

# AZTECH REGIONAL ARCHIVED DATA SERVER

By: Maricopa County Department of Transportation

## IN THIS CASE STUDY YOU WILL LEARN:

1. How a collaborative development led to a Regional Archived Data System (RADS) for traffic management.
2. How the RADS platform has enabled a secure data feed from multiple public safety agencies to provide a centralized source of freeway and arterial incident information.
3. How centralizing data limits the need for multiple redundant servers and licenses throughout the region, resulting in cost savings.



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## BACKGROUND

AZTech partners, led by the Maricopa County Department of Transportation (MCDOT) and the Arizona Department of



**Maricopa County**  
Department of Transportation

Transportation (ADOT) have been archiving data generated by their ITS programs for several years, but to date, these have been in separate archival databases. As ITS was deployed in more jurisdictions, the region needed a robust data management tool to support the evolving traffic management, system operations, data sharing, information dissemination and performance management.

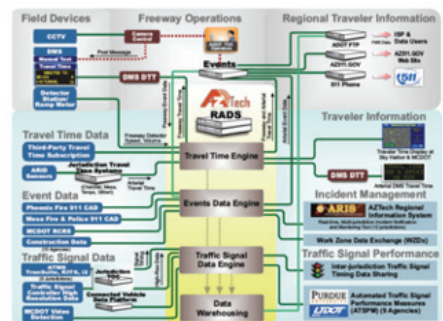


Continued emphasis on regional transportation operations has inspired MCDOT (as part of AZTech) to take the lead in developing a Regional Archived Data System (RADS). This system would serve as an essential data storage and processing resource to support active TSMO capabilities, TSMO performance monitoring and management, and system analysis functions. The RADS database has been built out over time, beginning in the early 2000's, and in tandem with increasingly more complex system operations capabilities and functions in the Maricopa County region. RADS ingests information from traffic and incident management systems throughout the Phoenix Valley, stores it in a centralized archived data server, processes and enhances data and makes it available for a variety of stakeholders via a web interface applying national ITS standards. It will continue to be an important tool for the region as more advanced Integrated Corridor Management and decision-

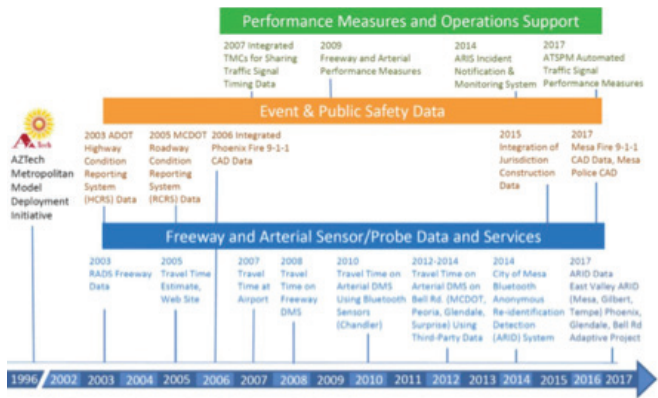
support capabilities are implemented through current projects. RADS is a key tool that supports several TSMO functions in the Maricopa County region, including traveler information, traffic management, agency notifications, traffic incident management and automated performance monitoring. The concept of RADS is to leverage emerging "big data" to improve the coordination of regional transportation operations. RADS serves several important functions, including those showcased in the graphics and the links in the Further Information box.

## TSMO PLANNING, STRATEGIES, AND DEPLOYMENT

RADS was initially developed to archive data generated by ADOT's Phoenix Freeway Management System (FMS), including detectors and incidents/events from the Highway Closure and Restriction System. In 2005, ADOT and MCDOT collaborated to develop a travel time function that would generate segment travel time estimates using ADOT's FMS detector data. Travel times would automatically populate specific dynamic message signs on freeways displaying the travel time estimates along a corridor. RADS also archives the detector data and associated travel times so that it is available for future analysis, and the travel times on corridors is used by the AZ511.gov web



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site and 511 phone service in addition to the DMS displays. ADOT and the Arizona DPS have a good relationship when it comes to sharing incident information for freeways, but MCDOT recognized that there was a significant gap in terms of notifications and awareness of arterial traffic incidents. It is estimated that 60% of travel in the Maricopa County area takes place on the arterial street network.

MCDOT initiated a partnership with Phoenix Fire in 2006 to integrate a filtered data feed of traffic-impacting arterial incidents from the Phoenix Fire Computer-Aided Dispatch (CAD) system. Phoenix Fire dispatched for more than 20 fire agencies in the Maricopa County area, so this data source provided vital arterial incidents for a substantial portion of the region’s arterial network. In 2017, Mesa Fire 911 and Mesa Police CAD data were also integrated into RADS, and discussions are underway to integrate other local agency incident data. RADS is now able to generate real-time alerts and notifications of arterial incidents, which were not previously available to transportation agencies or to the public. RADS data is integral to the AZTech Regional Information System’s (ARIS) real-time alerts that agencies can customize for specific geographic areas. RADS is the central processing subsystem for travel times from both ADOT freeway detectors and for arterials using third-party speed data and Anonymous Re-identification Detection (ARID) system sensors. These travel times can be provided to agencies, which is critical for monitoring cross-jurisdictional corridors, and are also provided to the public on regional applications including 511. Archived travel time data supports corridor performance management strategies. Analysis and reporting using RADS data is the foundation for the AZTech Operations Performance Indicators Book, which is compiled bi-annually by the AZTech partnership. In 2017, RADS deployed the Automated Traffic Signal Performance Measures (ATSPM) developed by Purdue University and Utah Department of Transportation. ATSPM collects and analyzes high-resolution traffic signal controller data in support of traffic signal timing performance analysis and troubleshooting. The AZTech ATSPM implementation deployed a central server, as part of the RADS, hosted in Maricopa County’s Transportation Management Center (TMC). Leveraging the regional fiber optic data backbone, the high-resolution traffic signal controller data are transmitted from the jurisdictional traffic operations centers to RADS over the Regional Community Network (RCN). This

configuration promotes the use of ATSPM by eliminating the need for individual jurisdictions to deploy and maintain a server.

## COMMUNICATIONS PLANNING AND EXECUTION

RADS is the result of collaborative efforts, with leadership provided by Maricopa County and active participation by several AZTech partner agencies, including ADOT, local cities, and public safety agencies. Data and analysis using RADS data is completed by several key AZTech committees and working groups, including the AZTech Strategic Steering Committee, AZTech Operations Committee, the Traffic Incident Management Coalition, and the TMC Operators Working Group. Performance results are shared with agency leadership, and help to identify trends, needs, gaps and focus areas for TSMO improvements. Through collaborative arrangements the RADS servers are housed at the ADOT TOC and the system is operated and maintained by MCDOT through on-call services provided by OZ Engineering. RADS development as a regional ITS data engine that supports data warehousing, data fusion and integration started in 2003 and the system developed incrementally based on Archived Data User Services (ADUS); user services defined in the national ITS architecture. AZTech committees provide important input as to needs and future RADS system enhancements to support next-generation operations and agency decision-making.

## OUTCOMES, LEARNINGS, AND PUBLIC BENEFIT

RADS has helped to address several important TSMO data management needs for agencies in Maricopa County. Through RADS, agencies can see and receive alerts about traffic-impacting incidents that could affect cross-corridor travel for multiple jurisdictions. The RADS platform has enabled a secure data feed from multiple public safety agencies to provide a centralized source of freeway and arterial incident information. Agencies are also able to benefit from centralizing ATSPM data, limiting the need for multiple redundant servers and licenses throughout the region, which has had significant cost streamlining and savings benefits. Using the data from RADS, trends, needs and gaps provide important inputs to agency TSMO priorities and decision-making on future investments. As the region’s TSMO capabilities expand, RADS also can be scaled and expanded to meet the needs of increasingly more complex corridor TSMO strategies. Future data management enhancements, including a corridor performance dashboard, transit data integration, capabilities to integrate incident review functions, and automating performance reporting will benefit the entire region.

### FURTHER INFORMATION

AZTech RADS Website: <http://www.aztech.org/projects/RADS.htm>

NOCoE Knowledge Center: <https://transportationops.org/knowledge-center>