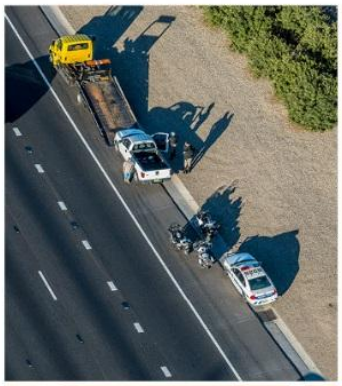

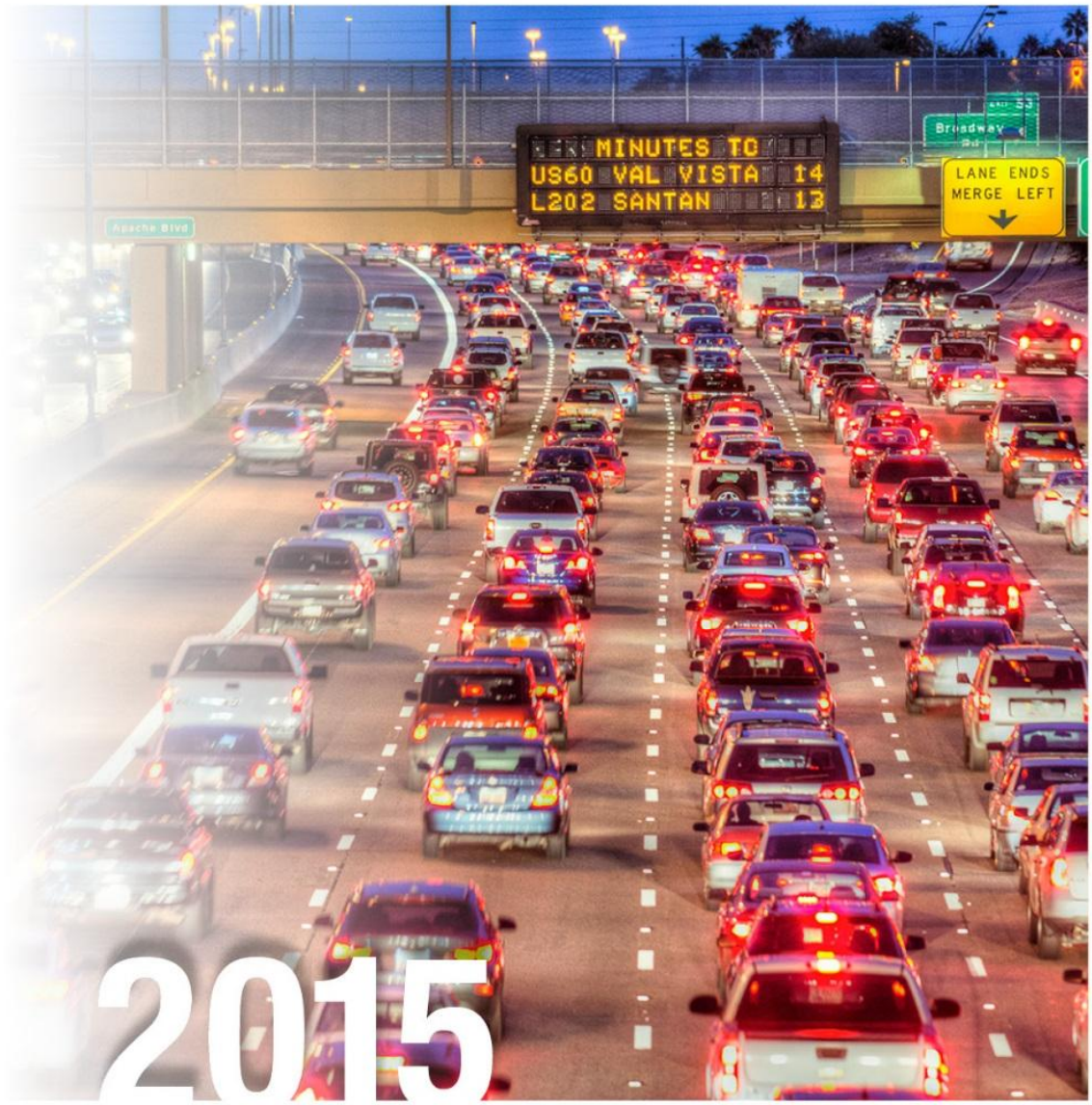

2015

AZTech OPERATIONS IMPLEMENTATION PLAN

AZTech™
Moving Forward Together

Acknowledgments

AZTech would like to acknowledge the partnership's public and private partners and contributors to this Plan:

Arizona Department of Public Safety

Arizona Department of Transportation

Arizona Division of Emergency Management

Arizona State University

University of Arizona

City of Avondale

City of Chandler

City of Glendale

City of Goodyear

City of Mesa

City of Peoria

City of Phoenix

City of Scottsdale

City of Surprise

City of Tempe

Town of Buckeye

Town of Fountain Hills

Town of Gilbert

Town of Paradise Valley

Town of Queen Creek

Federal Highway Administration

Maricopa Association of Governments

Maricopa County Department of Emergency Management

Maricopa County Department of Transportation

Maricopa County Sheriff's Office

Phoenix Sky Harbor International Airport

Valley Metro

Phoenix Fire Department

Arizona Broadcasters Association

Kimley-Horn and Associates, Inc.

OZ Engineering

Total Traffic & Weather Network

List of Acronyms

AASHTO – American Association of State Highway and Transportation Officials

ABA – American Broadcasters Association

ALERT – Arizona Local Emergency Response Team

ARIS – AZTech Regional Information System

ASSC – AZTech Strategic Steering Committee

ASU – Arizona State University

ATM – Active Traffic Management

AZDPS – Arizona Department of Public Safety

CCTV – Closed-circuit television

CMM – Capability Maturity Model

CV – Connected Vehicles

EMS – Emergency Medical Services

FHWA – Federal Highway Administration

ICM – Integrated Corridor Management

IGA – Intergovernmental Agreement

IMSA – International Municipal Signal Association

ITE – Institute of Transportation Engineers

ITS – Intelligent Transportation Systems

MDI – Model Deployment Initiative

PD – Police Department

RADS – Regional Archive Data System

RCN – Regional Community Network

REACT – Regional Emergency Action Coordinating Team

SHRP2 – Strategic Highway Research Program 2

SRPMIC – Salt River Pima Maricopa Indian Community

TIM – Traffic Incident Management

TIP – Transportation Improvement Program

TMC – Traffic Management Center

TOC – Traffic Operations Center

TSM&O – Transportation System Management and Operations

1. Purpose of the AZTech Operations Implementation Plan

AZTech began as a Federal Highway Administration (FHWA) Intelligent Transportation Systems (ITS) Model Deployment Initiative (MDI) for the Phoenix metropolitan area in 1996. As part of the MDI, AZTech's mission was to provide a champion for the integration of intelligent transportation and communication systems technologies focused on the creation and expansion of regional solutions that reduce travel time, reduce travel cost, and improve the safety of the traveling public. Since completion of the MDI, AZTech has evolved into an ongoing regional operations initiative that continues to pursue opportunities resulting in increased inter-agency collaboration between state, county, MAG, cities and towns across the greater Phoenix metropolitan region. AZTech has become an integrating mechanism that has demonstrated the distinct advantages of a regional operations-related partnership.

In 2009, AZTech Committees and Working Groups developed an Operations Action Plan that built on the outcomes of the FHWA Operations Opportunity State assessment and discussions. An additional effort was a pilot of the Capability Maturity Assessment, jointly developed by the American Association of State Highway and Transportation Officials (AASHTO), FHWA and Strategic Highway Research Program 2 (SHRP2). Outcomes of these efforts, as well as ongoing collaboration among key AZTech Committees and Groups, formed the basis for the priorities identified in the 2009 Operations Action Plan.

Since the 2009 Plan, there have been many key achievements that have helped to elevate Transportation System Management and Operations (TSM&O) among the partners. AZTech partners have helped to advance Integrated Corridor Management (ICM), Connected Vehicles (CV), and traffic incident management (TIM). Agencies have embraced new tools, including widespread use of social media for traveler information alerts, third-party speed data for freeways and arterials, and the award winning AZTech Regional Information System (ARIS), which sends customized alerts to agency subscribers. A 2014 AZTech Capability Maturity Assessment conducted as part of the L01/L06 Organizing for Reliability Initiative identified additional recommendations to help advance the AZTech partnership toward a more collaborative approach to TSM&O.

This Plan provides a five-year vision for operational strategies and collaboration to help advance key operations initiatives, including ICM and the associated operations, expanding the TIM Coalition, developing a business case and messages for ITS and TSM&O, and preparing this region and AZTech partners for next-generation system management and operations.

The 2015 AZTech Operations Implementation Plan was developed with input from each AZTech Committee and Working Group. The 2015 Plan will inform priorities for AZTech, and identify specific project opportunities for MCDOT, ADOT and other AZTech partners. This plan was also informed by the results of a SHRP2 Capability Maturity Model (CMM) workshop that was conducted with AZTech members. AZTech's organizational structure also has been updated to be able to place more emphasis on TSM&O initiatives and to facilitate consistent development and implementation of TSM&O strategies through improved collaboration among AZTech partner agencies.

2. AZTech Highlights and Successes

Since the development of the 2009 Plan, AZTech partners have advanced several important initiatives and priorities.

2009 Focus Area	*Key Achievements*
We Have a Well-Informed Traveling Public	• Travel times expanded across valley freeways and arterials • ARIS distributes real-time, customized alerts to agencies • Social media pushes alerts and notifications
Performance Measures Tell Our Story	• AZTech Operations Performance Indicators Book published bi-annually since 2011 • Data needs for performance tracking guide data collection strategies • TIM performance measures initiated as part of the TIM Coalition, including TIM Self-Assessment • Annual travel time measures for identified arterials
Upper Management, the Public and Elected Officials Understand and Appreciate Our Value	• Arizona hosted a Regional Operations Forum in 2014, which included attendees from ADOT and MAG • Agencies are re-organizing to better support TSM&O – including planning, operations and maintenance needs
There are Seamless Operational Partnerships Between Agencies and Departments within Agencies	• Focus on ICM and alternate routing helps to elevate the priority for better agency coordination • Loop 101 Incident Management and ICM launched in 2014, successful alternate routing, arterial management and TIM strategies • Agreements are moving forward to allow for joint operations of arterials (MCDOT implementing pre-determined signal plans for Phoenix)
We Leverage Our Regional Infrastructure for Operational Efficiency and Redundancy	• ARIS leverages data from multiple agencies to create robust alerts of real-time incidents and impacts • Bell Road Adaptive Signal control Technology Project (7 partner agencies)
Incident Management is Responsive and Effective on Freeways and Arterials	• TIM Coalition established bringing together state and local law enforcement, Fire/EMS, towing and transportation • AZDPS located at ADOT TOC to facilitate better TIM coordination • Multi-agency TIM training implemented • REACT/ALERT/Scottsdale partnering for ICM alternate routing strategies
We Have Qualified, Well-Trained Staff and a Pipeline of New Talent	• MCDOT, MAG and ITS Arizona continue to seek out cost-effective training options to bring to Valley transportation agencies • AZTech developed a white paper on operations certification, which has been advanced at the national level • AZTech Operations Committee technology training and discussion topic sessions

Collaboration Successes

The planning and execution of traffic operations for the Super Bowl was a major success for both regional operations and collaboration between agencies. With multiple agencies involved in events over the week prior to the game, planning and real-time execution of Super Bowl traffic management facilitated coordination and cooperation between ADOT, the City of Phoenix, and the City of

Glendale to develop improved coordination processes to provide safe and efficient travel for visitors and residents during the event. Agencies also collaborated on video sharing capabilities to provide national security and NFL stakeholders with the ability to monitor key areas in real-time. While the Super Bowl was a single event, the collaboration efforts opened the way for improved communications between agencies and an ability to work together that goes far beyond the timeframe of the Super Bowl and has set the stage for more positive, regional operations in the future.

A Traffic Incident Management Coalition was established, led by Arizona Department of Public Safety (AZDPS). This TIM Coalition spearheaded multi-agency TIM training and standardized TIM debriefing processes for major incidents on freeways. The Coalition involves state and local responders, including fire, towing/recovery, MCDOT Regional Emergency Action Coordinating Team (REACT), ADOT Arizona Local Emergency Response Team (ALERT) and law enforcement. The TIM Coalition has formalized performance measures for incident response.

The regional focus on Integrated Corridor Management has elevated the priority for improving freeway and arterial coordination, particularly when incidents close freeways and traffic is detoured on to arterials. AZTech developed ICM recommendations for key corridors in the metro area, which were adopted by the MAG ITS Committee. A very successful pilot program was launched on Loop 101 in Scottsdale, involving ADOT, AZDPS, MCDOT, the City of Scottsdale and the Salt River Pima Maricopa Indian Community (SRPMIC). It included detailed arterial routes for when sections of Loop 101 in Scottsdale are closed due to an incident. MCDOT's REACT team has expanded to be able to provide support for ICM and freeway closures requiring detours on to arterials.

Formal agreements between MCDOT and ADOT and between ADOT and the City of Phoenix are completed. An agreement between MCDOT and the City of Phoenix is in process to allow MCDOT to provide after-hours support for when an incident detours traffic onto Phoenix arterials. This will allow MCDOT and REACT to implement pre-approved timing plans from the MCDOT Traffic Management Center (TMC).

ADOT's Traffic Operations Center includes AZDPS officers on-site to coordinate during incidents impacting peak travel hours on Phoenix area freeways. Public Information Officers from ADOT provide 20-hour-per-day coverage for travel alerts and notifications.

A formal agreement was established to co-locate DPS officers at the ADOT Traffic Operations Center (TOC) to help improve incident monitoring and response times. The DPS officer in the TOC has the authority to immediately notify the DPS dispatch center and mobilize field officers and other emergency responders. Having direct DPS involvement in incident identification ensures that the proper resources are deployed to the scene and can help improve incident response time, which reduces the risk of secondary crashes. It also facilitates the dissemination of timely and consistent information to the traveling public.

Connecting Travelers with Real-Time Information

Bi-annual summits with local media partners (television, radio, traffic information reporting), transportation operations and public safety help to improve the consistency of information and collaboration among key partners. The 2015 Arizona Broadcasters Association (ABA) – AZTech media Lunch Forum highlighted the importance of getting real-time data for key arterials in the valley; many of these correspond to ICM related corridors. Media in particular is interested in obtaining arterial video images on key routes, as this helps to support their notifications to the public.

The freeway travel time program has grown from a pilot to providing travel times for freeways across the valley seven days per week. The number of signs, destinations and operational hours have increased significantly, including a major expansion in August 2015.

Several highly visible systems, such as travel times, operations for major events and social media presence has helped to elevate understanding of some agencies' operations programs.

Social media is used by many agencies as the primary notification method for major incidents and closures. ADOT expanded its public information/communications staff at the TOC and provides 20-hour per day coverage for social media alerts. MCDOT has expanded the use of Twitter for incident notifications. Many cities have also expanded their social media presence to be able to send alerts for major transportation impacts.

Advancing Technology to Support Operations

MCDOT's ARIS, launched in 2014, collects and distributes customized real-time traffic incident information to local TMCs throughout the County. Information includes closures, restrictions and incidents. Agencies can specify areas and corridors for which they would like to see incidents and restrictions. This was a collaborative effort between MCDOT and ADOT. ARIS was recognized by the Institute of Transportation Engineers (ITE) Transportation System Management and Operations Council with an Achievement Award.

AZTech continues to serve as a showcase for new tools and technologies to support improved mobility and safety on the region's road network. Agencies are deploying cost effective data collection strategies (such as Bluetooth) and agencies have access to probe data to support operations and performance monitoring. MCDOT, ADOT, University of Arizona and other partners serve as a national showcase for Connected Vehicle technologies, most notably with the test bed in Anthem.

AZTech now develops and publishes a bi-annual Operations Performance Indicators book, which captures key freeway, arterial, incident management and transit operations performance outcomes. An important element is identifying standard arterial corridors that would be candidates for additional data collection to be able to capture improvements of agency coordination and traffic signal timing changes over time.

There has been a significant increase in the number of agencies that have centralized traffic signal management systems. Although the level of connectivity to and control of signals that each agency has achieved varies, almost every agency in the region has a form of central management, which is foundational to future connectivity for all signals in the region.

The number of agencies connected to the Regional Community Network (RCN) has increased drastically, which facilitates an increase in regional data collection through ARIS as well as data sharing between agencies. Connection through the RCN helps reduce jurisdictional barriers to operations by enabling agencies to better coordinate their systems and provide a more efficient regional transportation and data network, rather than operating in isolation.

Partner Organizations Structure to Better Support Operations

In 2015, the Arizona DOT established a Transportation Systems Management and Operations Division. This change has resulted in key planning, operations and maintenance functions under the ADOT TSM&O umbrella. Earlier in 2015, MCDOT established a Transportation Systems Management Division, which includes traffic engineering and operations, signal operations, ITS, program management and systems planning.

AZTech also re-evaluated its structure in 2015. Moving forward, AZTech will develop an Annual Action Plan to outline key objectives for the coming year, which will be based on the overarching goals contained in this Operations Implementation Plan. The AZTech Strategy Task Force, renamed the AZTech Strategic Steering Committee (ASSC), will focus on consistent development and implementation of TSM&O initiatives. The ASSC will continue to serve as a liaison between the AZTech Executive Committee and all of the AZTech Committees and working groups to promote TSM&O. AZTech will re-focus the Advanced Traveler Information Working Group to focus on outreach for TSM&O in addition to traveler information. This will engage public information/communications staff, the media and transportation to collaborate on improving information provided to the public as well as developing a communications strategy to educate leaders and the public on next-generation operations initiatives.

3. Challenges and Gaps

AZTech partners have provided feedback on their key challenges, as part of an Operations Implementation Priorities workshop in 2015, as well as through the individual Committees, Working Groups and Task Forces. Gaps are documented in the attachment to this Plan, and will continue to be tracked over the next five years. Important gaps raised across several groups include:

- TSM&O needs the right staff with the right skills, and agencies need a way of providing training on new and emerging technologies and operations strategies. Operating and maintaining additional infrastructure will require that sufficient resources be allocated to those functions.
- There needs to be consistent infrastructure across borders to facilitate coordinated operations and advance ICM. Infrastructure gaps on arterials need to be addressed.
- Real-time arterial data, as well as accurate data on planned events (such as construction) remain an important gap for operations. Agencies need to explore options for obtaining data from within their agency, as well as on key arterials. The region needs to understand how to best use that data to support real-time system management activities.
- Articulating the TSM&O message – to the public, to elected officials and to agency decision makers – is a top priority, and one that will continue to be a priority as partners implement new collaborative operations, such as ICM and Active Traffic Management (ATM).
- Partners need to continue to prepare for new technologies. Already a leader in Connected Vehicles, agencies need to understand the future impacts of a rapidly evolving mobile environment, as well as understand what new partnerships might be needed.
- Elevating the multi-modal system management capabilities is an essential component to overall system operations. Integrating transit, bicycle and pedestrian needs into real-time system-wide operations will require formalizing partnerships and exploring non-vehicular technologies.

4. Developing the Operations Implementation Plan and AZTech Priorities

The 2015 Operations Implementation Plan was developed with active participation from each AZTech Committee and Working Group. These teams are the ones that have helped to advance the priorities from the 2009 plan, and will be the champions for advancing the new priorities and focus areas. An AZTech Capability Maturity Assessment in 2014 also provided input on areas for improved collaboration and coordination.

AZTech has been spearheading initiatives to create an operations certification program that captures operations skill sets and capabilities, and this is helping to shape national guidance on operations staff capabilities.

Many 'last mile' gaps have been closed, and AZTech partners are addressing needed connections that are just a few feet to be able to connect key communications infrastructure.

AZTech identified the following operations focus areas:

- We have a well-informed traveling public
- We have qualified, well-trained staff and a pipeline of new talent
- We leverage our regional infrastructure and partnerships to support proactive system management
- Incident management is responsive and effective on freeways and arterials
- Our performance measures tell our story
- Upper management, the public and elected/appointed officials appreciate our value
- Technology supports operations innovation

Focus Area: We Have a Well-Informed Traveling Public

Successes

- **Travel time program** – expansion of travel times on many freeways and arterials and the extended hours that travel times are being displayed
- **Media partnerships** – AZTech actively partners with local media to collaborate on how to improve real-time information sharing, and identify priority information needs from the public's perspective. Media summits provide an opportunity for transportation and media industries to interact and coordinate
- **Data collection** – AZTech partners have improved and expanded their data collection capabilities, improved the processes for collecting and sharing data, which translates into improved quality of information that is shared with agencies and the public
- **Social media** – many agencies, including ADOT, MCDOT, AZDPS and local agencies have adopted social media strategies (namely Twitter) to provide real-time information to their followers, which include the media, other agencies and the public
- **Information for major events** – successful planning and execution of multiple, high profile events has improved the quality and consistency of information being shared (such as the Super Bowl)
- **AZTech Regional Information System (ARIS)** – enhancements in available data and upgrades to the Regional Archive Data System (RADS) has resulted in this award-winning information sharing tool

Implementation Strategies

- Continue to improve inter-agency information sharing
    - Increase agency awareness of ARIS and develop enhanced situational awareness capabilities
    - Increase the availability of real-time arterial information to the public and the media
        - Real-time information: travel road conditions and incident information
        - Planned events: planned special events and construction events
        - Identify appropriate dissemination strategies for arterial information
    - Standardize social media usage procedures and message format
        - Standardize hashtags to make sure all agencies receive notifications
- Public information dissemination
    - Improve how agencies use data that is available
    - Provide information in new, innovative formats and applications to reach a broader audience
    - Develop a one-stop-shop location for regional travel information
- Partner with the media and other private agencies to distribute information that will help elevate public knowledge and awareness
    - Increase public awareness of information that is available and where to find it
    - Improve public awareness of ITS and TSM&O concepts (such as ICM and ATM)
    - Develop a strategy for how to package and communicate operations messages that are clear, concise and consistent
    - Improve driver education regarding rules of the road, the quick clearance law and general traffic philosophy
- Align data collection and reporting priorities with ICM corridor operations and alternate routing
- Develop a targeted strategy for information sharing with freight/goods movement

Focus Area: We Have Qualified, Well-trained Staff and a Pipeline of New Talent

Successes

- **Operations Certification Process** – AZTech's white paper received national recognition and partners are helping to shape national recommendations
- **Multi-agency training** – AZTech promotes this and is always looking to identify opportunities
- **National attention for TSM&O** – this region has gotten national attention and is an example of best practices; this is also a key challenge for going forward because we do not have many other agencies to look to for new innovations or lessons learned
- **Shared operations and leveraging other agency assets** – examples include Phoenix Intergovernmental Agreement (IGA) with MCDOT TMC, DPS co-location at ADOT TOC, Scottsdale Police Department (PD) and TMC during special events, and Tempe PD and Arizona State University (ASU) in Tempe TOC during special events. MAG and ADOT technical staff also help to support technology troubleshooting for local agencies.

Implementation Strategies

- Supporting existing staff
    - Provide staff redundancy as back up if a staff member is unavailable
    - Identify funds to improve staff training (especially with restrictions on travel)
    - Make better use of technology to enable staff to operate key systems remotely
- Facilitate cross training and staff transition to reduce impact of staff retirement and turnover
- Define the staffing resources that will be needed for the region as a whole (i.e. the sum of all individual needs) to support future operations
    - Identify opportunities to designate regional resources to support operations and technical needs (building on MCDOT and PHX IGA model)
    - Be proactive in identifying new/additional staff skills and training that will be needed with the development of new operational strategies (ICM, ATM, CV)
- Identify opportunities for AZTech to participate in university/college programs and engage students
    - Develop standardized presentations/topics about ITS and TSM&O that can be presented at associations and universities by an AZTech partner
    - Identify and compile a list of existing resources on ITS and TSM&O (ex: ITS America) and share them with universities and colleges to increase awareness
- Improve process for recruiting and retaining the right staff
    - Improve job descriptions by using Mesa job descriptions as a reference
    - Educate agency human resources so they understand differences and specific needs for TSM&O
    - Support agencies with information to better define specific TSM&O roles
    - Identify the realistic costs to local and regional agencies for supporting future applications such as ICM, ATM, and CV
- Support the development of certifications and trainings that meet regional TSM&O needs and provide operators and staff with skills that are nationally recognized
    - Continue to work with the International Municipal Signal Association (IMSA) and their training-for-operators program that is in development

Focus Area: We Leverage Regional Infrastructure and Partnerships to Support Proactive System Management

Successes

- **Loop 101 ICM and Incident Management** – The Loop 101 ICM is a big success in Scottsdale (City, AZDPS, ADOT, REACT expansion, SRPMIC), has helped improve incident response, and has received national recognition
- **ICM –** ICM and its operational needs are a regional priority. ICM needs are elevating the priorities for freeway/arterial alternate routing, arterial instrumentation needs. ICM is identified as a Transportation Improvement Program (TIP) funding priority through the MAG ITS Strategic Plan.
- **City of Phoenix/MCDOT operations IGA** – Formal agreement that facilitates operation of Phoenix signals by MCDOT, based on preapproved and predetermined signal timing plans.
- **Use of shared resources for regional coverage** – Key examples include closed-circuit television (CCTV), DMS, signal systems, and other data through RADS
- **Closing last-mile gaps** – AZTech partners have addressed several key gaps in fiber and conduit; last-mile is now just a few feet to connectivity
- **ARIS** – this was implemented and now provides real-time information alerts to local agencies regarding incidents and other traffic conditions
- **Regional Community Network** – The RCN supports interagency connections and improved communications and sharing over a secure network
- **Bicycle and pedestrian initiatives** – There has been significant coordination amongst agencies to support bicycle and pedestrian movements

Implementation Strategies

- Expand discussions for Active Traffic Management and Integrated Corridor Management
    - Expand ATM and ICM concepts and alternate routing concepts to other corridors (Loop 101, I-10 and I-17 are under study). Consider needs for those corridors that do not have convenient alternate routes
    - Expand the sources of arterial data (or improve the ability to obtain data from ITS equipment)
    - Develop and modify policies to better support collaborative operations, enable alternate routing, and shared or joint operations
    - Support implementation of responsive signal timing on arterials, and identify realistic needs and costs for agencies to support these signal timing strategies
- Establish protocols for providing after hours traffic and incident management services to local agencies
- Continue to expand infrastructure and technology sharing
    - Connect more agencies to the RCN
    - Expand CCTV sharing to include transit, additional public safety and media partners
    - Standardize equipment and protocols throughout the region to make collaborative operations seamless across jurisdictional boundaries
- Expand formal coordination efforts for multimodal operations, and engage transit operations in AZTech discussions

Focus Area: Incident Management is Responsive and Effective on Freeways and Arterials

Successes

- **AZTech TIM Coalition** – The TIM Coalition, led by AZDPS and with participation from state and local transportation agencies, fire/emergency services, law enforcement and towing, provides a forum to address incident debriefings, monitor performance metrics, and discuss how incident response and management can be improved on freeways and arterials. The Coalition has developed a Charter to formalize the goal and activities of the group.
- **Multi-Agency TIM Training** – Spearheaded by AZDPS and partners, the multi-agency TIM multi-agency training has been a big success and has put Arizona on the map as a national leader
- **REACT Expansion** - Recent expansion to Scottsdale to support Loop 101 traffic incident management closures and arterial routing.

Implementation Strategies

- Expand the TIM training base
    - Work to close gaps: fire, local police and local maintenance/Public Works
    - Outreach to high-ranking fire/police to get support for local agency participation
    - Update training with local examples and photos to make it more relevant to local audience
    - Look for opportunities to make TIM training more prominent in local training activities, such as Palo Verde
- Develop public awareness strategies
    - Move over/quick clearance laws – what motorists should do when they come upon an incident scene
    - Work with the media for public messaging (leverage dust storm campaign)
- Implement a more formal process to audit and track TIM training activities
    - Number of active trainers and number of training sessions
    - Each agency's number of trained staff
    - Need a process to identify who has not participated in training
- Promote improvement to current notification processes for incidents and detours (between ADOT, AZDPS, various cities)
    - Need to understand how current processes work among state and local agencies, recognizing that lines of communication need to go both ways
    - Look to establish some standardized notification processes across the metro area (similar to the concepts in the Loop 101 plan)
- Advance ICM region-wide (see "leverage regional infrastructure and partnerships")
- Expand discussion on towing in relation to TIM collaboration
    - Implement a system to track towing companies that have completed TIM training and have it be part of contract qualifications
    - Discuss concerns on specific tow liability

Focus Area: Performance Measures Tell Our Story

Successes

- **AZTech Operations Performance Indicators Report and Dashboard** – In 2011, AZTech initiated the Operations Performance Indicators report to capture key freeway, arterial, TIM and transit operations performance metrics. This process continues to expand and improve, and issues a comprehensive report and dashboard every two years.
- **Data Identification** – Elevating the importance of active performance monitoring has informed priority data needs, particularly for arterials. Agencies are seeking innovative ways to capture real-time data on arterials to improve operations; this has an added benefit of feeding performance monitoring objectives.
- **Arterial Traffic Signal Performance Data** – Most agencies in the Valley are supporting performance metrics with data on a select number of intersections. Partners are implementing innovative signal performance monitoring activities using the Purdue applications.
- **ADOT Research** – ADOT is conducting research on TIM performance measures related to reducing and mitigating secondary crashes, which will help inform traffic incident management processes and improve safety of the public and first responders

Implementation Strategies

- Expand data sources and coverage to support operations and performance monitoring
    - Obtain better roadway utilization data on arterials, and expand data collection coverage on arterials (can align with ICM needs)
    - Encourage consistent data across the region to conduct performance measures as well as support coordinated operations
    - Obtain static information in addition to real-time information (such as events and construction activities)
- Improve how data is turned into usable information
    - Improve processes to analyze data from ITS equipment and other sources (such as probes)
    - Develop tools and resources to support turning data into information, and automate reporting processes
    - Identify how to integrate performance data into real-time operations
- Performance Measurements
    - Improve performance measurement for ITS elements, link data to device asset management and lifecycle planning
    - Collect and assess customer satisfaction measures
- Develop a Communications Plan and Strategy
    - Share/promote the AZTech indicators, successes, lessons learned to key staff and executives within agencies
    - Look for creative ways to articulate benefit-to-cost of TSM&O initiatives, successes, and developing public awareness of ITS and operations activities
    - Roll-out AZTech indicators on a national level

Focus Area: Upper Management, the Public and Elected/ Appointed Officials Appreciate our Value

Successes

- **"Visible" systems have an impact** – Several important initiatives that provide visible results, such as freeway and arterial travel times, social media, and noticeable collaboration for major events have been highly successful
- **Operations Academy/Regional Operations Forum** – Arizona was a host site for a SHRP2 Regional Operations Forum. Attendees from Arizona included ADOT and MAG. Arizona also sent AZDPS and City of Phoenix delegates to the National Operations Academy
- **Performance indicators** – there has been a good focus on performance measures and the efforts to find the right messages to convey

Implementation Strategies

- Improve awareness of TSM&O capabilities and resources
    - ITS awareness with some agencies' upper management – there is currently a lack of understanding of what ITS does and does not do
    - Improve awareness of key response resources such as REACT, ALERT, and DPS by other agency responders
- Improve and standardize how TSM&O is communicated
    - There is not a single clear message on TSM&O (systems, benefits, etc.) in the language that the public and upper management understand
    - Talking points and information dissemination procedures for media and elected officials need to be standardized
    - Develop and communicate a business case for TSM&O and AZTech's role
    - Develop specific messages for ICM ATM, where operations will be highly visible to the public
    - Integrate media as partners in communicating concepts to the public
- Develop more champions for TSM&O in upper management
    - ADOT and MCDOT have already formalized specific TSM&O Divisions and leadership
    - Identify candidates for future National Operations Academies
- Support the re-branding (improve visibility) of traffic management functions within agencies to elevate them to the same level as planning and construction (and potentially improve funding priority)

Focus Area: Technology Supports Operations with Innovation

Successes

- **Connected Vehicles** – Arizona is a national leader in a range of innovative applications. Test bed in Anthem is a highly visible showcase on the national and international scales.
- **Web-based systems** – Transition to web-based systems supports increased agency connectivity by improving ease of access and lowering costs (amongst other benefits)
- **Alternative data sources** – More AZTech partner agencies are using alternative data sources such as Bluetooth and probes to help expand situational awareness on freeways and arterials.
- **Active Traffic Management and Integrated Corridor Management** – Arizona an early adopter of ATM strategies to address freeway congestion and safety. Local ICM initiatives were part of a national scanning tour that brought attendees from all over the country for a tour and peer exchange.

Implementation Strategies

- Discuss how to fully utilize new technology in a cost effective manner, especially with large amounts of data from the new systems that are being implemented
    - Identify the right partners that are needed considering next-generation operations, connected vehicles, and the rapidly evolving mobile environment
- Better manage technology and equipment lifecycles in a fast-past environment
    - Technology turnover is getting shorter and it is a challenge for agencies to respond
    - Long-term planning for near-term technology opportunities
    - Standardize equipment and infrastructure to be able to take advantage of shared resources and economies of scale
- Stay informed of national and international best practices and new developments in technology
    - Take advantage of opportunities through peer exchanges (virtual and in-person), webinars, and other training formats.
    - Share information with and among partners
- Look for the best ways to leverage systems and technology to support better multimodal coordination
    - Transit has their own suite of innovative tools. Continue to seek opportunities to improve coordination and data exchanges with transit to improve both transit and surface street operations.
    - Formalize agreements between AZTech and Valley Metro to support data and video exchange.

5. Implementing the Plan

The AZTech Operations Implementation Plan serves as an overarching framework for AZTech priorities. The goal is for AZTech Committees and Working Groups to leverage the priorities identified in the Plan to guide activities and discussions within the individual Committees and Working Groups.

The AZTech Strategic Steering Committee will develop an Annual Action Plan that will be in concert with each Committee and Working Group for approval by the Executive Committee. The Annual Action Plan will draw from the strategic priorities in the Operations Implementation Plan.

The AZTech Strategic Steering Committee intends to review the Operations Implementation Plan on a bi-annual basis to identify any new priorities that should be reflected. The Committee intends to do a full update of the Operations Implementation Plan every five years (maximum), or as needed.