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Regional Transportation Commission of Southern Nevada upgrades their video wall with minimal downtime at significant cost savings – Mitsubishi LED Upgrade Engine key to the project

It's a big job, keeping traffic moving in all of southern Nevada, an area that includes the Las Vegas Valley, a 600 square-mile basin that's home to the three largest cities in the state.

The Regional Transportation Commission of Southern Nevada (RTC) has responded aggressively to the challenge, transforming itself into one of the nation's leaders in intelligent transportation systems, or ITS. Starting in 2004, they set up one of the nation's first truly integrated ITS organizations with FAST, their Freeway and Arterial System of Transportation.

According to Arvin Jordan, Technology Supervisor for RTC, FAST has automated all of the traffic signals on arterial roads in the Valley, centrally controlling more than 3,000 signals and adjusting them automatically as conditions change. In addition, they monitor traffic flow on all of the region's highways and arterials, using a system of pavement sensors, microwave sensors, Bluetooth® sensors and cameras to alert operators in their transportation center when there's a problem. They, in turn, may send out road crews, manually tweak signal timing and alert the public through a network of dynamic message signs as well as email, text messages, online maps and online images of the roadways.

FAST also sends camera feeds to local television stations and the Emergency Operations Center for Southern Nevada, part of the Nevada Highway Patrol Southern Command Headquarters, located in the same building.

"As a part of RTC, we're the bus company as well," Jordan adds. "We monitor busses, help keep them on time and let people know when the next bus is coming through our free smartphone apps."

HIgh tech traffic management

The control room at FAST is a large one, with up to 20 operators on duty at any given time. On the right side, up to ten dispatchers from the Nevada Highway Patrol take reports of accidents and other incidents forwarded by 911 or local police departments, as well as reacting to information from RTC's arterial traffic management system (ATMS) and freeway management system (FMS). "Say there's an accident on Interstate 15," explains Lee Pagnan, Western Regional Manager for Mitsubishi's Display Wall division. "They'll send a trooper or call the fire department, get a tow truck out to the scene – take whatever steps are necessary to help the victims and to get traffic moving again."

On the left side is traffic management operations, with up to ten operators responsible for the ATMS, the FMS, the dynamic message signs, alerts that go to the media as well as the website, and the timing of the traffic signals. While many of these functions are computerized, these operators will monitor the automated systems and tweak settings

as appropriate, for example turning signals green as an accident is cleared to help relieve congestion.

The room is served by a 10' high by 30' wide video wall originally consisting of 36 Mitsubishi XGA projection cubes in a 9 x 4 configuration. "The operators can put anything they want on the wall," Jordan explains, "including camera feeds, maps from our ATMS, feeds from the local news or the Internet, weather maps – anything they may need to share with each other at a given time."

That being said, images on the video wall most often will come from RTC's network of more than 600 cameras, which allow traffic management operators and dispatchers to pull up live views of most incidents. "We are proactive as much as we are reactive," Jordan adds. "Say there's a car stalled on one of the highways. We can monitor it and see how it affects the traffic flow. If we have a report of a drunken driver, we can pull him up on the wall, note what he's doing and relay that to the police. If there's a special event on the Strip, we will bring up cameras showing traffic on 15 and Las Vegas Boulevard and just keep an eye on what's going on."

Upgrading the video wall

The video wall at the FAST traffic management center was originally installed in 2005 using lamp-based Mitsubishi projection cubes, the best technology available at that time. About two years ago, Jordan and his team began considering their options to replace these cubes. "Our existing units had reached end of life. While Mitsubishi continued to provide support and spare parts, the cost of maintaining the old technology was becoming increasingly expensive," Jordan says.

The biggest issue for FAST was the cost of consumables, such as the UHP lamp, color wheel, and filters used by the aging cubes. Due to the control room's 24/7/365 operations, lamps had to be replaced every six months, color wheels every three years, and filters once a year. The parts, labor and downtime for maintenance really added up. "Power consumption was a factor as well," Jordan adds. "Ten years ago, we had a special cooling system installed behind the video wall for the projection cubes. Yet we knew that with LED technology we would be able to do without that system and save significantly on our utility costs and carbon footprint." Jordan began discussions with technology integrator AVI-SPL and Mitsubishi to upgrade the system.

"We do our best to keep in contact with all of our end users," Pagnan says. "We try to ensure that their video wall is performing as expected, and we let them know how technology is changing and what is on Mitsubishi's product road map. The release of the Mitsubishi LED upgrade in 2014 was one of those 'perfect timing' scenarios for RTC/FAST. We were able to provide an onsite demonstration, product specifications, and budgetary numbers for the agency to get funding approval for this project."

The new upgrade engine includes an LED light source, redesigned DLP projection elements, and a redesigned cooling system, all using the latest technology. It can offer over 11 years of maintenance-free service when used 24/7/365, plus brighter images, better color, lower power consumption, much lower heat dissipation, and less deterioration of image quality over time compared to the prior UHP lamp technology. Since the LED upgrade engine reuses the cabinets and screens from the old video wall, it avoids the expense and downtime of disassembling the old video wall and rebuilding a new wall from scratch.

"Mitsubishi has always built a very high quality, low-failure projection cube," says Art Paquet, Design/Sales Engineer for AVI-SPL. "They

do a lot of engineering and a lot of testing before they release a new product, so we know when it is available, it will be solid. It was a natural upgrade path to use the new engine at RTC."

"The installation was a really easy process for everyone involved," Pagnan adds. "We worked with RTC/FAST to schedule the installation during off-peak hours. Our technicians simply opened each cube, slid out the old DLP optical engine, slid in the new LED engine and connected it. Just one cube would go dark at a time. As they finished upgrading each projection cube, our technicians went on to the next, ensuring that the was minimal disruption to operations."

Because FAST uses rear-access projection cubes, the AVI-SPL technicians didn't even have to put ladders or scaffolding in front of the video wall. For most of the process, there was no need to shut down operations, as 35 of the 36 screens continued to work throughout.

In addition to upgrading the main video wall, AVI-SPL installed 12 Mitsubishi 55" super narrow-bezel LED displays in 2 x 3 configurations on either side of the main wall. "That was just to add more viewing space," Jordan explains. "We've gone from 200 to 600 cameras over the last few years, so it helps to be able to put a few more images up in the control room."

AVI-SPL technicians also replaced the video wall processor with a new, much faster Jupiter Fusion Catalyst™ 8000. "One reason we picked the Jupiter is that it was backwards-compatible with our software," Jordan says. RTC/FAST continues to use Kimley-Horn ITS and freeway management applications to control their cameras, ramp meters, dynamic message signs and other technology.

"The installation went really well," he adds. AVI-SPL did need to take over the video wall while they calibrated and color balanced the new LED engines, but "We picked a really slow weekend with no holiday traffic and no special events, and it went smoothly."

The entire upgrade installation took just over two weeks, with about five days devoted to switching out the light engines in the video wall. Pagnan estimates that RTC/FAST saved at least 25% on hardware costs, 60% on labor, and more than 80% on downtime, compared to installing a brand new wall. Jordan expects less than a five-year payback on the upgrade, calculating the ROI of the new LED engines versus the cost of replacement lamps and color wheels. "That's not including the fact that we no longer need to run the special air conditioning system, nor the power savings on the video wall itself."

Now the agency can do their job even better – keeping traffic moving day and night without worrying about downtime due to maintenance of the video wall.