Monitoring and Sharing the Impacts of ITS for Decision Support: US Perspective

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TOPICS

• Background
• Resources
• Lesson Learned
ITS Knowledge Resources: Integrated Website and Databases

• Part of the USDOT’s ITS Evaluation Program

• One-of-a-kind collection of Web-based resources to assist decision makers, state and local government agencies, and researchers in understanding the benefits, costs, lessons learned, and extent of deployment of ITS.

• Websites supplemented by:
  • Outreach activities (webinars, presentations, etc.)
  • Publications such as a periodic Benefits, Costs, and Lessons Learned (BCLL) Update Report and articles
  • Periodic deployer surveys

http://www.itstkrs.its.dot.gov/
# ITS Knowledge Resources Evolution

<table>
<thead>
<tr>
<th>Year</th>
<th>Major New Feature</th>
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<tbody>
<tr>
<td>1995</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; (USDOT) ITS Benefits Report was published</td>
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<tr>
<td>1999</td>
<td>The ITS Knowledge Resources website first launched, with ITS benefits and unit costs databases</td>
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<tr>
<td>2003</td>
<td>ITS Deployment statistics survey data put online System Costs introduced</td>
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<tr>
<td>2005</td>
<td>The Lessons Learned Knowledge Resource database developed</td>
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<tr>
<td>2011</td>
<td>Interactive Asset Mapping Feature implemented</td>
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<tr>
<td>2013</td>
<td>Sample unit costs spreadsheets made available</td>
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<tr>
<td>2014</td>
<td>Interactive Benefits, Costs, and Lessons Learned Fact Sheets Launched</td>
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Who is the Target Audience?

- State, regional, and local transportation professionals seeking to consider ITS in the development of transportation plans and projects to address local transportation needs and problems.
- Non-transportation decisionmakers at all levels of government seeking to understand tradeoffs between ITS investment and other types of investment – are ITS investments worth it, as they compete with other funding/political priorities.
- Researchers or policymakers seeking to better understand the state of knowledge and extent of deployment of ITS, and learn about patterns of how technology in general, but ITS in particular, gets deployed over time.
- Private sector companies seeking to get a better understanding of market development and future direction.
- Academia: the databases are a vast repository of data that is useful for research purposes.
- Others.
International Data in the Knowledge Resources: Who’s Looking?

Source of Data

- United States, 86%
- United Kingdom
- Italy
- Singapore
- Denmark
- China
- Spain
- Netherlands
- France
- Taiwan
- South Korea
- Luxembourg
- Sweden
- Finland
- Australia
- Brazil
- Taiwan
- Ireland
- Japan
- Norway
- Belgium

Other, 14%
Resources
Knowledge Resources Portal

Welcome to DOT ITS Knowledge Resources

Intelligent transportation systems (ITS) provide a proven set of strategies for advancing transportation safety, mobility, and environmental sustainability by integrating communication and information technology applications into the management and operation of the transportation system across all modes. ITS technologies will transform surface transportation by offering a connected environment among vehicles, the infrastructure and passengers' wireless devices, allowing drivers to send and receive real-time information about potential hazards and road conditions.

This website presents information on the benefits, costs, deployment levels, and lessons learned regarding ITS deployment and operations. These Knowledge Resources were developed by the U.S. DOT's ITS Joint Program Office (JPO) evaluation program to support informed decision making regarding ITS investments by tracking the effectiveness of deployed ITS. The Knowledge Resources contain over fifteen years of summaries of the benefits, costs, lessons learned, and deployment status of specific ITS implementations, drawn primarily from written sources such as ITS evaluation studies, research syntheses, handbooks, journal articles, and conference papers.

Browse Resource Databases

BROWSE BENEFITS

Benefits measure the effects of ITS on transportation operations according to the six goals identified by the U.S. Department of Transportation (U.S. DOT): safety, mobility, efficiency, productivity, energy and environmental impacts, and customer satisfaction.
Knowledge Resources Portal – ITS Benefits Database

Objective

- Analyze and document ITS benefits
- Disseminate information about ITS benefits

Benefit Entries

- Provide summary of source document
- Provide methodology
- Provide results, findings, performance impacts, conclusions, etc.
  - Quantitative
  - Qualitative
- Direct link to source document

www.itsbenefits.its.dot.gov
Knowledge Resources Portal - ITS Costs Database

Objective

• Analyze and document the costs of deploying ITS
• Disseminate information about ITS costs

Costs Summary

• Unit Costs
  • Cost associated with an individual ITS element
  • Sample Unit Costs
• System Costs
  • Multiple ITS elements and typically represents the total project cost
• Costs summaries provide same level of detail as Benefit and Lessons Learned summaries
Knowledge Resources Portal – ITS Lessons Learned

**Objective**

- Gather and disseminate lessons learned from the experience of past ITS deployments

**Lessons Learned Entry**

- Provide summary of source document
- Provide Lessons for practitioners to consider when deploying projects
- Direct link to source document
- Provide contact information

[www.itslessons.its.dot.gov](http://www.itslessons.its.dot.gov)
Knowledge Resources Portal – ITS Deployment Statistics

• The ITS Deployment Tracking Project regularly surveys transportation agencies in the largest U.S. cities on a regular basis

• Most recent survey is 2013; data from previous survey years is also available.
• Next survey currently being conducted in 2016

• Deployment results organized by agency function
  • Freeway management
  • Arterial management
  • Transit management
  • TMC
  • Toll Collection
  • Fire and Rescue
  • Law Enforcement

www.itsdeployment.its.dot.gov
Using the Knowledge Resources to Support Deployment

1. Use the benefits database to find ITS solutions that will address your needs and will provide meaningful results.

2. Use the costs database to develop project cost estimates and conduct benefit/cost analysis.

3. Use the lessons learned database to find deployment guidance relevant to your desired system for easy and efficient implementation.
Bi-Annual Reporting
Benefits Cost Lessons Learned (BCLL)

http://www.itsknowledgeresources.its.dot.gov/its/bcllupdate/

Introduction
ITS Benefits, Costs, and Lessons Learned: 2014 Update Report

Introduction

In 2014, the U.S. transportation system faces the ongoing challenges of improving safety, meeting rising demand, and mitigating congestion and environmental impacts. Motor vehicle crashes continue to be the leading cause of death among Americans aged one to 34 years old, with the total societal cost of crashes exceeding $230 billion annually [1]. Fatalities from motor vehicle crashes rose 5.3 percent in 2012, the first time since 2005 that fatalities have gone up [2]. In 2011, congestion caused urban Americans to travel an extra 5.5 billion hours and to purchase an extra 2.9 billion gallons of fuel for a congestion cost of $121 billion, up one billion dollars from the year before and translating to 3618 per U.S. commuter [3]. The Texas Transportation Institute estimated the additional carbon dioxide (CO₂) emissions attributed to traffic congestion at 58 billion pounds — about 380 pounds per auto commuter [3].

ITS Leads the Way

Over the past 30 years, the demand for the use of public roads has increased approximately 96 percent, as measured in vehicle miles traveled (VMT). Over this same period the number of lane miles on public roads has increased less than 9 percent. These statistics indicate a sharp rise in demand while capacity, in terms of the number of lane miles, has stayed relatively constant [4].

Recognizing that we can no longer build our way out of these problems, transportation professionals have turned to information and communications technology for solutions. Intelligent Transportation Systems (ITS) provide a proven set of strategies for advancing transportation safety, mobility, and environmental sustainability by integrating communication and information technology applications into the management and operation of the transportation system across all modes. Connected vehicle technology has the potential to enable many services provided by infrastructure or vehicle based ITS by benefiting from enhanced communication between vehicles and the infrastructure.

The 2014 ITS Benefits, Costs and Lessons Learned Factsheets

This collection of factsheets presents information on the performance of deployed ITS, as well as information on the costs, and lessons learned regarding ITS deployment and operations. The factsheets, and the collection of three Web-based resources upon which it is based, have been developed by the ITS Joint Program Office (JPO) of the U.S. Department of Transportation (U.S. DOT) to support informed decision making regarding ITS planning and deployment.
BCLL Interactive Graphs

- Colorado DOT’s comparison of two adaptive signal deployments, - 9 to 19%
- Smart Corridor experience in Atlanta, Georgia - 22%
- Experience developing adaptive signal control software to optimize traffic signal timing, - 3 to 53%
- Results of a real-time, decentralized traffic signal system pilot test in Pittsburgh, PA - 25%
- Experience with adaptive signal systems in Lee’s Summit, Missouri - 39%

Graph showing percentage improvements in:
- Travel Time Reduction (5)
- Increase in Average Speed (2)
- Fuel Consumption Reduction
- Emissions Reduction (2)
- Stop Reduction (4)
- Delay Reduction (3)
- Crash Reduction
Visually displays the location of certain types of ITS deployments across the U.S, providing a geographic picture of the status of ITS deployment.

- Includes GIS data regarding key ITS technologies such as cameras, messages signs, ramp meters, speed sensors, and roadway weather information systems.
- Zoomable down to intersection-level detail
- Over 75,000 assets in the database and growing…

http://www.itsassets.its.dot.gov/
Lessons Learned
U.S. Lessons Learned in Developing/Maintaining Knowledge Resources

• Be willing to commit time and resources to the knowledge initiative
  • Keeping the contents updated is key – but it’s not easy and takes commitment
  • Don’t “build it and forget it”
• Use a common classification system across resources and make it transparent to users
• Engage target users and stakeholders during development and maintenance/operations phases
  • Crucial to know what users want
  • Show them mock-ups and get their feedback
• Actively seek feedback from Users and non-Users, and do it often
• Market the resources regularly and provide training
U.S. Lessons Learned in Developing/Maintaining Knowledge Resources

- Design user interfaces for quick comprehension and communication of results
  - Your audience needs to find data quickly and doesn't have much time to assimilate information
- Provide “canned” presentation materials for users
- Be willing to provide interim results
  - Timely information is important
  - Shortcuts long cycles that occur before evaluation reports are published
- Seek to include a wide variety of sources, including briefings, interviews, conference presentations, etc.
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