

MAG ITS Strategic Plan Update

Technical Memorandum #2

- Intelligent Transportation Solutions: An Overview of Intelligent Transportation Systems in the MAG Region (presentation)

Prepared by:



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TABLE OF CONTENTS

Technical Memorandum #2

1. INTRODUCTION.....1

2. FORMAT AND KEY SECTIONS1

 2.1 PRESENTATION FORMAT1

 2.2 KEY SECTIONS.....1

3. PRESENTATION HIGHLIGHTS2

4. REFERENCES AND SOURCES2

APPENDIX.....4

1. INTRODUCTION

A multimedia presentation was developed which will serve as an excellent tool to educate project stakeholders and others in the region with an interest in ITS and transportation issues. The *“Intelligent Transportation Solutions: An Overview of Intelligent Transportation Systems in the MAG Region”* presentation combines narrated video clips with PowerPoint slides. It can be narrated by a presenter, or run as a stand-alone slide-show file as there is sufficient text on the presentation slides to give the viewer a clear understanding of the key points.

2. FORMAT AND KEY SECTIONS

2.1 Presentation Format

The presentation was developed with the intention of being viewed by both technical and non-technical audiences. The various technologies and local ITS applications are described in layman’s terms, and are illustrated with photographs and narrated video clips. Local and national benefits and statistics also are presented to give the audience additional information on the importance of ITS and its potential to solve regional transportation and mobility issues.

The PowerPoint slide-show format allows for sound and video clips, as well as photos to illustrate various ITS technologies and programs. PowerPoint was used so that the presentation could be run from any PC, or displayed through a projector or on a monitor. Effects and “builds” were used on some slides to provide for some animated features for photos and bulleted text items. The content and format provide enough flexibility to allow for the presentation to be facilitated by a narrator or run as a stand-alone slide-show. A “manual” PowerPoint file as well as a slide-show file (which can be viewed with Microsoft PowerPoint Viewer 97 for machines that don’t have PowerPoint) was prepared. A copy of the slides with an accompanying script is included as an **Appendix** to this technical memorandum.

One hundred CDs containing the PowerPoint file, slide-show file, associated .avi video clips, and Microsoft PowerPoint Viewer were produced.

2.2 Key Sections

The Overview presentation is comprised of the following key sections:

- An introduction to local, regional and national transportation issues that affect lives, travel time, and impact the economy;
- A definition of ITS – what they are and how they work;
- An overview of local ITS programs in the MAG region and associated benefits, including:
 - Freeway Management System
 - City Traffic Signal Control Systems
 - Regional Transit Management System
 - Commercial Vehicle Operations
 - Incident and Emergency Management Systems
 - Pedestrian and Bicycle Systems
 - Traveler Information;
- MAG’s role in and vision for ITS in the region; and
- The purpose of the MAG ITS Strategic Plan Update, including contact information to allow stakeholders to obtain more information and provide input.

3. PRESENTATION HIGHLIGHTS

The team approached the presentation with two objectives: to develop a presentation that will educate and inform, and showcase ITS deployments and programs in the MAG region and Arizona. By highlighting local ITS achievements, viewers will gain an understanding of how ITS is already at work in their community. Furthermore, it is expected that this presentation will be viewed by non-residents, so it was important to emphasize the amount of ITS that has been deployed in the MAG region.

Key projects that were emphasized in the MAG ITS Overview presentation include:

- The 1995 and Update to the MAG ITS Strategic Plan;
- The Arizona Department of Transportation's Freeway Management System;
- AZTech™;
- Transit, traffic signal, and emergency management programs in the MAG region; and
- Local traveler information programs, including municipal traffic reporting television channels, the ADOT web page, and field hardware (variable message signs, kiosks, etc.).

4. REFERENCES AND SOURCES

To streamline the presentation development process and be consistent with federal ITS educational materials, the project team made maximum use of existing U.S. Department of Transportation and Federal Highway Administration media, both print and video. The following is a list of references for the sources used in MAG's ITS Overview presentation:

Arizona Department of Transportation. Transportation Planning Group. *1998 Transportation Factbook*. Mar. 1998.

AZTech Project Archive and Project Report. Phoenix, Arizona. Apr. 1999. (CD ROM)

Insurance Institute for Highway Safety Website, <http://www.hwysafety.org>.

U.S. Department of Transportation. Federal Highway Administration, ITS Joint Program Office. *Intelligent Transportation Systems: Real World Benefits*. Publication No. FHWA-JPO-98-018, Jan. 1998.

U.S. Department of Transportation. Federal Highway Administration, ITS Joint Program Office. *Metropolitan ITS*. Publication No. FHWA-JPO-98-023.

U.S. Department of Transportation. Federal Highway Administration, ITS Joint Program Office. *Intelligent Transportation Systems*. Publication No. FHWA-JPO-98-008.

U.S. Department of Transportation. Federal Highway Administration. Office of Operations Technology Services. *Federal Transit Administration. Intelligent Transportation Systems Awareness*, ver. 2.0. Publication No. FHWA-SA-99-016. (CD ROM)

Photographs and other images were obtained from the following:

- Maricopa Association of Governments
- Federal Highway Administration – ITS Awareness CD ROM version 2.0
- AZTech™ Model Deployment Initiative: Project Archive and Project Report CD-Rom
- Arizona Department of Transportation Trailmaster
- Erin O’Boyle
- Kimley-Horn and Associates, Inc.
- City of Phoenix
- Valley Metro
- Fox 10 News

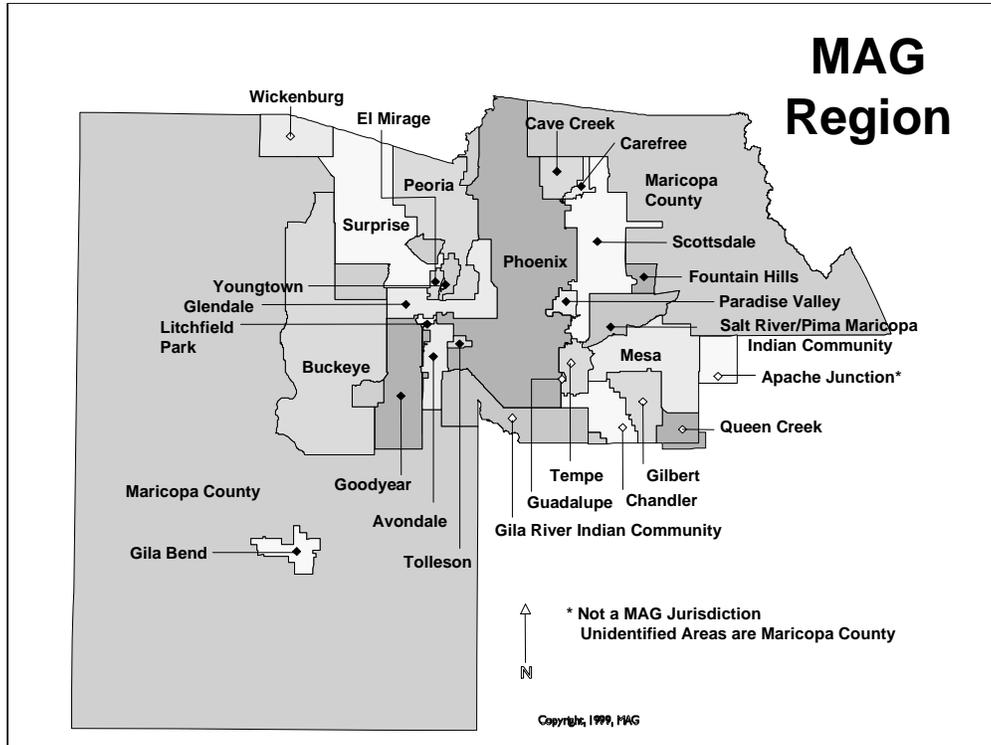
APPENDIX

Intelligent Transportation Solutions

An Overview of Intelligent Transportation Systems in the MAG Region



This presentation is intended to provide an overview of some of the region's most pressing transportation issues, what local agencies are doing to help solve those problems, and how intelligent transportation systems have become an integral part of the transportation network in the region.



The Maricopa Association of Governments (MAG) is a Council of Governments that serves as the regional agency for the metropolitan Phoenix area. MAG provides a regional forum for analysis, discussion and resolution of issues including areas of transportation, air quality, environment, regional development and social services.

The MAG membership currently consists of the 24 incorporated cities and towns within Maricopa County, the Gila River Indian Community, the Salt River Pima Maricopa Indian Community, Maricopa County, the Arizona Department of Transportation (ADOT) and the Citizens Transportation Oversight Committee (CTOC). ADOT serves as an ex-officio member for transportation-related issues.

Transportation Problems

Lives...

- ▶ Approximately 40,000 people die each year in traffic related accidents nationwide
- ▶ Nearly 1,000 people a year lose their lives in traffic related accidents in Arizona
- ▶ In Maricopa County, severe traffic congestion limits the ability of police, fire, and ambulance to quickly reach victims in emergencies

Statistics Sources:

The Insurance Institute for Highway Safety

Continued growth and urban sprawl places tremendous demands on our local roadways. The cost of traveling is often paid with lives, time, as well as money.

Safety is a prime concern, and there are thousands of people each year who die in traffic-related accidents.

Transportation Problems

Time...

- ▶ Americans spend 2 billion hours in traffic every year
- ▶ In the next decade, the number of automobiles on Arizona's freeways and roads will increase by as much as 50 percent, adding to the existing congestion
- ▶ Valley residents travel over 60 million miles and take over 10 million trips each day

Statistics Sources:

Intelligent Transportation Systems Pub. No. FHWA-JPO-98-023, USDOT ITS Joint Program Office

1998 Arizona Transportation Factbook, Arizona Department of Transportation

Congestion on freeways and surface streets is growing at an alarming rate - millions of cars on local roadways each day results in traffic delays and driver stress.

Transportation Problems

Money...

- ▶ Nationwide, the cost of congestion is \$50 billion in lost productivity and the cost of traffic accidents is more than \$150 billion
- ▶ Arizona residents spend an average of \$1,000 per vehicle in fuel costs each year
- ▶ Transportation funds in Maricopa County are contingent on good air quality, which can be helped by reducing congestion

Statistics Sources:

*1998 Arizona Transportation Factbook, Arizona Department of Transportation
Intelligent Transportation Systems Pub. No. FHWA-JPO-98-023, USDOT ITS Joint
Program Office*

The economic impact of transportation goes beyond fuel prices - accidents and lost productivity cost our nation close to \$200 billion each year.

Transportation Solutions

- ▶ Solving the valley's transportation problems will require a combination of different strategies
- ▶ Intelligent Transportation Systems are a key strategy used by MAG to solve transportation problems

Adding new lanes to already congested roadways isn't a complete solution. Today, agencies need a combination of strategies to make sure that the transportation system meets the region's current needs, as well as future demands.

What are Intelligent Transportation Systems (ITS)?



The application of advanced technologies and new processes to improve the efficiency, mobility, and safety of the transportation system

Intelligent Transportation Systems, or ITS, provides a cost-effective way of making our streets work smarter, not harder.

(In normal PowerPoint mode, double click the black box and the narrated video clip will run. In Slide Show mode, click to advance the slide and the narrated video clip will run.)

Local ITS Applications in the MAG Region

- ▶ Freeway Management System
- ▶ City Traffic Signal Control Systems
- ▶ Regional Transit Management System
- ▶ Commercial Vehicle Operations
- ▶ Incident and Emergency Management Systems
- ▶ Pedestrian and Bicycle Systems
- ▶ Traveler Information

The Maricopa Association of Governments, Arizona Department of Transportation, Federal Highway Administration, and MAG partner agencies recognize the importance of ITS to solve regional transportation problems. From coordinated signal systems and real-time traffic reports, to bus locating systems and a regional freeway management system, agencies are working together to make traveling safer, faster, and less stressful on the area's motorists.

The next several slides provide an overview of some of the ITS elements that are at work in the MAG region to help regional mobility and safety on our roads.

Local ITS Applications

Freeway Management System



ADOT Traffic Operations Center

The Freeway
Management System
improves the safety
and efficiency of the
freeway system



(In normal PowerPoint mode, double click the black box and the narrated video clip will run. In Slide Show mode, click to advance the slide and the narrated video clip will run.)

Local ITS Applications Freeway Management System

Benefits:

- ▶ Ramp metering improves freeway traffic flow by 8-22% and speeds by 13-48%
- ▶ Closed-circuit TV cameras help with quick identification and dispatch of help to crashes and breakdowns
- ▶ Variable message signs help direct traffic to the best route during closures and special events



Statistics Source:

Intelligent Transportation Systems Pub. No. FHWA-JPO-98-008, USDOT ITS Joint Program Office

ADOT's Freeway Management System in Phoenix has instrumented many of the urban freeway miles with variable message signs, ramp meters, closed-circuit television cameras, and a communications network. All of the field equipment is centrally controlled and monitored from ADOT's Traffic Operations Center. It is one of the most sophisticated systems of its kind in the country.

Local ITS Applications

City Traffic Signal Control Systems



City of Phoenix Traffic
Management Center

City Traffic Signal
Control Systems help
decrease congestion,
travel time, and
emissions



(In normal PowerPoint mode, double click the black box and the narrated video clip will run. In Slide Show mode, click to advance the slide and the narrated video clip will run.)

Local ITS Applications

City Traffic Signal Control Systems

Benefits:

- ▶ City traffic management centers enable operators to monitor large areas during rush hours
- ▶ During incidents and special events, signal timing can be quickly adjusted to reduce congestion



Statistics Source:

Intelligent Transportation Systems Pub. No. FHWA-JPO-98-023, USDOT ITS Joint Program Office

Several cities in the MAG region have upgraded their computerized traffic signal systems. These modern systems can be timed to be responsive to traffic needs, whether it is rush hour delays or traffic is backed up because of an accident. In addition, several cities have upgraded their traffic control centers which serve as the hubs for monitoring their signal systems.

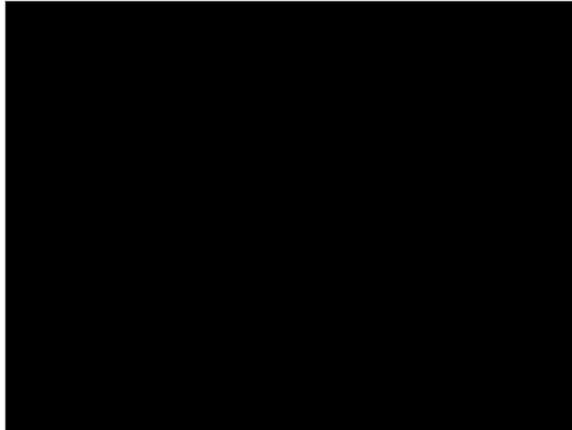
Local ITS Applications

Regional Transit Management System



Phoenix Transit Dispatch Center

The Regional Transit Management System includes improved transit dispatch, smarter buses that can accept credit cards, improved safety, reliability and convenience



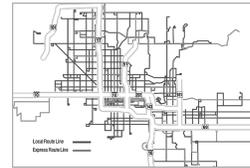
(In normal PowerPoint mode, double click the black box and the narrated video clip will run. In Slide Show mode, click to advance the slide and the narrated video clip will run.)

Local ITS Applications

Regional Transit Management System

Benefits:

- ▶ Automatic vehicle location and computer dispatch improves on-time performance as much as 23%
- ▶ Smart cards for fare payment reduce passenger boarding time and add to convenience of transit
- ▶ Silent alarms and video enforcement improve transit safety



Statistics Sources:

Intelligent Transportation Systems: Real World Benefits, Pub. No. FHWA-JPO-98-018, FHWA ITS Joint Program Office

Transit agencies in the MAG region have implemented automatic vehicle locating equipment so that dispatch centers know exactly where the buses are on their routes. Phoenix also was among the first to implement a convenient magnetic swipe card payment system on its buses so patrons wouldn't need exact change.

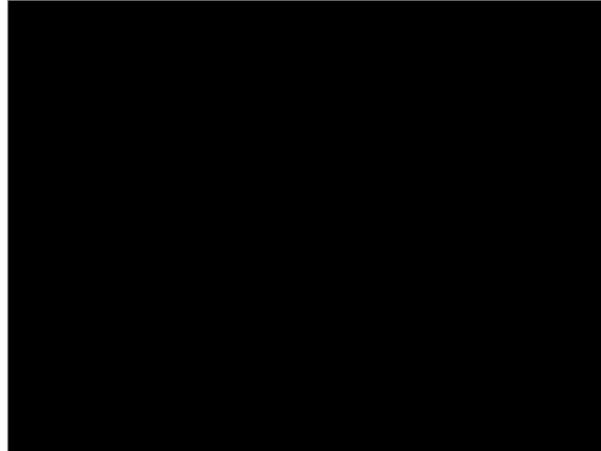
Local ITS Applications

Commercial Vehicle Operations



Weigh-In-Motion on
Interstate 10 at the Broadway
Curve

Commercial Vehicle
Safety Systems
ensure safer trucks,
which mean safer
highways for all
travelers



(In normal PowerPoint mode, double click the black box and the narrated video clip will run. In Slide Show mode, click to advance the slide and the narrated video clip will run.)

Local ITS Applications

Commercial Vehicle Operations

Benefits:

- ▶ On-board safety systems, along with electronic clearance and automated roadside safety inspections, are estimated to reduce fatalities by 14-32%
- ▶ Weigh-in-motion devices allow officials to check for overweight loads without stopping trucks



Statistics Sources:

Intelligent Transportation Systems Pub. No. FHWA-JPO-98-008, USDOT ITS Joint Program Office

In the MAG region weigh-in-motion scales are installed on local freeways to monitor truck traffic, and Phoenix based trucking companies use sophisticated operations centers to monitor the movement of their truck fleets around the country.

The Kingman Port of Entry in Arizona is equipped with weigh-in-motion scales, variable message signs, and closed-circuit television cameras. These technologies help streamline the process for truckers coming into Arizona from California and Nevada.

Local ITS Applications

Incident and Emergency Management Systems



Phoenix Fire Dispatch Center

Incident and Emergency Management Systems ensure fast and efficient emergency services and dispatch, and reduce road closure and accident investigation time



Incident and emergency management encompass almost every aspect of an intelligent transportation system. From detecting and verifying an incident, to dispatching emergency crews, and helping to manage the incident once on-scene, ITS can set in motion a coordinated response to incidents.

Local ITS Applications

Incident and Emergency Management Systems

Benefits:

- ▶ Incident management systems decrease travel time by 10-45% during incidents
- ▶ Safety is improved and crashes are reduced by warning drivers of closures, accidents, and severe weather conditions
- ▶ Provide faster incident detection and emergency vehicle dispatch



Statistics Sources:

Intelligent Transportation Systems: Real World Benefits, Pub. No. FHWA-JPO-98-018, FHWA ITS Joint Program Office

ITS not only gives emergency crews additional tools to quickly get to the scene, but it helps warn other drivers of an upcoming incident and route them to other streets to avoid incident-caused congestion.

Local ITS Applications

Pedestrian and Bicycle Systems

- ▶ Audible pedestrian crossing signals increase safety for blind pedestrians
- ▶ Bicycle detectors at intersections adjust signal timing to accommodate bicycle needs
- ▶ Safer facilities for pedestrians and bicycles encourage these alternate modes of transportation and assist in reducing vehicular congestion



ITS isn't limited to motorized transportation. Technologies such as audible crosswalk signals and special detectors in bicycle lanes to adjust signal timing are making streets and crosswalks safer for pedestrians and bicyclists.

Local ITS Applications Traveler Information



Television and radio traffic broadcasts use closed-circuit TV cameras and traffic detector information to accurately report local traffic conditions

Knowing about traffic conditions, before you get stuck in gridlock, can help save you time and stress. Radio broadcasts and variable message signs can provide up-to-date information while en-route.

Even if you haven't left home, information about traffic conditions is available from television traffic reports, on the Internet, or through customized cell phone and pager subscriptions. Many local television stations now use ITS components, such as the ADOT freeway CCTV camera used in the video clip, to increase the accuracy of their traffic reports.

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Local ITS Applications Traveler Information



Cable television broadcasts are tailored to provide traveler information for residents of individual cities

Municipalities in the MAG region are dedicating cable TV channels to broadcast continuous traffic information. Tempe's Channel 11 is shown here.

(In normal PowerPoint mode, double click the black box and the narrated video clip will run. In Slide Show mode, click to advance the slide and the narrated video clip will run.)

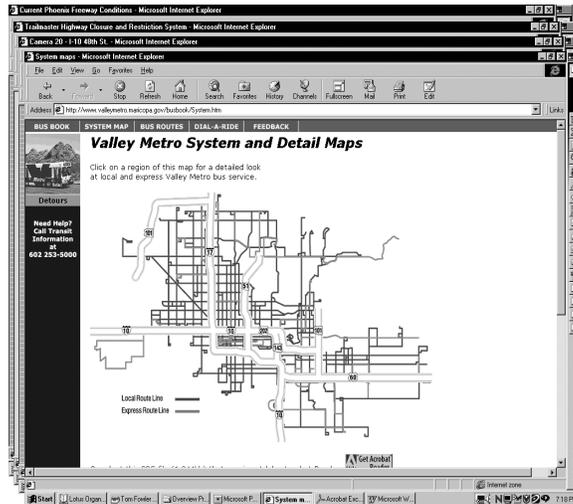
Local ITS Applications Traveler Information

Internet sites provide direct access to:

- ▶ Travel Speeds
- ▶ Incidents
- ▶ Cameras
- ▶ Transit Schedules

URLs:

- ▶ <http://www.azfms.com>
- ▶ <http://www.valleymetro.maricopa.gov>
- ▶ <http://www.etaktraffic.com/phoenix>



Internet sites allow users to select the specific type of travel information they need as well as the specific location.

Local ITS Applications Traveler Information

Other local traveler information applications include:

- ▶ Variable Message Signs
- ▶ Kiosks
- ▶ Cellular Phone Notification
- ▶ Paging and e-mail systems
- ▶ Palm top computers
- ▶ Auto PC



Drivers in the MAG region can access information about road closures, accidents, detours, and other incidents that can help them make better route choices. The AZTech program has integrated and enhanced traveler information in the region by providing a centralized clearinghouse for up-to-the-minute, multimodal information.

AZTech has brought together public agencies and the technology industry to enhance the quality and availability of real-time information for motorists.

The Maricopa Association of Governments (MAG) Role in ITS

MAG Vision for ITS:

Enhance the quality of life in the MAG Region by applying technology and information sharing to improve the multimodal transportation system



MAG has taken a leadership role to integrate ITS into the region's long-range transportation planning focus.

The MAG ITS Strategic Plan

This overview of Intelligent Transportation Systems has been developed as part of the 1999 update of the region's ITS Strategic Plan. The plan will:

- ▶ Ensure an integrated ITS system
- ▶ Make extensive use of stakeholder input
- ▶ Identify transportation problems and needs
- ▶ Develop ITS projects that address those problems and needs



The MAG ITS Strategic Plan Update is going to provide a roadmap for transportation projects in the region for the next 20 years. With the amount of ITS infrastructure that is already in place and planned, the focus of the Update will be on identifying new needs and priorities, identifying opportunities to mainstream ITS with other regional transportation projects, and developing long-term strategies to fund, operate and maintain the systems.

Questions, Comments and More Information

Website: <http://www.mag.maricopa.gov/ITS/index.html>

E-mail Address: mag-its@mag.maricopa.gov

Hotline: 1-877-471-PLAN



To learn more about ITS and the MAG ITS Strategic Plan Update, a website, E-mail address, and project hotline are available.

Photograph and Video Credits

Maricopa Association of Governments

Federal Highway Administration: ITS Awareness CD-ROM Version 2.0

AZTech™ Model Deployment Initiative: Project Archive and Project
Report CD-ROM

Arizona Department of Transportation Trailmaster

Kimley-Horn and Associates, Inc.

Erin O'Boyle

City of Phoenix

Valley Metro

Fox 10 News

Photographs and other images in this presentation were obtained from the following sources.