Phoenix's Roadway Closure and Restriction System

`12:13P`

`C-010 I-10 34TH ST`

Lessons Learned From The Metropolitan Model Deployment Initiative

Providing Enhanced Information To The Public

Table of Contents

Figures

Tables

1

*Phoenix's
Roadway
Closure
and
Restriction
System*

Preface

The Phoenix, Arizona Metropolitan Model Deployment was one of four cities included in the Metropolitan Model Deployment Initiative (MMDI). The initiative was set forth in 1996 to serve as model deployments of ITS infrastructure and integration. One of the goals of the MMDI is to disseminate information on the lessons learned from the deployments to assist other cities who may be considering using and/or integrating ITS.

The goals of Phoenix's Metropolitan Model Deployment effort — called "AZTech" — are to provide improved safety and regional mobility through enhanced traffic management and regional, multimodal traveler information. The Roadway Closure and Restriction System is a method by which improved regional traveler information can be gathered and disseminated. The intent of this report is to present a project description and lessons learned from the Roadway Closure and Restriction System (RCRS), one of the 15 projects deployed as part of AZTech.

Background

For the past several years, Arizona travelers were able to find out about closures and construction activities on major highways before they set out on a trip by using the Highway Closure and Restriction System (HCRS). The Roadway Closure and Restriction System is designed to expand on the Arizona Department of Transportation's initial system by providing information on local traffic systems. The result is a system that provides integrated information about the status of maintenance activities, road construction, special events, traffic speeds, and incidents on both major highways and local roads. The goal of this project is to share information with travelers so they may plan ahead to determine which route will provide the most efficient travel path.

2

*Phoenix's
Roadway
Closure
and
Restriction
System*

From Highways to Local Roads

The initial Highway Closure and Restriction System was designed to permit statewide collection and dissemination of information on Arizona Department of Transportation freeways only. In order to include local traffic system information, the Arizona Department of Transportation had to reach out to AZTech municipal partners.

The integration of the two systems (local and regional) provided a challenge for the AZTech partners. The Highway Closure and Restriction System is based on main-frame computer technology, while the new Roadway Closure and Restriction System operates on a Windows NT platform. Also, the two systems use different data structures. The Highway Closure and Restriction System uses road numbers, mile posts, and freeway exits to record locational data, while the Roadway Closure and Restriction System uses street and intersection references. Sophisticated data fusion was required to provide information from both systems. Arizona has offered to license the system software to any other state transportation agency at no charge, including full source code.

The integration is being achieved by providing agencies with AZTech computer workstations that allow them to manually enter information about travel conditions within their respective boundaries. The information includes incidents, road closures, lane restrictions, road maintenance, road conditions, and weather problems. The integrated information is disseminated to the public via the AZTech Trailmaster web site, kiosks, and a toll-free, dial-in phone number. The updated system will provide travelers with expanded, real-time traffic information to assist with route planning.

"By showing both actual and planned closures, the RCRS [Roadway Closure and Restriction System] will help neighboring cities coordinate their closures."

Pierre Pretorius –
AZTech Program Manager

Phoenix's
Roadway
Closure
and
Restriction
System

Institutional Issues Concerning Integration

This project required a high level of communication and coordination among the different districts within the Arizona Department of Transportation and with several local partners.

The Roadway Closure and Restriction System is linked to other systems through the AZTech server. Each jurisdiction that is linked to the server can update its roadway and highway closure information. Once information is manually input into the system, the server relays it to the web site, kiosks, and the toll-free telephone system. Other freeway information, such as incidents and lane closures, is relayed in parallel with the closure and restriction information.

The local municipalities in Phoenix were able to share infrastructure, which led to equipment cost-sharing. To reach the shared information phase of integration, several jurisdictions in Phoenix were forced to disband institutional barriers and increase inter-jurisdictional communication. Thus, the outcome involves a more regional approach to traveler information reporting.

4

Phoenix's
Roadway
Closure
and
Restriction
System

Features of the Road Closure and Restriction System

The web-based feature of the system uses a graphical map with icons showing current restrictions or closures. The first map shows a section of the western United States, and travelers can access information for Arizona, Nevada, Utah, New Mexico, or a section of southern California. From this level, the user selects a state to receive more detailed information on level of service, incidents, lane restrictions, road closures, weather conditions, and temperatures.

Once the state has been selected, the user can see the icons on the map and determine what type of closure exists from the icon key. The user can select a specific area to get a more detailed description. Oftentimes an area has several icons and will seem cluttered, but the user is able to obtain a more detailed view by clicking on an icon. This situation is shown on the map below (Figure 1) around the Phoenix area where many incidents occur over a small area of display.

Figure 1. Highway Closure and Restriction System Map with Icons

5

*Phoenix's
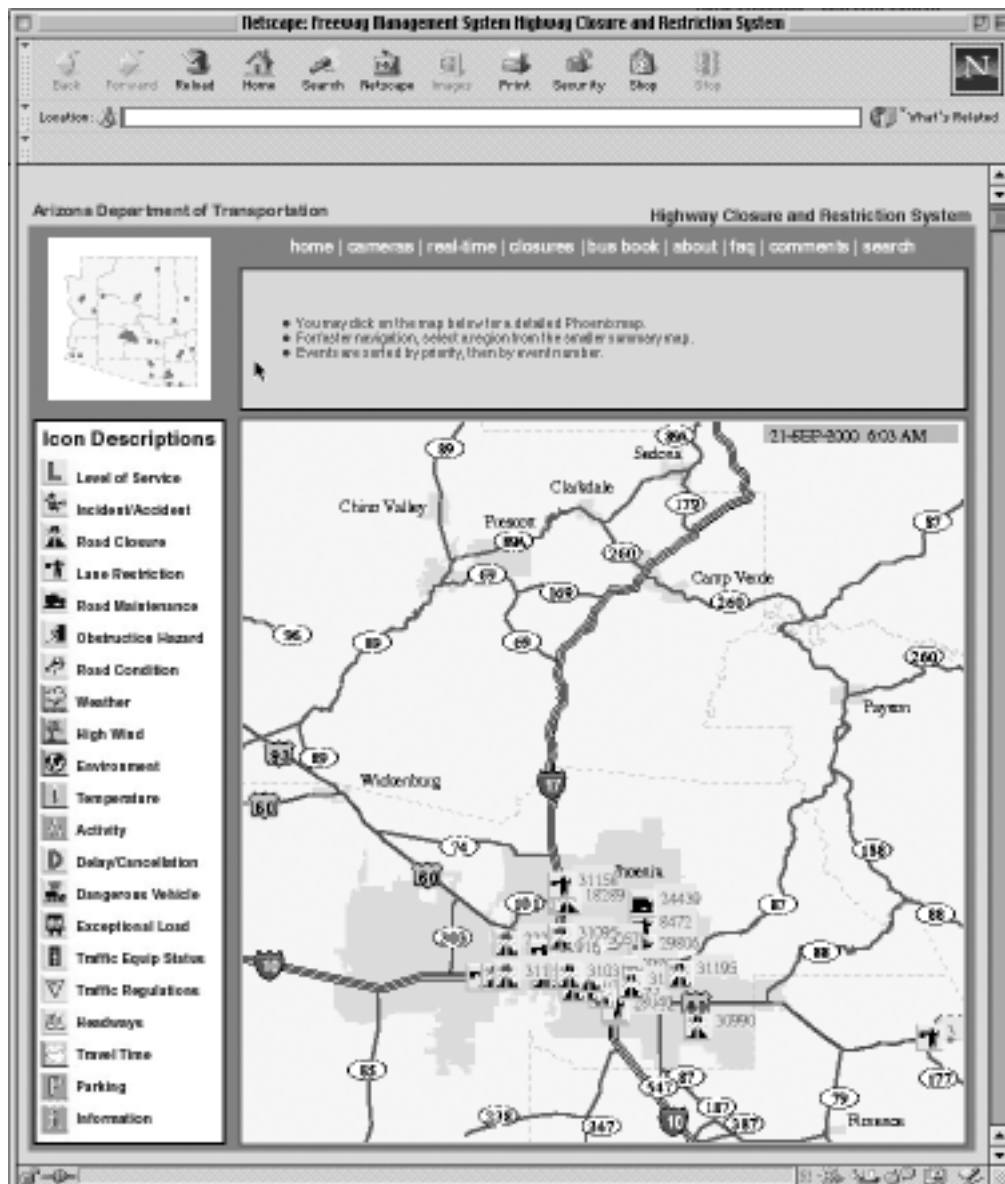Roadway
Closure
and
Restriction
System*

Figure 2 shows a local view of closures and restrictions for Phoenix. Below the map will be a listing of the specific closure or restriction by number, along with the duration of the event and a description. Icons also can be seen in this window; they show a description of the information provided.

The toll-free dial-up component of the system (888-411-ROAD) uses Voice Remote Access technology to share real-time, roadway information with users. After entering a highway number or the first three letters of a city name, a computerized voice relays closure and restriction information to the user. The information is updated every five minutes.

Figure 2. Highway Closure and Restriction System Map Displaying Closures and Restrictions

6

*Phoenix's
Roadway
Closure
and
Restriction
System*
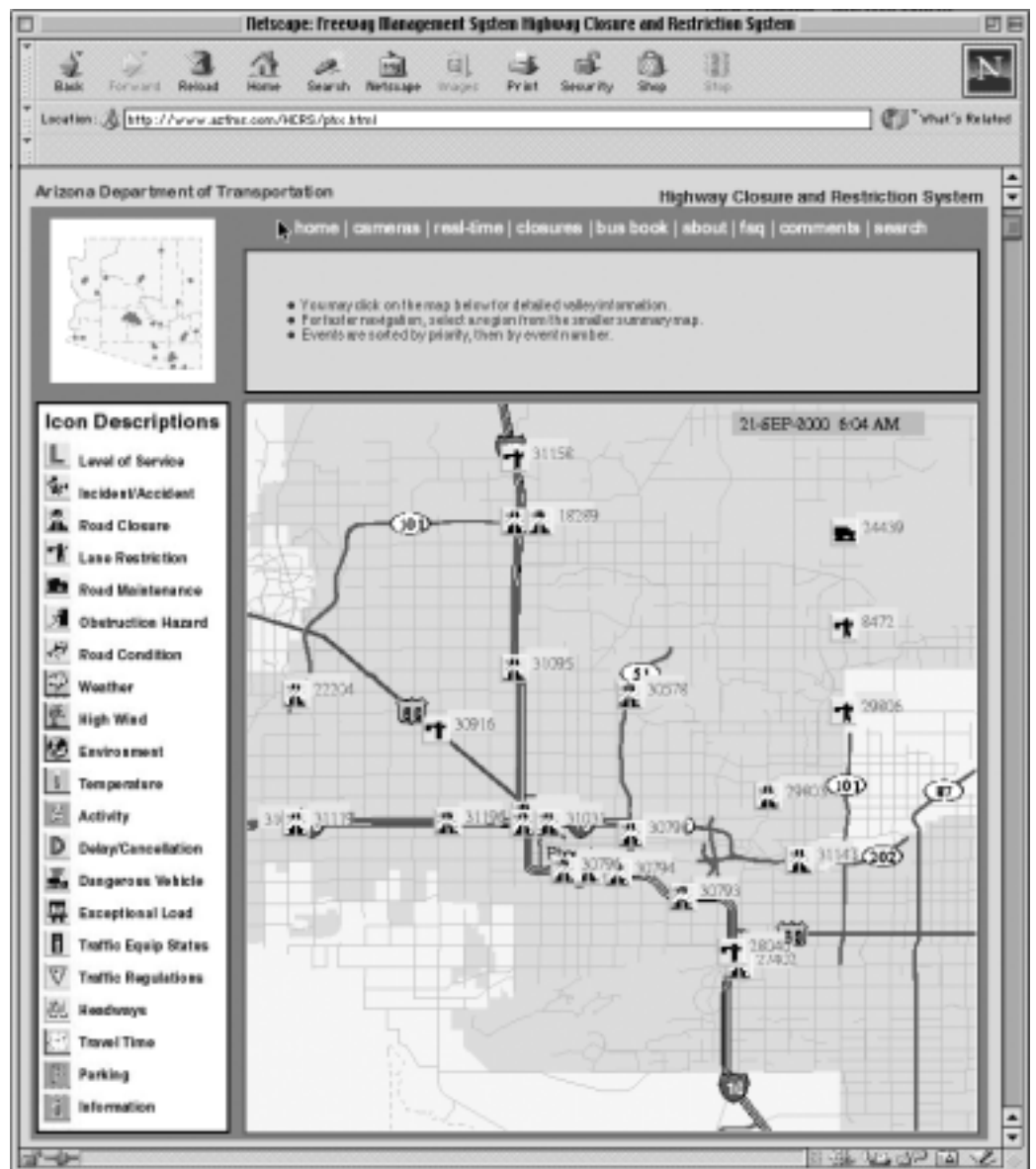
Deployment Costs

The main costs for the system upgrade include a Pentium Workstation, and Services, Training, Support, and Development Labor (see Table 1). Because the new system is an upgrade of an existing system, the development costs are lower than what would be seen for a newly deployed system. The other costs are shared among the other 15 model deployment projects, eight planned additional Traffic Operations Centers, and two Fire Dispatch Centers. These server costs are shared because it is the core component that integrates all of the transportation information systems.

Roadway Closure and Restriction System is a Success

Several focus groups were formed to analyze the positive and negative aspects of the closure and restriction information services. Overall, users were pleased with the usefulness of the information contained within Trailmaster. In fact, the Roadway Closure and Restriction System was the sixth most viewed web site for regional coverage, and the eighth most viewed web site for statewide coverage.

Table 1. Systems Upgrade Costs

Equipment Description	Deployment Costs ($)	Annual Costs ($)
Pentium Workstation, Monitor, Modem	67,500	
Standard Software & Development Tools	22,500	
Services, Training, Support & Development Labor	196,647	
Workstation Labor		35,425
ISP Costs		2,952
4% Share of AZTech Hardware & Software	2,734	
4% Share of Wide Area Network/Codec	14,594	
4% Share of Video Switch Expansion	810	
4% Share of TRW Systems Engineering & Project Management	46,666	
4% Share of Traffic Operations Center Operator Training	2,891	
4% Share of AZTech Server Equipment Replacement		4,281
4% Share of AZTech Server Operations & Maintenance Staff		4,100
Total	$354,342	$46,758

Summary

The upgrades to the Highway Closure and Restriction System provide traveler information for arterials and local roads, at a lower cost than implementing a completely new system. The new Roadway Closure and Restriction System integrates urban and rural data, and allows input from jurisdictions on current and planned events. The system then relays the information to the public for use in route planning and estimating travel time. The success of the Roadway Closure and Restriction System can be attributed to the careful planning and coordination among jurisdictions.

Lessons Learned

The Phoenix area benefited from an upgrade to the Highway Closure and Restriction System, without the cost of implementing a completely new system. If a system is already in place, agencies should consider the cost implications of updating it instead of creating an entirely new system from scratch. An analysis showed that web usage statistics are a good indicator of success of the system, while the user-friendly environment allows for expanded use by transportation professionals.

"Everybody is now reporting their planned closures and maintenance activities in the same format, on the same system. This allows us to share information and collect it at one location to be distributed to the public."

Dan Powell –
AZTech Chief Administrator

8

Phoenix's
Roadway
Closure
and
Restriction
System

ITS Web Resources

ITS Joint Program Office:
www.its.dot.gov

ITS Cooperative Deployment Network:
www.nawgits.com/icdn.html

ITS Electronic Document Library (EDL):
www.its.dot.gov/itsweb/welcome.htm

ITS Professional Capacity Building Program:
www.pcb.its.dot.gov

Federal Transit Administration
Transit ITS Program:
www.fta.dot.gov/research/fleet/its/its.htm

Intelligent
Transportation
Systems

U.S. Department of Transportation
400 7th Street, SW
Washington, DC 20590