



Emergency Management



Electronic Payment & Pricing



Traveler Information



Information Management



Commercial Vehicle Operations



Intermodal Freight

Intelligent Vehicles



Collision Avoidance



Driver Assistance



Collision Notification

Search Benefits by Classification(s):

[How to search by classification](#)

Select one or more items from the classifications areas ([show classification area descriptions](#))

Application Areas

- Arterial Management
- Freeway Management
- Crash Prevention & Safety
- Road Weather Management
- Roadway Operations & Maintenance
- Transit Management
- Transportation Management Centers
- Traffic Incident Management
- Emergency Management
- Electronic Payment & Pricing
- Traveler Information

Goal Areas

- Safety
- Mobility
- Productivity
- Efficiency
- Energy & Environment
- Customer Satisfaction

States & Countries

- USA
- STATES**
- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware

Find

Benefits Database

Browse Benefits By

Benefit of the Month

ITS Knowledge Resources

ITS >> Benefits

Search for:

- What's New
- About This Site
- FAQ
- Available Documents
- Links
- Contact Us
- Contribute Data
- Help

Go

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links: [AO](#) [B](#) [C](#) [DS](#) [LL](#)

[Application Definitions](#) [Database Help](#)

Search Be

Intelligent Infrastructure

 Arterial Management	 Freeway Management	 Crash Prevention & Safety	 Road Weather Management	 Roadway Operations & Maintenance	 Transit Management	 Transportation Management Centers
 Traffic Incident Management	 Emergency Management	 Electronic Payment & Pricing	 Traveler Information	 Information Management	 Commercial Vehicle Operations	 Intermodal Freight

Intelligent Vehicles

 Collision Avoidance	 Driver Assistance	 Collision Notification
--	--	---

Search Benefits by Classification(s):

[How to search by classification](#)

Select one or more items from the classifications areas ([show classification area descriptions](#))

Application Areas	Goal Areas	States & Countries
<ul style="list-style-type: none"> Arterial Management Freeway Management Crash Prevention & Safety Road Weather Management Roadway Operations & Maintenance Transit Management Transportation Management Centers Traffic Incident Management Emergency Management Electronic Payment & Pricing Traveler Information 	<ul style="list-style-type: none"> Safety Mobility Productivity Efficiency Energy & Environment Customer Satisfaction 	USA STATES Alabama Alaska Arizona Arkansas California Colorado Connecticut Delaware Florida Georgia Hawaii Idaho Illinois Indiana Iowa Kansas Kentucky Louisiana Maine Maryland Massachusetts Michigan Minnesota Missouri Montana Nebraska Nevada New Hampshire New Jersey New Mexico New York North Carolina North Dakota Ohio Oklahoma Oregon Pennsylvania Rhode Island South Carolina South Dakota Tennessee Texas Utah Vermont Virginia Washington West Virginia Wisconsin Wyoming
<p>Find</p>		



Tour: Costs Database

RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION
INTELLIGENT TRANSPORTATION SYSTEMS

About RITA
Communities of Interest
Contact Us
Press Room
RITA Offices
Site Map
Search

Costs Database
Unit Costs
System Costs By
ITS Knowledge Resources

ITS >> [Costs Database](#) >> [Home](#)

Search for:

in
Costs
Go

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links:
AO
B
C
DS
LL

Unit Costs

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.

[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](#)

Search Costs by Applications: [Application Definitions](#) [Database Help](#)

Intelligent Infrastructure

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

Traffic Incident Management	Emergency Management	Electronic Payment & Pricing	Traveler Information	Information Management	Commercial Vehicle Operations	Intermodal Freight

Intelligent Vehicles

Collision Avoidance	Driver Assistance	Collision Notification

22

ITS >> [Costs Database](#) >> Home

Need assistance? [Contact us](#) or view the [Help page](#).

Search for: in Costs

Quick Links:

Unit Costs

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.

[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](#)

Search Costs by Applications:

[Application Definitions](#) [Database Help](#)

Intelligent Infrastructure



Arterial Management



Freeway Management



Crash Prevention & Safety



Road Weather Management



Roadway Operations & Maintenance



Transit Management



Transportation Management Centers



Traffic Incident Management



Emergency Management



Electronic Payment & Pricing



Traveler Information



Information Management



Commercial Vehicle Operations



Intermodal Freight

Intelligent Vehicles



Collision Avoidance



Driver Assistance



Collision Notification

[ITS](#) >> [Costs Database](#) >> [View by Application](#) >> Crash Prevention & Safety

Need assistance? [Contact us](#) or view the [Help page](#).

Search for: in [Costs](#) 

Quick Links:     



Crash Prevention & Safety (19 unique system cost summaries found)

Road Geometry Warning

 [View Related Cost Data](#)

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 \\$8.2 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

[View Related Cost Data](#)

[The annualized life-cycle costs for full ITS deployment and operations in Tucson were estimated at \\$72.1 million.](#) (May 2005)

[ITS](#) >> [Costs Database](#) >> Taxonomy Category

Search for: in

 [Printer friendly version](#)

Unadjusted Costs

Adjusted Costs

Indexes

Download Excel

Download PDF

Data Sources

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links:     

Crash Prevention & Safety

Road Geometry Warning

Relevant Unit Cost Subsystems:

Unadjusted

[Roadside Telecommunications \(RS-TC\)](#)

[Roadside Detection \(RS-D\)](#)

[Roadside Information \(RS-I\)](#)

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 \\$446,687.](#)

In Colorado, a Truck Tip-Over Warning System was deployed on I-70 east bound just outside Idaho... (31 October 2006)

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

A truck speed warning system was deployed on a downgrade curve along I-70 in Glenwood Canyon... (November 2001)

[Based on a nationwide survey of states operating overhead 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 overhead detection and warning system installed at both approaches to a bridge would cost \\$110,000.](#)

This summary presents the cost analysis of an active overhead 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.](#)

About RITA

Communities of Interest

Contact Us

Press Room

RITA Offices

Site Map

Search

Costs Database

Unit Costs

System Costs By

ITS Knowledge Resources

[ITS](#) >> [Costs Database](#) >> [Search](#) >> Summary

Need assistance? [Contact us](#) or view the [Help page](#).

Search for: in Costs 

Quick Links:     

In Colorado, a Truck Tip-Over Warning System was deployed on I-70 at a cost of \$446,687.

31 October 2006
Colorado, USA

[E-mail](#) | [Post a Comment](#) | [Print](#)

Summary Information

In Colorado, a Truck Tip-Over Warning System was deployed on I-70 east bound 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.

EQUIPMENT LIST - MAJOR COMPONENTS OF BID TAB*	COST
Truck Tip Over Warning System (Ea.) (WIM)	\$278,611
Blank Out Sign (Fiber Optic) (4 Ea.x 8,788 \$/ea.)	\$35,112
Steel Sign Post (W 6x12) (39.5 lf x 23 \$/lf)	\$908
Steel Sign Post (W 8x18) (33 lf x 32 \$/lf)	\$891
Concrete Footing (Type 3) (3 ea x 976 \$/ea)	\$2,928
Concrete Footing (Type 1) (2 ea x 941 \$/ea)	\$1,882

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

Comments [Post a Comment](#)

No comments posted to date

Benefits From This Source

Source

[CVO/Freight and ITS Session \(Presentation\)](#)

Author: Drakopoulos, Alex (Marquette University)

"Design Guidelines for Including ITS in Projects," Colorado DOT CoTrip, Web site URL <http://www.cotrip.org/its/ITS%20Guidelines%20Web%20New%20Format%202-05/Web%20Solutions%20Packages/Truck%20Overturn%20Speed%20Advisory%20System.xls>. Last Accessed 2 February 2008

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

Source Date: 31 October 2006

URL: http://www.smartways.org/meetings/2006ITSForum/pre-sentations/3_Drakopoulos_CVSafety.pdf

System Cost

System Cost: \$446,687 (2002).

[About RITA](#)[Communities of Interest](#)[Contact Us](#)[Press Room](#)[RITA Offices](#)[Site Map](#) [Costs Database](#)[Unit Costs](#)[System Costs By](#)[ITS Knowledge Resources](#)[ITS](#) >> [Costs Database](#) >> Unit Costs (Unadjusted)

Unadjusted Costs

Adjusted Costs

Indexes

Download Excel

Download PDF

Data Sources

Need assistance? [Contact us](#) or view the [Help page](#).

Search for:

in

Costs

Quick Links:     

Unit Costs (Unadjusted) - View by

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.

[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 \(TA\)](#)

[ITS](#) >> [Costs Database](#) >> [Unit Costs \(Unadjusted\) - View by Subsystem](#) >> Remote

Location (RM)

Need assistance? [Contact us](#) or view the [Help page](#).

Search for: in Costs 

Quick Links:     

 [Printer friendly version](#)

Unit Costs (Unadjusted) [\(View Adjusted\)](#)

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.

Unit Cost Element	IDAS #	Life Years	Capital Cost \$K (Source Year)	O&M Cost \$K/year (Source Year)	Description
CCTV Camera	RM001	7	2 - 5 (2005)	0.1 - 0.24 (2004)	Interior fixed mount camera for security. Low cost represents black & white pan/tilt/zoom (PTZ). High cost represents color PTZ. Does not include installation.
Integration of Camera with Existing Systems	RM002	10	2 - 2.5 (1995)		Per location.
Informational Kiosk	RM003	7	11 - 24 (2004)	1.2 - 5 (1998)	Includes hardware, enclosure, installation, modem server, and map software.
Integration of Kiosk with Existing Systems	RM004	7	2.1 - 26.1 (2005)		Software costs are for COTS (low) and developed/outdoor (high).
Kiosk Upgrade for Interactive Usage	RM005	5	5 - 8 (1995)	0.5 - 0.8 (1995)	Interactive information display interface (upgrade from existing interface).
Kiosk Software Upgrade for Interactive Usage	RM006	5	10 - 12 (1995)		Software is COTS.
Transit Status Information Sign		10	4 - 8 (2005)		A LED display installed at transit terminal that provides status information on transit arrival. Cost depends on quality, size, and controller capabilities.
Smart Card Vending Machine	RM007	5	37 - 40 (1995)	1.85 - 2 (1995)	Ticket vending machine for smart card.
Software, Integration for Smart Card Vending	RM008	20	3 - 5 (1995)		Software is COTS.

[ITS](#) >> [Costs Database](#) >> [Unit Costs \(Adjusted\)](#) -Search for:

in

Costs

- Unadjusted Costs
- Adjusted Costs
- Indexes
- Download Excel
- Download PDF
- Data Sources

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links:



Unit Costs (Adjusted) - View by S

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.

[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 \(EC\)/Administration](#)[Commercial Vehicle Safety Information Exchange \(SIE\)](#)[Commercial Vehicle Electronic Screening \(ES\) \(Preclearance\)](#)[Commercial Vehicle On-Board \(CV\)](#)[Fleet Management Center \(FM\)](#)[Vehicle On-Board \(VS\)](#)[Personal Devices \(PD\)](#)

[ITS](#) >> [Costs Database](#) >> [Unit Costs \(Adjusted\) - View by Subsystem](#) >> Remote

Location (RM)

Search for: in Costs 

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links:     

 [Printer friendly version](#)

Unit Costs (Adjusted) [\(View Unadjusted\)](#)

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.

Unit Cost Element	IDAS #	Life Years	Capital Cost \$K, 2007 Dollars (Source Year)	O&M Cost \$K/year, Dollars (Source Year)	Description
CCTV Camera <i>Index: 2</i>	RM001	7	2 - 5 (2005)	0.10 - 0.22 (2004)	Interior fixed mount camera for security. Low cost represents black & white pan/tilt/zoom (PTZ). High cost represents color PTZ. Does not include installation.
Integration of Camera with Existing Systems <i>Index: 3</i>	RM002	10	2 - 2.5 (1995)		Per location.
Informational Kiosk <i>Index: 2</i>	RM003	7	10 - 22 (2004)	1 - 4.1 (1998)	Includes hardware, enclosure, installation, modem server, and map software.
Integration of Kiosk with Existing Systems <i>Index: 3</i>	RM004	7	2.2 - 26.9 (2005)		Software costs are for COTS (low) and developed/outdoor (high).
Kiosk Upgrade for Interactive Usage <i>Index: 3</i>	RM005	5	5 - 8 (1995)	0.5 - 0.8 (1995)	Interactive information display interface (upgrade from existing interface).
Kiosk Software Upgrade for Interactive Usage <i>Index: 3</i>	RM006	5	10 - 12 (1995)		Software is COTS.
Transit Status Information Sign <i>Index: 2</i>		10	4 - 8 (2005)		A LED display installed at transit terminal that provides status information on transit arrival. Cost depends on quality, size, and controller capabilities.
Smart Card Vending Machine <i>Index: 2</i>	RM007	5	27 - 29 (1995)	1.3 - 1.4 (1995)	Ticket vending machine for smart card.
Software, Integration for Smart Card Vending <i>Index: 3</i>	RM008	20	3 - 5 (1995)		Software is COTS.



Tour: Lessons Learned Knowledge Resource

The screenshot shows the RITA (Research and Innovative Technology Administration) website's "Lessons Learned" section. The header includes the RITA logo and the text "INTELLIGENT TRANSPORTATION SYSTEMS". Navigation tabs include "About RITA", "Communities of Interest", "Contact Us", "Press Room", "RITA Offices", and "Site Map". A search bar is present with a "Search" button. Below the navigation, there are dropdown menus for "Lessons Learned", "Browse Lessons By", "Lesson of the Month", and "ITS Knowledge Resources". A search input field is labeled "Search for:" with a "Go" button. A "Need assistance? Contact us or view the Help page." link is provided. "Quick Links" for Adobe, Blackboard, Canvas, and LMS are shown. The main content area is divided into two sections: "Search Lessons by Lesson Category:" and "Search Lessons by Classification(s):". The "Lesson Category" section features icons for Management & Operations, Policy & Planning, Design & Deployment, Leadership & Partnerships, Funding, Technical Integration, Procurement, Legal Issues, and Human Resources. The "Classification(s)" section includes four dropdown menus: Lesson Categories, Application Areas, Goal Areas, and States & Countries. A "Find" button is located to the right of the States & Countries dropdown. A note at the bottom of the classification section reads: "Use the Ctrl (or Command) key to select/deselect multiple items within a classification area. Use the Refresh icon found underneath the classification area box to clear all selections in a classification area." At the bottom of the page, there is a "Privacy Statement" link, a "Subscribe to New Lesson Learned Knowledge Resource Entries RSS Feed" link, and a "Subscribe via e-mail" link. The footer contains the RITA address and contact information, as well as various accessibility and legal links.



[ITS](#) >> [Lessons Learned](#) >> HomeNeed assistance? [Contact us](#) or view the [Help page](#).Search for: in [Lessons](#) Quick Links: [AO](#) [B](#) [C](#) [DS](#) [LL](#)

Search Lessons by Lesson Category:

[How to search by lesson category](#)Select a lesson category ([show subcategories](#))

Management & Operations



Policy & Planning



Design & Deployment



Leadership & Partnerships



Funding



Technical Integration



Procurement



Legal Issues



Human Resources

Focused Search

Search Lessons by Classification(s):

[How to search by classification](#)Select one or more items from the classifications areas ([show classification area descriptions](#))

Lesson Categories

- Management & Operations
- Policy & Planning
- Design & Deployment
- Leadership & Partnerships
- Funding
- Technical Integration
- Procurement
- Legal Issues
- Human Resources

[Clear selections](#)

Application Areas

- Arterial Management
- Freeway Management
- Crash Prevention & Safety
- Road Weather Management
- Roadway Operations & Maintenance
- Transit Management
- Transportation Management Center
- Traffic Incident Management
- Emergency Management
- Electronic Payment & Pricing
- Traveler Information

[Clear selections](#)

Goal Areas

- Safety
- Mobility
- Productivity
- Efficiency
- Energy & Environment
- Customer Satisfaction

[Clear selections](#)

States & Countries

- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Puerto Rico
- Rhode Island
- South Carolina
- South Dakota

[Clear selections](#)

Use the **Ctrl** (or **Command**) key to select/deselect multiple items within a classification area.
Use the **Refresh** icon found underneath the classification area box to clear all selections in a classification area

Search for: in [Lessons](#) Quick Links:     

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

Management & Operations [top](#)

Operations

- [Install Automatic Vehicle Location \(AVL\) technology to greatly enhance transit agency performance.](#)
Different transit agencies' experiences with AVL.
- [Provide traveler information in rural areas to allow for good travel decisions in inclement weather and construction season.](#)
Oregon DOTs experience with rural traveler information systems.

Maintenance

- [Install Automatic Vehicle Location \(AVL\) technology to greatly enhance transit agency performance.](#)
Different transit agencies' experience with AVL.
- [Provide traveler information in rural areas to allow for good travel decisions in inclement weather and construction season.](#)
Oregon DOTs experience with rural traveler information systems.

System Data & Storage

- [Install Automatic Vehicle Location \(AVL\) technology to greatly enhance transit agency performance.](#)
Different transit agencies' experience with AVL.
- [Recognize issues in deploying ITS technologies for coordinating and improving Human Services Transportation.](#)
Experiences from six agencies.

Policy & Planning [top](#)

Planning

Search for: in [Lessons](#) Quick Links: [AO](#) [B](#) [C](#) [DS](#) [LL](#)

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 state wide 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

URL: http://www.itsdocs.fhwa.dot.gov/PODOCS/REPTS_TE/13477.html

[Other Lessons From this Source](#)

Contacts

Lesson Contact(s):

Aimee Flannery, Ph.D., P.E.
George Mason University
703-993-1738
aflanner@gmu.edu

Lesson Analyst:

Firoz Kabir
Noblis
202-863-2987
firoz.kabir@noblis.org

Lessons Learned | **Browse Lessons By** | **Lesson of the Month** | **ITS Knowledge Resources**

[ITS >> Lessons Learned >> Home](#)

Search for: in Lessons

Search Lessons by Lesson Category

Select a lesson category ([show subcategories](#))

- Management & Operations
- Policy & Planning
- Design & Deployment
- Leadership & Partnerships
- Funding

Browse Lessons By

- Lesson Category
- Synthesis of Lessons
- Application Area
- Goal Area
- State
- Country
- Systems Engineering
- Major Initiatives
- Other Program Activities

Lesson of the Month

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links: [AO](#) [B](#) [C](#) [DS](#) [LL](#)

[How to search by lesson category](#)

ITS Knowledge Resources

- Technical Integration
- Procurement
- Legal Issues
- Human Resources

Search Lessons by Classification(s): [How to search by classification](#)

Select one or more items from the classifications areas ([show classification area descriptions](#))

Lesson Categories

- Management & Operations
- Policy & Planning
- Design & Deployment
- Leadership & Partnerships
- Funding
- Technical Integration
- Procurement
- Legal Issues
- Human Resources

[Clear selections](#)

Application Areas

- Arterial Management
- Freeway Management
- Crash Prevention & Safety
- Road Weather Management
- Roadway Operations & Maintenance
- Transit Management
- Transportation Management
- Traffic Incident Management
- Emergency Management
- Electronic Payment & Pricing
- Traveler Information

[Clear selections](#)

Goal Areas

- Safety
- Mobility
- Productivity
- Efficiency
- Energy & Environment
- Customer Satisfaction

[Clear selections](#)

States & Countries

- USA
- STATES**
- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware

[Clear selections](#)

*Use the Ctrl (or Command) key to select/deselect multiple items within a classification area
Use the Refresh icon found underneath the classification area box to clear all selections in a classification area*

[About RITA](#) |
 [Communities of Interest](#) |
 [Contact Us](#) |
 [Press Room](#) |
 [RITA Offices](#) |
 [Site Map](#) |

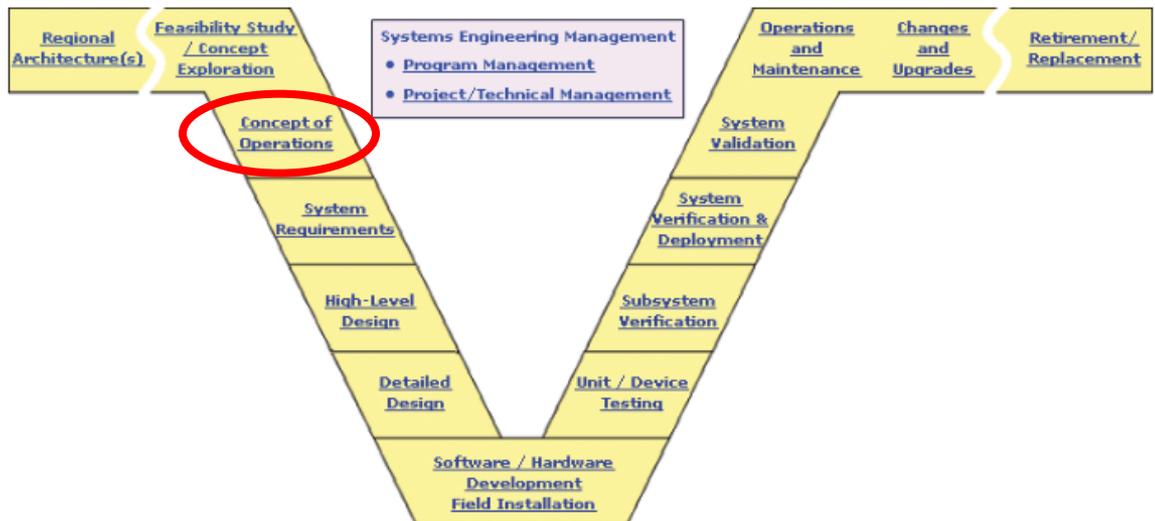
[Lessons Learned](#) |
 [Browse Lessons By](#) |
 [Lesson of the Month](#) |
 [ITS Knowledge Resources](#)

[ITS >> Lessons Learned >> Systems Engineering Activities](#)
 Search for: in Lessons

Systems Engineering Activities
 Click on the activities in the "V" below to view related lessons

Lesson Category
Synthesis of Lessons
Application Area
Goal Area
State
Country
Systems Engineering
Major Initiatives
Other Program Activities

Need assistance? [Contact us](#) or view the [Help page](#).
 Quick Links: [A0](#) [B](#) [C](#) [DS](#) [LL](#)
[Systems Engineering Activities Definitions](#) | [Resources](#)



Resources:

- Systems Engineering for Intelligent Transportation Systems: An Introduction for Transportation Professionals** Federal Highway Administration, January, 2007
<http://ops.fhwa.dot.gov/publications/seitsguide/index.htm>
 Cost: Free
- Florida's Statewide Systems Engineering Management Plan, Version 2**, Florida Department of Transportation, March 2005
<http://www.floridaitis.com/SEMP/index.htm>
 Cost: Free
- California's Systems Engineering Guidebook for ITS, Version 2**, California Department of Transportation, January 2007

ITS >> [Lessons Learned](#) >> [View by Systems Engineering Activities](#) >> Concept of Operations

Need assistance? [Contact us](#) or view the [Help page](#).

Search for: in Lessons 

Quick Links:     

▼ Concept of Operations (116 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](#)

- [Strengthen 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 9-1-1.](#)
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 Dutchess 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 TDM 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 2007 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 nationwide in the successful use of the transportation network in emergency evacuations with advance notice.



Example Case Study



*Source: Low-Cost Treatments for Horizontal Curve Safety, December 2006.
Picture courtesy of Caltrans*

- 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



Example Case Study: Benefits

RITA RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION
INTELLIGENT TRANSPORTATION SYSTEMS

Navigation: About RITA | Communities of Interest | Contact Us | Press Room | RITA Offices | Site Map | Search

Benefits Database | Browse Benefits By | Benefit of the Month | ITS Knowledge Resources

ITS >> [Benefits Database](#) >> Home

Search for: in Benefits

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links: [AO](#) [B](#) [C](#) [DS](#) [LL](#)

Search Benefits by Applications: [Application Definitions](#) [Database Help](#)

Intelligent Infrastructure

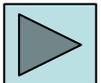
- Arterial Management
- Freeway Management
- Crash Prevention & Safety
- Road Weather Management
- Roadway Operations & Maintenance
- Transit Management
- Transportation Management Centers

Intelligent Vehicles

- Traffic Incident Management
- Emergency Management
- Electronic Payment & Pricing
- Traveler Information
- Information Management
- Commercial Vehicle Operations
- Intermodal Freight

Intelligent Vehicles

- Collision Avoidance
- Driver Assistance
- Collision Notification





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

[E-mail](#) | [Post a Comment](#) | [Print](#)

Summary Information

A truck speed warning system was deployed on a downgrade curve along I-70. The curve tightens from 7 to 5 degrees. This stretch of roadway had been detected (via radar) exceeding the posted speed, then the truck's speed is detected. The system displays a 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

[The cost to equip a police vehicle in Dane County, Wisconsin for coordinated interagency incident response was \\$8,000 to \\$10,000.](#)

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

About RITA ▾
Communities of Interest ▾
Contact Us ▾
Press Room ▾
RITA Offices ▾
Site Map ▾

Lessons Learned ▾
Browse Lessons By ▾
Lesson of the Month
ITS Knowledge Resources ▾

[ITS](#) >> [Lessons Learned](#) >> [Search](#) >> Summary

Search for: in Lessons ▾

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links: [A](#) [B](#) [C](#) [DS](#) [LL](#)

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 [\(Hide\)](#)

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 [\(Hide\)](#)

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

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

URL: http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/13477.html

[Other Lessons From this Source](#)



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?



Audience Participation Activity Instructions

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!**



Audience Participation Activity Instructions

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

RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION
INTELLIGENT TRANSPORTATION SYSTEMS

[About RITA](#) | [Communities of Interest](#) | [Contact Us](#) | [Press Room](#) | [RITA Offices](#) | [Site Map](#) |

[Benefits Database](#) | [Browse Benefits By](#) | [Benefit of the Month](#) | [ITS Knowledge Resources](#)

[ITS >> Benefits Database >> Home](#)

Search for: in [Benefits](#)

Need assistance? [Contact us](#) or view the [Help page](#).

Quick Links: [AO](#) [B](#) [C](#) [DS](#) [LL](#)

Search Benefits by Applications:
[Application Definitions](#) [Database Help](#)

Intelligent Infrastructure

Arterial Management

Freeway Management

Crash Prevention & Safety

Road Weather Management

Roadway Operations & Maintenance

Transit Management

Transportation Management Centers

Traffic Incident Management

Emergency Management

Electronic Payment & Pricing

Traveler Information

Information Management

Commercial Vehicle Operations

Intermodal Freight

Intelligent Vehicles

Collision Avoidance

Driver Assistance

Collision Notification

Search Benefits by Classification(s):
[How to search by classification](#)

Select one or more items from the classifications areas ([show classification area descriptions](#))

Application Areas	Goal Areas	States & Countries
<ul style="list-style-type: none"> Arterial Management Freeway Management Crash Prevention & Safety Road Weather Management Roadway Operations & Maintenance Transit Management Transportation Management Centers Traffic Incident Management Emergency Management Electronic Payment & Pricing Traveler Information 	<ul style="list-style-type: none"> Safety Mobility Productivity Efficiency Energy & Environment Customer Satisfaction 	<ul style="list-style-type: none"> USA STATES Alabama Alaska Arizona Arkansas California Colorado Connecticut Delaware
Clear selections	Clear selections	Clear selections

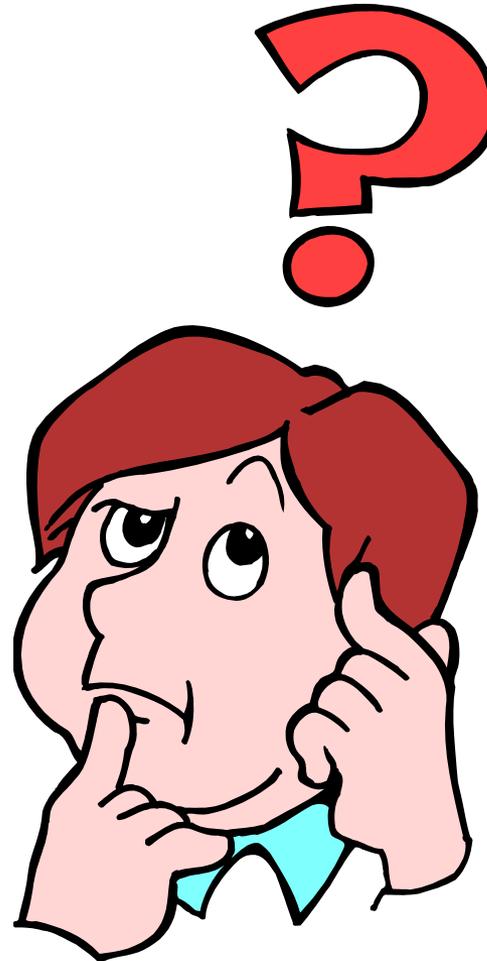


Using ITS Decisionmakers' Resources: Recap

- ITS Applications Overview
 - www.itsoverview.its.dot.gov
- ITS Benefits Database
 - www.itsbenefits.its.dot.gov
- ITS Costs Database
 - www.itscosts.its.dot.gov
- ITS Deployment Tracking Database
 - www.itsdeployment.its.dot.gov
- ITS Lessons Learned Knowledge Resource
 - www.itslessons.its.dot.gov



Any Last Questions?





Contact Information

- Greg Hatcher, Manager, Transportation Systems
 - gatcher@noblis.org
- Cheryl Lowrance, Principal Engineer, Transportation Systems
 - cheryl.lowrance@noblis.org