The AZTech partnership is a seamlessly integrated, multimodal regional freeway and arterial street traffic-management system developed for the Phoenix metropolitan area and is making significant and remarkable advances in decreased travel time, enhanced motorist safety, traffic mobility and roadway efficiency.

Jointly headed up by the Arizona Department of Transportation (ADOT) and the Maricopa County Department of Transportation (MCDOT), AZTech began as one of four Model Deployment Initiative (MDI) sites for intelligent transportation systems (ITS) in the country focusing exclusively on shared traffic management and operation communications and technology.

The multijurisdictional 26-member AZTech partnership includes ADOT, MCDOT, most of Maricopa County’s urban cities and towns, the Federal Highway Administration (FHWA), local metropolitan planning and public transportation agencies, research teams from Arizona State University and the University of Arizona, local media and private ITS industry partners.

Stopping separation

The AZTech concept originally emerged as a solution to mounting concern among local civic leaders that separate transportation agendas serve neither the regional traveler nor individual agency traffic managers. Since its launch, made possible by a $7.5 million U.S. DOT grant, AZTech has become a highly effective mechanism for traffic-management interfacing and integration.

Early on and following MDI implementation, substantial effort was steered toward pilot infrastructure deployment, establishment of regional collaboration and public-private traveler-information partnerships. AZTech then set about establishing a Regional Archive Data System (RADS) to serve as the engine for regional data storage and processing of estimating freeway travel times that are disseminated real-time to the media and public through websites and roadway dynamic message signs (DMS).

During this same period, AZTech also initiated standards for data exchange between linked jurisdictional traffic-management centers (TMCs). In 2006, RADS took a major step forward with the integration of public safety computer-aided dispatch data to enhance the dissemination of incident traffic information to the public. In 2009,
with a solid infrastructure base established, AZTech met the next challenge and successfully shifted from model deployment to model traffic operations. It has researched, developed, tested and assimilated the latest in innovative transportation technology and demonstrated the distinct and measurable advantages of a multiagency regional traffic-management-operating coalition.

The AZTech organizational structure consists of an executive committee (AEC), a strategy task force (ASTF) and four subcommittees. The AEC meets biannually and guides the vision of the organization, champions resources and addresses political and institutional barriers.

The AZTech operations action plan was developed in 2009. The ASTF is charged with the task of developing strategies for plan implementation and identifying future regional projects. Four subcommittees include the Advanced Traveler Information Systems (ATIS) Working Group, the Operations Committee (AOC), the Traffic Management Center (TMC) Operators Working Group and the Traffic Incident Management (TIM) Coalition, each group focusing respectively on traveler information, regional operational guidelines and technology, traffic management and incident management.

The action plan also led to an FHWA-supported Capability Maturity Model (CMM) Workshop and the Arizona Operations Academy (Phoenix metropolitan area) and Executive Summit in early 2010 to foster understanding and support for traffic management and operations among traffic-management, maintenance and planning managers. The action plan also served to extend AZTech concepts to high-level decision makers and elected officials. The CMM Workshop helped to assess the level of maturity of regional traffic operations and identify areas needing specific attention to further gain enhanced overall operations.

**Breaking down the action**

The priorities of the action plan are as follows:

**Alternate route policies:** ADOT developed an alternate route plan in 2012 and the TIM Coalition, led by the Department of Public Safety, introduced improved practices to reduce freeway clearance times with direct associated benefits of limiting time that first responders are exposed to traffic and reduced risk of secondary crashes.

AZTech began as one of four MDI sites for ITS in the country focusing on shared traffic management and operation communications and technology.

**Job descriptions and training:** The improvement of traffic management and operations through the implementation of ITS strategies requires resources with new skill sets focused on technology and system integration. These evolving resource needs do not typically fit into the established transportation job descriptions, and attracting and retaining adequate resources have become an ongoing challenge for most local agencies. The AOC prepared a document identifying future skill sets and potential certification for ITS professionals. The intent is to work through national transportation and ITS committees to enhance awareness of the needs and plan and traffic-signal phasing plans for accommodating diverted freeway traffic onto the local street network in the event of a serious freeway incident. TIM stakeholders include ADOT, MCDOT, city of Scottsdale traffic-engineering and police departments, state and county incident-response teams, and the local Indian community.

Lessons learned from this ICM plan will serve as guidance in expansion of ICM to other freeway corridors in the region. The plan also is intended to form a basis for including enhanced technology to assist with the decision-making process during event traffic management.

**Performance indicators:** Many local agencies were already closely monitoring, evaluating and enhancing their individual transportation systems. AZTech identified a need for a collective regional performance report resulting in the first AZTech “Traffic Management and Operations Key Indicators Book” published in 2011. This book identified policy goals/performance measures for freeways, arterials, safety, incident management for freeways and arterials, traveler information and transit. These measures serve as an initial baseline, and as traffic management continues to implement incremental improvements, the next publication will refine those measures to ensure the greatest benefit to the public.

Other activities include improved cross-discipline communications, best practices review through incident debriefings and joint training and planning. An integrated corridor management (ICM) study is currently under way on a 16-mile segment of freeway in the northeast Phoenix metropolitan area to define a traffic-incident-management plan (TIMP) that will include guidelines for regional and local coordination, emergency-response plan, en-route traveler-information
build consensus on future job descriptions and possible certification.

**Improved travel-time information on freeways and arterials:** ADOT has recently implemented major expansions to the regional freeway-management system, which now includes freeway-traffic detection for 253 miles of roadway, 208 CCTV cameras, 200 ramp meters and 173 DMS. Travel times are posted for morning and afternoon peak hours on 32 freeway DMS, which cover 400 destination miles. This expanded system of detection and travel-time provision is supported by further enhancements to RADS for calculating and updating the travel times on a real-time basis. A further enhancement of the system also is under way to provide travel times on DMS for certain high-volume arterials.

To support the expanded freeway- and arterial-management systems and extended services to the public, both ADOT and MCDOT have recently completed major upgrades and expansions to their traffic-operations centers, and the city of Chandler partner also posts arterial and freeway travel times on arterial DMS.

**Polishing the Bell**
In addition to the signal-timing improvements being implemented by local agencies within their jurisdictions, through AZTech, various high-traffic-volume arterial roadways across jurisdictional boundaries have been identified for traffic-signal operational improvements. An example of such a corridor is Bell Road where three agencies initially collaborated to integrate signal systems across their jurisdictional boundaries. Traffic volumes along this corridor had reached capacity, and due to physical development constraints and extreme high cost for the addition of roadway capacity, an ITS solution was implemented with an immediate reduction of travel time as high as 25% depending on the time of day along the 10-mile corridor while at the same time accommodating an increase of 50% in average daily traffic.

The Bell Road corridor system, led by MCDOT, has been expanded to include 54 signals covering 26 miles and now includes six local agencies. Additional signal-timing plans have been developed to cover traffic variations through different times during the day. As an ongoing enhancement to the system, a feasibility study of adaptive signal-control technologies was completed along four segments on Bell Road and based on these recommendations, $2.8 million in federal funding was approved for design and implementation starting in 2014. AZTech also is implementing ITS improvements along other cross-jurisdictional arterials within the region.

**Out for a smart drive**
Research into new technologies has been part of the AZTech partnership. MCDOT, in collaboration with AZTech
members, has joined the U.S. DOT Connected Vehicle Initiative and implemented a connected vehicle test bed to research traffic-signal applications. The MCDOT SMARTDrive Program focuses on intersection priority for incident-response vehicles, and the application was demonstrated in March 2012 along a six-lane arterial, including six signalized intersections. The technology includes vehicle-to-vehicle and vehicle-to-infrastructure communications using dedicated short-range communication technology. Priority to enter the intersection is allocated depending on the vehicle location, direction and speed.

In the MCDOT test site, the technology was successfully illustrated for a fire truck, MCDOT incident-response vehicles and a transit bus approaching the intersection at the same time. The MCDOT SMARTDrive Program testing facility has been selected along with the Caltrans test bed to serve as the deployment facility for the Cooperative Transportation Systems pooled-fund study through a $1.8 million multi-modal intelligent traffic-signal systems project funded through the U.S. DOT and pooled-fund partners. Expanding this technology to general vehicles in the future has the potential of considerably reducing intersection crashes.

A second ITS research application also was demonstrated at the test site. It involved handheld devices to assist pedestrians, including those who are visually impaired, by indicating the signal status through the handheld device. This technology will be further evaluated and refined for potential use in predominantly senior citizen residential areas within Maricopa County.

**Many saved**

The philosophy behind AZTech is based on a growing realization among government leaders that separate agency-centric transportation agendas serve neither their agency nor the traveling motorist. Through better integrated traffic-operations centers, AZTech has become a mechanism that not only developed new transportation technology, but also clearly demonstrated the significant and measurable advantages of a regional traffic-operations-related partnership that has directly resulted in saved time, saved money and saved lives. AZTech partners agree: The results are a more cost-effective use of resources for the agencies involved and a higher return on its initial $7.5 million investment than anyone could have ever imagined.

Swart is the division manager for the Maricopa County DOT.

For more information about this topic, check out the Traffic Management Channel at www.roadsbridges.com.

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