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Mesa (AZ) Traffic Management Center (TMC) boasts the largest video display wall in the greater Phoenix area. It is comprised of 15 50-inch video cubes in a 10'x18' area.

TECHNOLOGY IN THE FAST LANE

Intelligent Transportation Systems' AV keeps traffic flowing.

BY JOHN STARK

Increasingly, new advanced Traffic Management Centers (TMCs) serve a critical role in the running of a city's streets to improve traffic flow, reduce tie-ups, identify trouble spots and respond to emergencies.

At the heart of these state-of-the art systems are large display walls that enable TMCs to display information from cameras, traffic detectors, computers, TV, cable and video, so operators can see what is happening on roadways and the effects of their decisions. And at the center of each display wall is a *display-wall processor* that enables the large display to pull inputs from many different sources, in many different formats, to size, and show them anywhere on the large screen. These display-wall processors provide almost instant, decision-ready information so operators can monitor traffic signals and intersections and track the flow of traffic on highways, throughout an entire city, or even, as in the case of Arizona, an entire state.

Display-wall processors are found in many of the country's traffic management systems, including the state of Arizona, which, in many respects, is leading the way in the use of new technology to improve a state's infrastructure and reduce cost. Advanced TMCs have been installed around the country in places such as San Francisco, Chicago, Orlando, Nashville, Phoenix and many others. All rely on a display-wall processor that is *built expressly for the control room* and for use in *any* display system. They enable operators to receive and display data, move the information to different locations on the wall, resize a window, or combine different types of data to best analyze and understand traffic conditions. These high-performance processors allow users to view and manage images from all of the data sources avail-

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Engineer's workstation with view of the large 5x3 cube display wall, which allows all operators and managers in the TMC to view the same images at the same time.

able to a traffic management center from a remote video camera, the internet, a high-speed network, TV, workstation, PCs or their own applications. The results are faster, better decisions, coordinated efforts—and a reduction in cost.

AZTech: Unique Partnership

Long considered one of the country's most progressive states in traffic management, Arizona has been leading the way in applying Intelligent Transportation Management systems. The unique statewide partnership, known as AZTech, enables some 70 government and private transportation agencies to share and coordinate critical information with regard to traffic flow, congestion and emergencies throughout the greater Phoenix area via a network of Intelligent Transportation Systems (ITS).

The suburbs of Phoenix AZ are a prime example. For many years, communities such as Mesa, Chandler and Glendale have been among America's fastest growing. New people bring new jobs, new tax revenues, new energy…and new infrastructure demands.

Mesa, for example, grew by nearly 40% in the 1990s, and now has a population of almost a half-million. Its mobile citizens drive more than 1200 miles of streets through 350 signal-controlled intersections, spread over a large geographic area.

Until recently, the city Department of Transportation monitored this vast system from an 860-square-foot room in which six operators worked with desktop computers, and had only the information they could collect from their own and their colleagues' workstations. Mesa's answer to its growing dilemma was to replace its older TMC with a new intelligent traffic system.

Audio Video Resources

Audio Video Resources (AVR), Phoenix AZ, has been providing professional-quality products and services to broadcast and industrial professionals for more than 50 years, offering integration solutions for boardrooms, conference centers, auditoriums, classrooms, lecture halls, houses of worship, broadcast and production facilities, traffic management, videoconferencing, and public spaces and stadiums. For more information, go to www.avrinc.com.

At the heart of the Mesa display wall is a display wall processor that enables the large display to draw inputs from many different sources and formats to size and show them anywhere on the large screen.

To do this, Mesa had several objectives:

- First, the city wanted to install a traffic-detection system that would send instant traffic information back to the center and alert systems operators of possible problems.
- Second, they wanted to use the information to analyze and simulate traffic data, to analyze or simulate the impact of a traffic incident or proposed traffic change, or adjust a light or the system.
- Third, they wanted a system that would provide communication to Mesa's Police, Fire and Emergency Operations Center, and a CAD dispatch system on events of mutual concern.
- Fourth, the Traffic Management Center required the capability to send out real-time information about traffic conditions and safety to the public through dynamic messaging signs, the media and the web.

Regional Initiative

Mesa's Traffic Department also became part of an innovative regional transportation initiative called AZTech, which brings together more than 75 public and private agencies throughout the "Valley of the Sun" to apply the latest technological tools to make the region's existing road network work better. AZTech has energetically implemented a family of technologies collectively known as Intelligent Transportation Systems. Historically, governments have responded to heavy and recurring traffic congestion by building new roads, but at enormous cost in both time and money. Using ITS tools for traffic management on the existing system can get motorists moving more quickly, safely and efficiently, reducing delays and saving money without a major construction commitment.

Audiovisual systems, including display walls, projection and conferencing, play key roles in ITS, but are only part of the story. A typical ITS implementation might include traffic detectors along the major highways and streets, network-connected video cameras, dynamic signage, emergency notification systems, etc.

The system can alert motorists in real time to avoid congested areas and communicate across jurisdictions to facilitate emergency response. Supporting all of this functionality is the ability to gather information quickly, transmit it immediately to where it is needed, and present it to decision makers in a clear and actionable form.

A visit to Mesa's new Traffic Management Center, designed and installed by Audio Video Resources, illustrates the powerful new tools at the city's command to help it manage both routine traffic flows and emergencies. The 3500-square-foot control room boasts the largest videowall in the greater Phoenix area, a 10'x18' array of 15 50-inch Toshiba video cubes. This big wall allows all operators and managers in the TMC to view the same images simultaneously.

Rear view of the videowall, including the custom base and ceiling supports fabricated by AVR to ensure safety and proper alignment.

Moreover, all this video real estate can be subdivided in almost limitless ways. Individual cubes can be dedicated to specific displays, or combined with others to make larger displays. Each cube can also display multiple windows of video or data. All in all, the videowall can meet virtually any display necessity that might arise.

Processor

Driving this versatility is a high-performance display wall processor that can control an array of up to 32 digital or analog projectors with resolution of up to 1600x1200 pixels per projector. An integrated matrix switch allows any input channel to be directed to any output window. Video windows can be scaled and moved, or stored on the display wall as icons that can be opened with a click.

Inputs reaching the TMC include feeds from traffic cameras, data from sensors, even local weather and news reports. A functional LAN connects all of the TMC offices, giving everyone easy access to the central files. From the TMC, managers can access real-time traffic information, adjust signal timing, model and simulate the impact of accidents, communicate with police, fire and other services, and send out real-time messages to the public via dynamic messaging signs, the media and the web.

One of the key growth areas for display-wall controllers is the high-end traffic-management center. The sheer number and variety of data inputs these centers must accommodate, along with the user's demand for flexibility in display options and fast access to actionable information, all create an ideal application for display-wall controllers.

The facility must also function as an emergency response center and continue to function in the event of an incident or storm. The Mesa DOT also wanted to be able to give tours of the facility without interfering with ongoing work. To achieve this, a series of offices, a large meeting room and a supervisor's station were constructed adjoining the control center, with clear glass walls that provide a view of the display wall from anywhere.

More Performance

Mesa officials believe this application of information and display technology will help them get more performance from the city's existing road network. They estimate that efficiencies from the new system will save up to 2.5 million gallons of fuel and four million motorist hours each year. Traffic delays are expected to drop by more than 40% and the risk of accidents by up to 7%.

Through region-wide cooperation and aggressive adoption of powerful new technologies, these fast-growing communities are working to preserve the quality of life that has helped them grow.

Mesa's Smart Streets program offers a fully integrated traffic system with signal control, traffic detection, data sharing and coordination with other departments and agencies, and the provision of up-to-date traffic information to the public. It is based on a comprehensive communications network with a redundant fiberoptic backbone, and state- and city-installed conduits. ■