Communications Superhighway

By Dawn Allcot

Texas DoT's AV technology keeps traffic flowing.

This unassuming structure houses DalTrans, the Texas Department of Transportation's (TxDOT) new 54,000-square-foot, $10 million transportation management center.
Photo Credit :Scott Williams

Imagine driving to work, no time to spare before the big Monday morning meeting, when your GPS warns of traffic congestion ahead on your chosen route. It redirects you to another major thruway and you arrive at the meeting on time. The boss notices, especially since several of your colleagues, who lacked such high-tech systems, walked in late.

The technology to do this is available and affordable today in products such as the Dash Express internet-enabled traffic data system. But the information about the traffic must originate somewhere. If you live in the Dallas Metroplex region of Texas, it's coming from the Texas Department of Transportation's (TxDOT) new 54,000-square-foot, $10 million transportation management center, DalTrans.

TxDOT's Home Base

DalTrans is the home base of operations for TxDOT's new traffic management system, which is using Intelligent Transportation Systems (ITS) technologies. ITS is designed to better manage traffic congestion created by accidents and increasing volume, and to enhance vehicle throughput on more than 100 miles of North Texas roadway. By using available roadways more efficiently, ITS helps alleviate traffic problems without the time and expense (not to mention the negative environmental impacts) involved with building more and larger highways. According to a published case study, "ITS integrates innovative traffic monitoring technology with inter-agency coordination to provide a seamless transportation network."

In addition to 15 RGB Spectrum 4View multi-image display processors, the extensive AV and communications systems in the new facility include a massive Draper Diamond screen, five Panasonic rear-screen LCD projectors, ViewSonic LCD displays at eight monitoring stations and an Extron matrix switcher. Audio components include a combination of KSI ceiling speakers and Klipsch surface-mount speakers, all powered by Crown amplifiers. The system is controlled by an IP-addressable AMX NetLinx system via touchpanels or over the computer network.
The audiovisual and communications software was installed by CCS Presentation Systems' Dallas office, with Systems Sales Engineer Kim Ott directing the project design and implementation. The install was completed based on specifications and guidance from Rockville MD-based IT consulting firm Telvent. Making the ITS functional, said Telvent Senior ITS Engineer Joerg "Nu" Rosenbohm, required integrating the AV systems with TxDOT's statewide traffic management software.

Shared Space

The TxDOT shares the space with the Dallas Area Rapid Transit (DART) and with the Dallas County Courtesy Patrol. DART is responsible for operating and maintaining Dallas' HOV (high occupancy vehicle) lanes, whereas the courtesy patrol assists motorists whose vehicles have broken down. The three organizations work together to resolve transportation issues in the Dallas region. Having all relevant agencies under one roof provides huge benefits and helps the system work more effectively, according to TxDOT Freeway Management Engineer Rick Cortez.

The previous TxDOT building was only 2200 square feet, "the size of a small to medium-sized house," Cortez said. They had a similar system, but

it was staffed in different locations. “Our main goal here was getting more players in the same room. We still have room to expand and we have interest from other agencies to bring personnel into this building,” he offered. “If they are a good fit for us, it would be great to coordinate with other agencies, as well.”

The new building is also miles ahead in technology. The previous facility used 21 CRT monitors stacked in three rows of seven, and one 60-inch screen with a projector. “It was just a way to get the image into the room,” Cortez said.

The AV systems in the new facility give TxDOT and the other organizations enhanced picture quality and the ability to put multiple images on the screen and view them simultaneously, instantly change display arrangements from four-window quad configurations to full-screen, and to “zoom in” on particular images and bring them down to the monitor at any one, or more, of the eight workstations on the Emergency Operations Center (EOC) floor.

Other EOC Responsibilities

The EOC is also used to handle weather situations and, should the need arise, homeland security emergencies. The building was conceptually designed by Telvent, and architecturally designed by HLM Architects, Inc., which was acquired by Rees Associates, Inc., during the course of the project. The facility includes several conference rooms, executive offices, a divisible training room and a media/viewing room. The viewing room is situated to the rear and slightly above the EOC, with a large window that opens into the room so members of the media can see everything going on in the EOC. The main conference room, called the Emergency Management Room, is on the second floor above the viewing room, overlooking the EOC, whereas the training room shares the first floor with the EOC.

The Emergency Management Room has the same functionality as the EOC, with privacy away from the media cameras, as well as teleconferencing and presentation capabilities. “That’s where we work out any emergencies, be it a weather emergency, a traffic emergency or a homeland security emergency, if it should come to that,” Cortez said. “The only [major emergencies] we’ve had to use it for recently are weather events: ice storms and hurricanes. During the hurricane, we coordinated traffic coming up from the Houston area.”

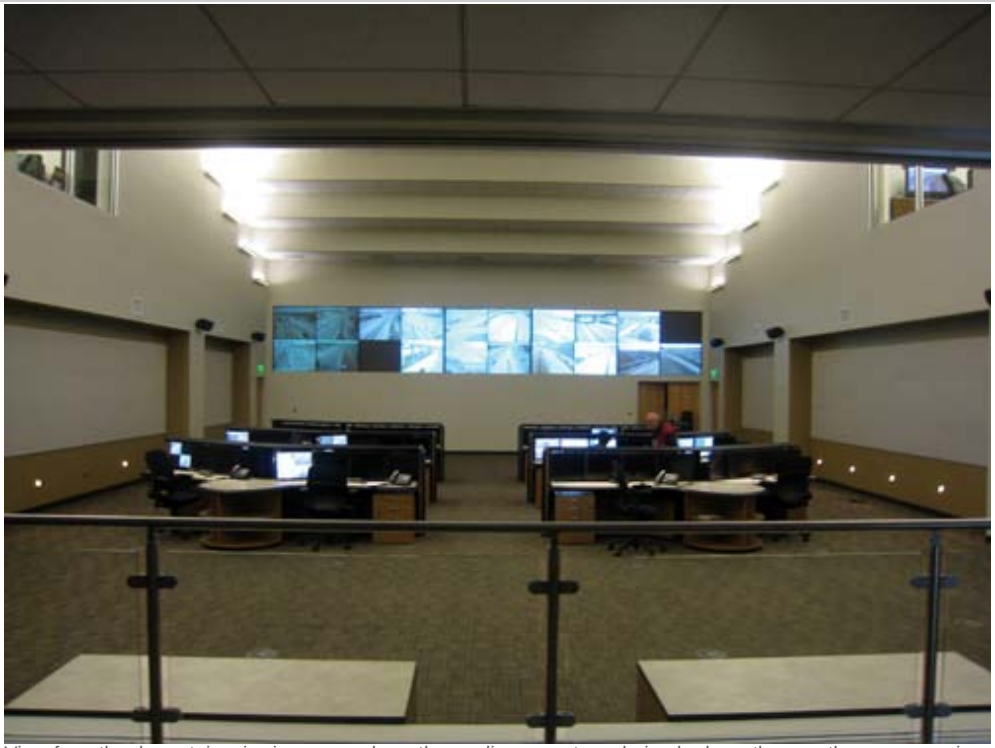
NASA-Type Facility

Cortez described the EOC as “something you might see at NASA.” Twelve monitoring stations on the floor are used by TxDOT, DART and Dallas County personnel. The stations contain multiple 21-inch LCD flat-panel monitors by ViewSonic in Evans consoles. The LCDs were specified by Telvent as a cost-effective selection that would not experience burn-in over time, because many of the images displayed on the screen would be mostly static.

An entire wall of the EOC is covered by a videowall composed of five 6'x8' (120-inch diagonal) Draper Diamond screens. The screens receive images from five Panasonic PTD5700U 5000 lumen, rear-screen LCD projectors. The space was available behind the videowall to install the more cost-effective rear-projection systems, according to Ott. “The LCD projectors were feature-rich, with the lamp life the client was looking for, at an attractive price point,” she said. The Diamond screen also offered higher gain than other options.

“The client’s goal was to have a good, bright image on the screen with the ability to switch easily between sources, view four images on the screen at once, or zoom in and view any single source as a full-screen image across the entire wall,” Ott said.

Fifteen RGB Spectrum 4View multi-image display processors and an IP-addressable AMX NI4100 NetLinx control system with touchpanels give the operators complete flexibility over the images they view. “We didn’t use RS232 commands,” Ott said. “Everything is done over IP, so they can log in to a regular computer to control audio and video.”



View from the downstairs viewing room where the media can set up during bad weather or other emergencies, and view the Emergency Operations Center.

Images At Any Size

The 4View processors permit operators to views images at any size, anywhere on the screens, with colored borders and labels to assist in image delineation. The processors display all four video inputs at full resolution, up to 1600x1200 pixels, with advanced, artifact-free motion rendering for high visual quality.

“The multi-image display wall has become an invaluable monitoring tool, enabling operators to maintain comprehensive vigilance and improve safety and security,” Ott noted in the case study.

The 4View processors support composite, S-video and component video inputs. The systems receive feeds from 200 remote surveillance CCTV cameras located on Dallas-area highways, as well as local television broadcasts, DirecTV broadcasts or a DVD player. “They can bring up CNN and other news stations on the big screen,” Ott said. “It allows them to draw from every source to be able to divert traffic in the event of an emergency.”

The company installed both analog and digital antennae on the roof in order to be prepared for the shift to digital broadcast. Analog tuners were supplied but TxDOT is prepared, with money available in the budget and infrastructure in place, to install digital tuners. “We didn’t paint them into a corner,” Ott said. “We left them with options.”

The EOC’s audio includes six Klipsch CA-650T 60-watt wall-mounted speakers powered by Crown amps. The system, which also features an Extron 12x8 audio matrix switcher, is controlled through the AMX.

Viewing Room

The viewing room might be considered TxDOT’s outgoing connection to the outside world. A large media panel with video and XLR connectors permits staff from the various new stations to receive a direct feed from inside the EOC. “The news crews plug into the wall and 350 feet of conduit and cabling leads into the parking lot area where the news crew vans park, with their satellites on top to transmit the live feed,” Ott explained. The viewing room also includes two 42-inch Mitsubishi LCD displays connected to 4View processors.

The large, divisible training room on the first floor has extensive AV systems of its own, controlled through an AMX VPX-CPNW wireless system. Projection systems include an NEC 2100 lumen VT-676 XGA LCD projector and a 100-inch diagonal Da-Lite Electrol screen.

Eight KSI ceiling speakers were installed for reinforced sound. Ott noted that the glass windows in the training room created some acoustical challenges with echoes and reverberation, “but not many, because they did such a good job on the front-end with the engineering,” she said.

All sound and video is routed through an Extron six-input Media-Link switcher and stereo amplifier. Dual WolfVision Visual Presenters and a rear-projection SMART Board 3000i give speakers all the presentation capabilities they might need. The SMART Board is a standalone unit with an

integrated high-resolution projector and a control panel button that permits operators to switch inputs from the internal computer to a laptop or other multimedia device. The Digital Vision Touch (DViT) technology lets presenters use their finger as a mouse or write in digital ink on the screen using the included pen and eraser.

The systems in the Emergency Management Room are similar to those in the training room, with the same projector and screen, five KSI 2x2 ceiling speakers powered by the Extron amplifier and six-input MediaLink switcher. The SMART Board in the room is a 72-inch SB-580, which receives images from the projector or inputs from a laptop.

Lobby AV

The lobby uses two 40-inch Mitsubishi MLM400 LCD monitors with CCTV, receiving inputs from the traffic cameras or the local news. The lobby systems, with Mitsubishi MLM-SPKR speakers, are controlled by an Extron MLC. The monitors can also receive a feed from an LG DVD player or VCR, so TxDOT can broadcast a pre-produced program to greet visitors to the facility.

Ott noted that the project, which took seven years to complete from the day ground was broken until the facility opened, presented some typical challenges, such as timing issues with all the trades involved and a limited budget.

Originally, the client desired a wall in the EOC composed of video cubes, but this turned out to be cost-prohibitive. Video cubes would have cost $15,000 each, with 16 cubes required to cover the wall. “It would have cost almost half a million dollars,” Ott said. “With the Diamond screen and the projector, that aspect only cost $150,000.” The infrastructure is in place so the client can upgrade to video cubes in the future if funds become available.

With concerns about spending taxpayers’ dollars well, the budget was watched carefully. “Locally, this project was highly publicized,” Ott noted. “They actually came in under budget.”

The EOC appears on the local news channels regularly, and the city relies on the EOC to relay important news regarding traffic and weather, so it was particularly important to CCS that the systems had no down time.

TxDOT retained CCS on a service contract, so the installer visits on a regular basis for routine maintenance. “We wanted to keep an eye on the project,” Ott offered. “It was really important to us to make sure it was always up and running.”

The ongoing service contract has also enabled Ott to experience the fruits of her labor firsthand. “Sometimes, I’d be heading out there and I’d call and say, ‘I’m going to be late.’ But they’d already know. They knew exactly where the traffic was and they’d tell me, ‘Once you get past mile marker so-and-so, you’ll be OK’.”

She continued, “What amazes me is how quickly they can respond to things now. They spot a problem and they get on the radio, dispatching people to solve the problem. It used to take a lot more time and they needed more operators to monitor the screens. Now they can spend more time out on the field fixing the problems.”

CCS Presentation Systems, Inc.

CCS Presentation Systems, Inc., has 25 offices in 11 states across the US. The full-service AV and control integrator and installer has been serving customers in the corporate, government and educational sectors for nearly 20 years. In that time, CCS expanded from a two-person operation to a $100 million company with more than 300 employees.

Recent projects include the installation of rear-screen projection and integrated videoconferencing in the executive conference room at the Naval Hospital in Camp Pendleton near San Diego CA, and the design and installation of AV systems, including a one-ton pentagonal plasma video display system, in the new Service Group of America (SGA) Corporate Center’s high-end conference room, located in Kierland AZ, just outside of Scottsdale. Other clients include Strong Rock Christian School in Locust Grove GA, the Phoenix (AZ) Elementary School District and the Arizona Law Enforcement Academy.

In 2008, CCS received an ACE (Arizona Corporate Excellence) Award.
The integrator recently introduced initiatives to emphasize green solutions for its clients, while developing user-friendly recycling programs and establishing standards to reduce the company’s environmental footprint in all its offices. The company’s recent TxDOT installation project, designed to reduce traffic congestion without building new roadways, exemplifies this commitment to environmental awareness and sustainability.

For additional information, go to www.ccspresentationsystems.com.

Equipment

Emergency Operations Center

1 AMX NI-4100 NetLinx integrated controller w/ICSNet
1 AMX PSN6.5 13.5VDC, 6.5A power supply
1 AMX NXT-CV10 10" Modero tabletop touchpanel
5 Chief RPA-U projector mounting plates
2 Contemporary Research 232-STA stereo TV tuners
1 Contemporary Research RK2 surface mounting bracket
1 Crown CTs 600 amp
1 DirecTV DBS18x24D satellite dish
6 DirecTV D11 receivers
5 Draper Diamond videowall screens w/frame
12 Evans Identity 72"-wide consoles
1 Extron MAV Plus 128 A 12x8 matrix switcher
w/IP link for stereo audio
6 Klipsch CA-650T 60W surface-mount speakers
1 LG XBV-613 DVD/VCR combo
4 Middle Atlantic KDB14 slotted rack shelves
6 Panasonic PT-D5600UL 5000 lumen digital projectors
1 Panduit DP48688TGY 48-port patch panel
15 RGB Spectrum 4ViewXL color quads
1 Spaun MS512 multiswitch
4 Spaun SVF20LE 20dB line amps
6 Spaun SEW121F diplexers
48 ViewSonic VP2130B 21" LCD flat-panel monitors
1 Winegard SS2000 TV antenna

Viewing Room

1 Extron 6-input MediaLink switcher
8 KSI ceiling speakers
1 LG XBV-613 DVD/VCR combo
2 Mitsubishi MDT402S 40" LCD monitors
1 Mitsubishi SPKRSFL40 LCD monitor speaker
2 Peerless PLA60UNLP articulating wall arm mounts
1 SMART Technologies SMART Board 3000i hi-res projector
2 WolfVision Visual Presenters

Lobby LCD Monitors

1 LG XBV-613 DVD/VCR combo
2 Peerless PLA-60 articulating wall arm mounts
w/adapter plates
2 Samsung LN-S5797D 57" LCD monitors

EMS Conference Room (2nd Floor)

1 AMX NXD-CV5 5" Modero wall/flush mount touchpanel
1 AMX NI-2100 NetLinx integrated controller w/ICSNet
1 Chief RPA-U projector mounting plate
1 Chief CMA-440 ceiling plate
1 Crown D-75A amp
1 D-Link DI-804HV 4-port broadband router
1 Draper Access V tab-tensioned 100" diagonal screen
w/low-voltage control
1 Euro Design multimedia lectern
Extron 6', 12' VGAs w/audio cable
1 Extron WP150 VGA w/audio wall plate
1 Extron CrossPoint 8x4 matrix switcher w/audio
4 KSI 6061-CS 2x2 grid ceiling-mount speakers w/grilles
1 LG XBV-613 DVD/VCR combo

1 NEC VT695 2500 lumen, XGA LCD projector
NEC serial cable
1 PolyVision IP 17 interactive panel
1 WolfVision VZ-8light visual presenter

Training Room (1st Floor)
2 AMX NXD-CV5 5" Modero wall/flush mount touchpanels
1 AMX NI-2100 NetLinx integrated controller w/ICSNet
2 Chief RPA-U projector mounting plates
2 Chief CMA-440 ceiling plates
2 Crown D-75A amps
1 D-Link DI-808HV 8-port broadband router
2 Draper Access V tab-tensioned 100" diagonal screens
w/low-voltage controls
2 Euro Design multimedia lecterns
2 Extron 6', 12' VGAs w/audio cable
2 Extron WP150 VGA w/audio wall plate (black)
1 Extron CrossPoint 16x8 matrix switcher w/audio
8 KSI 6061-CS 2x2 grid ceiling-mount speakers w/grilles
2 LG XBV-613 DVD/VCR combos
1 Middle Atlantic ERK-2725 25" depth, 47½" (27-space) rack
2 NEC VT695 2500 lumen, XGA LCD projectors
NEC serial cable
2 PolyVision IP 17 interactive panels
2 WolfVision VZ-8light visual presenters

List is edited from information supplied by Immersion Graphics Inc.