Traveler Information
ITS Benefits, Costs, and Lessons Learned: 2017 Update Report

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Traveler Information
Pre-Trip Information
En-Route Information
Tourism & Events
Multimodal Traveler Information

Highlights

- Nearly 40 percent of all survey respondents and 50 percent of suburban respondents reported using at least one transit service that they did not usually use as a result of using a multi-modal trip planning tool.

- Over 75 percent of respondents indicated that television news was the best medium for information dissemination for planned roadway closure information.

- Using open source software and common data standards can help reduce the cost of integrating traffic information into a single system.

Introduction

This factsheet is based on past evaluation data contained in the ITS Knowledge Resources database at: www.itskrs.its.dot.gov. The database is maintained by the U.S. DOT's ITS JPO Evaluation Program to support informed decision making regarding ITS investments by tracking the effectiveness of deployed ITS. The factsheet presents benefits, costs and lessons learned from past evaluations of ITS projects.

A major goal of departments of transportation and transit agencies is to provide the best service possible to their users. One of the ways to provide improved service to road and transit users is through providing accurate and timely traveler information. Traveler information is important when traffic conditions are worse than normal, in weather conditions that affect service or road conditions, special events that may require detours or cause traffic volumes far above normal, and for work zones and road closures.

Providing the public with accurate and timely information on travel conditions is important because it may affect their choice of mode, route, and departure time. Road conditions due to weather may affect vehicle choice, while parking information at a transit station may lead someone to use a feeder bus or get dropped off at the station in order to avoid driving to an already full parking lot.

Traveler information can be provided both pre-trip and en-route through information dissemination via radio, television, Highway Advisory Radio (HAR), 511 websites and phone systems, other traveler information websites, mobile applications, and dynamic message signs (DMS). Each of the technologies has different benefits and costs, as well as different audiences (i.e., commuters, tourists, commercial vehicles, etc.). The next generation of en-route traveler information is in-vehicle traveler information through connected vehicle technologies and other "infotainment" applications. Some of these technologies are covered more specifically in the factsheets that focus on arterial, freeway, and transit management. This factsheet serves largely as an overview of traveler information.

The cost to implement a multimodal trip planner can range from $138,000 to more than $4 million, depending on the need to develop custom software and consolidate data feeds.

Benefits

Benefits of traveler information systems differ widely depending on the type of information provided, the medium through which the information is provided and the type of event that the public needs notification of (e.g. work zone, crash, inclement weather, etc.). Benefits presented below are a sample of benefits that can be found in the ITS Knowledge Resources Database.

A six-month test of in-vehicle systems in Washington State determined that users changed their travel routine once out of every 4.2 times they used the device. When diverting, the surveyed users indicated that they saved approximately 30 minutes in travel time (2012-00812).

Multimodal trip planners can be instrumental in encouraging individuals to use existing transit services. By incorporating information such as gas prices and transit fares, in addition to travel times, a multi-modal trip planning tool in northeastern Illinois helped newer residents establish efficient transportation habits. As knowledge of local transportation options increased, residents were more likely to use transit for some trips. Nearly 40 percent of all respondents and 50 percent of suburban respondents reported using at least one transit service that they did not usually use as a result of using the trip planning tool (2012-00794).

The Washington State DOT (WSDOT) placed data collection devices on heavily-congested areas of SR 512 and I-5 in the Olympic Region. The data collected from those devices were displayed in two places on WSDOT's website, on the state's 511 system and through the mobile phone application that WSDOT supports. 84 percent of survey respondents found traveler information provided by WSDOT useful, with 95 percent saying it should continue to collect and distribute travel congestion information (2013-00851).

> **84 percent of Washington survey respondents found freeway traveler information useful.**

SFPark, a smart parking systems (SPS) pilot program, works to provide San Francisco drivers with real-time information about available parking spaces. Sensors installed in the surface of each parking spot communicated with radio receptors about which spots were occupied. The information was then displayed to drivers via LED screens located outside of each lot and through the downloadable SFPark mobile app. Evaluation of the pilot indicated a 43 percent decrease in time spent looking for parking, as well as a 30 percent decrease in CO_2 emissions during the parking task (2015-00983).

First launched by the Iowa DOT in 2002, Iowa 511 provides real-time information on road traffic conditions, accidents, road closures, road construction, weather conditions, and other information of interest to the public. As of 2015, the Iowa 511 system disseminates information to the public via phone service, websites, social networks, and mobile applications (apps). A study carried out by the Center for Transportation Research at Iowa State University assessed the Iowa 511 Traveler Information System using survey results and usage data for the 511 phone, websites, and mobile apps maintained by the Iowa DOT. This survey indicated that 66 percent of drivers changed their route following information provided by Iowa 511 system (2015-01051).

Costs

Costs for Traveler Information systems vary widely based on the technologies used, as well as the quantity of each component used. The costs presented here are a sample of the system and unit costs available through the ITS Knowledge Resources Costs Database.

The Maine DOT updated its variable speed limit (VSL) system to include travel time information on Interstates I-95 and I-295 and surrounding arterials for $776,850. The VSL system was not part of an integrated system, but it used a tiered approach that involved radar, camera, and dispatcher information to verify incidents and reinforce traffic management decisions for the corridor (2014-00331).

Alaska developed NewGen 511 to replace a previous pooled fund 511 system they had been using. The public website uses a web-based interactive map interface that enables the user to zoom and pan to see symbolized alerts for construction, accidents, and weather advisories. The Alaska 511 system also has a mobile-version of the website with reduced features for use by mobile device and low bandwidth Internet users. It also utilizes RSS feeds to send alerts; a Facebook page; a Twitter account; an iPhone app; GovDelivery; and the traditional phone system. The system was designed to be multi-modal and includes information on Alaska's Marine Highways. The phone system has nearly doubled in call traffic since 2003. The system cost $440,000 to develop and $140,000 annually to operate ([2012-00263](#)).

Multi-modal trip planners can cost upwards of $4 million to develop for a metropolitan area. However, if systems are already in consolidated standardized databases and have feed access, there will be significantly reduced costs for development. In Oregon, TriMet used OpenTripPlanner and open source software to minimize costs and were able to develop their system for less than $150,000 ([2011-00228](#)).

Lessons Learned

Delivering traveler information to the public requires different solutions that depend on the types of alerts that need to be disseminated and the ways in which the public can access it. However, there are many lessons learned from other projects that can be generally applicable to the development and deployment of traveler information systems. Below is a sample of lessons learned:

- **Avoid unnecessarily restrictive requirements and ambiguous terms in bid documents**. Minnesota DOT (MnDOT) requirements for a traveler information procurement for the I-35 corridor focused more on performance outcomes rather than detailed design specifications. This gave the contractor more ability to innovate and optimize the system ([2014-00682](#)).

- **Monitoring traffic with vehicle probe data and coordinating traffic redirection in adjacent states can help motorists change routes prior to reaching congestion.** Vehicle probe data help manage traffic within a state, but also across state boundaries, accruing regional benefits along a multi-state corridor. North Carolina used probe data to identify building congestion on I-85 in Virginia and coordinated with Virginia to coordinate redirection onto less congested, parallel routes ([2010-00558](#)).

- **Design a trip planning website to capture and convey real-world factors such as gas prices and congestion information.** Market research reviewed during the project indicated that travel time information was important to travelers, but it was not the sole reason for mode choice. Researchers indicated that a well-designed trip planning website should be more than just an itinerary-trip planner; it should be able to effectively capture and convey real-world factors that make transit an increasingly attractive option. Researchers noted there was an increased desire for real-time vehicle location information, predictions, and disruption notification information, particularly when travelers were en-route and using mobile devices ([2012-00638](#)).

- **Develop a robust electronic interface for obtaining comprehensive incident information data from the highway patrol police organizations.** Obtaining information from local police can help to provide more complete incident information to the public. The Florida Highway Patrol CAD data served as a valuable source of information for the iFlorida's statewide traveler information service ([2010-00541](#)).

Case Study – I-64 Full Closure – St. Louis County, Missouri

The Missouri Department of Transportation (MoDOT) decided to use an accelerated construction plan to rebuild a 10 mile section of I-64 in St. Louis County. This construction plan required full closure of two large portions of I-64 for two years (2008-2009), rather than partial closures for six to eight years (as shown in Figure 1). In order to successfully meet the public's expectations for the project, MoDOT undertook an extensive traveler information campaign prior to the closure to make travelers aware of where the closure would be and suggested alternate routes (2012-00816).
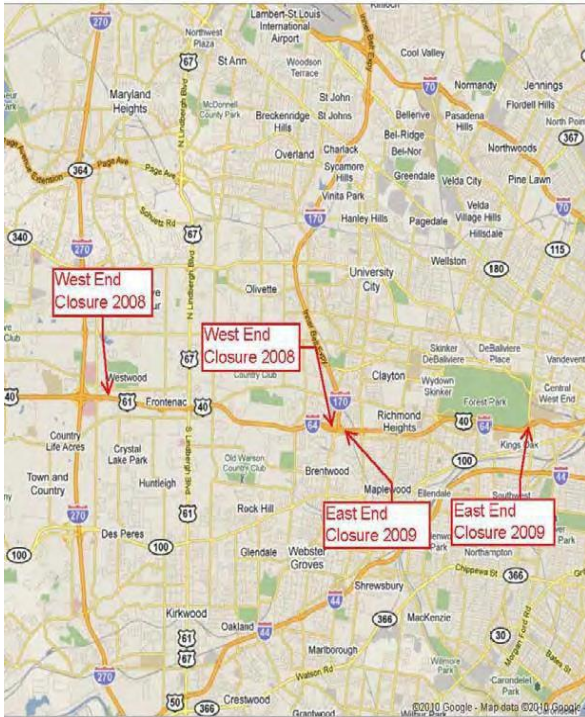

Figure 1: I-64 Full Closure General Information (Source: MoDOT, 2011).

MoDOT surveyed drivers in order to gauge the effectiveness of various forms of public communication used regarding the I-64 closure. MoDOT learned that television news was the best method to communicate project information, according to 78 percent of respondents. Road signs near the highway, radio news, and newspapers were also considered effective by more than half of the respondents. Only about 40 percent of the respondents felt that the internet was an effective way for MoDOT to communicate with them. Overall, 95 percent of residents surveyed were satisfied or very satisfied with how the I-64 closure was handled.

Prior to the closure of I-64, the alternative routes added capacity through restriping on the interstates and through upgraded signals and improved signal timing on arterial roads. While the alternative routes saw increases in volume, the efforts undertaken to increase capacity kept travel times along those routes similar to pre-closure levels. It is estimated that by diverting 98,000 to 120,000 vehicles daily to alternative routes for two years, the cost was $101.5 million more than the normal operational state. However, a partial closure for six to eight years would have cost between $147 million and $188.3 million. Assuming construction materials remained constant with inflation, the accelerated construction saved between $93 million and $187 million.

References

All other data referenced is available through the ITS Knowledge Resources Database, which can be found at http://www.itsknowledgeresources.its.dot.gov/ .