

# Backbone carries digital signal

Television station installs a single-mode fiber solution to accommodate new broadcast technology.

**M**igrating from an analog to digital television infrastructure has, in recent years, led to some unexpected—and major—headaches for broadcasters and their engineering staffs. This was a situation that TVW, the Washington state public affairs television network, recently faced.

TVW provides gavel-to-gavel coverage of Washington state legislative sessions, Washington Supreme Court hearings and

other public affairs events. The network produces more than 2,000 hours of programming annually, modeling its coverage on the federal-level C-SPAN network by providing unbiased, unfiltered access to state government deliberations.

TVW has one of the largest robotic camera facilities in the nation, with 39 remotely operated cameras located in the legislative building, the Temple of

Justice, and the State House and Senate office buildings in Olympia, the state capital.

When TVW moved into its new broadcast center, the Jeannette C. Hayner Media Center, it needed to make a major overhaul of the network's equipment, from outdated analog equipment to state-of-the-art digital broadcast technology. Up until the move and the transition to digital video technology, the four buildings on the Capitol campus were connected to TVW's broadcast facilities by a network backbone approximately a mile in length. The traffic on the backbone typically

includes four SDI video feeds multiplexed into a single channel, 12 audio channels and control channels for the robotic camera systems on the campus.

According to Marc Gerchak, TVW director of engineering, this backbone used a legacy multimode fiber technology that was adequate for the previous analog platform. Its performance with the media center's digital platform, however, was not acceptable.

"The video signal would actually just break up and not make it back to TVW on a lot of the lines," Gerchak says. "We determined that the multimode wasn't able to accommodate the signals without reflective effects disrupting the signal."

After analyzing the problem and isolating it to the multimode limitations, Gerchak worked with TVW's networking infrastructure contractor, Intracommunication Network Systems (INSI), to develop a new solution. INSI project manager Ari Shackell realized that TVW needed a single-mode backbone fiber solution that could be designed, tested and installed swiftly and cost-effectively.

## DECISION CONSIDERATIONS

The solution chosen was Corning Cable Systems' Plug & Play AnyLAN Systems. Several conditions helped decide in favor of using Corning's solution for the new backbone:

- ▶ Existing pathways through steam tunnels and other utility conduits had limited space and difficult access for cable pulling and splicing.
- ▶ TVW needed a flexible system that could be quickly installed in a short time frame, with minimal disruption of the Capitol campus, a high-security area.
- ▶ Its availability in singlemode fiber, which provided the signal stability necessary for multiplexed digital video transport.

"We had to obtain permissions from multiple state agencies from a security perspective to gain access to those tunnels," Gerchak says.



When TVW moved into its new broadcast center, the Jeannette C. Hayner Media Center, it needed to make a major overhaul of the network's equipment, from outdated analog equipment to state-of-the-art digital broadcast technology. Photograph by Kristin K. Zwiers.

AnyLAN Systems is a preterminated local area network cabling solution that can be installed up to 50 percent faster per splice or termination point than traditional field installations. Available in singlemode and 50  $\mu$ m multimode fiber, AnyLAN Systems incorporates standard optical-fiber cables that feature pre-installed tether attachment points (TAPs) placed along the length of the cable at customer-specified points. These preterminated TAPs replace standard bulky, manually installed splice closures and the need to midspan access and splice the backbone cable to drop to locations.

Factory-terminated and -tested distribution trunk cables, tethers and harnesses enable quick, reliable installation, and each TAP supports up to two tethers (24 fibers) per location for added flexibility. Harnesses are terminated with the OptiTip MT Connector on one end and up to 12 single-fiber connectors on the other end.

The main trunk is a 144-fiber AnyLAN Systems distribution cable, approximately 3,000 feet in length, running from the main distribution frame at the media center to a distribution point on the Capitol campus. From this point, multiple 12-fiber tethers of various lengths connect the backbone trunk to each of the four buildings in the network: four 12-fiber tether assemblies to the legislative building, two to the Temple of Justice and two each to the Senate and House office buildings. In addition, a new tether was connected to the general administration building to support future video feeds planned for that location.

The backbone trunk interfaces with the media center's main distribution frame using Corning Cable Systems' Pretium Connector Housing. Designed for LAN and data center applications, they provide convenient, open access to connectors for moves, adds and changes.

### MODULARITY, SPEED IMPORTANT

According to Gerchak, the principal appeal of the Corning solution was the speed with which TVW's network could be manufactured and installed, coupled with the

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on the site of an existing general administration building, which will be demolished," Gerchak adds. This facility is expected to host activities that TVW will need to cover, so the new fiber infrastructure will make adding the site to the TVW network easier to accomplish.

To help confirm that the AnyLAN Systems single-mode solution would correct TVW's video issues, Corning Cable Systems provided a simulator platform so TVW could test the product's ability to fully support the network. TVW ran a week-long test sending the SDI video signal through this platform and was satisfied the solution was stable and delivered the required signal quality.

TVW faced two major challenges with installing the new network. First, a new conduit needed to be run underground from TVW to the tether drop point on campus. This path had to be bored under the main lawn of the Capitol, requiring further rounds of permissions from multiple agencies. Once the permissions were obtained and the conduit installed, Corning and INSI were able to complete the upgrade quickly.

Since the AnyLAN System has pre-installed tether attachment points, technicians did not need to spend hours in steam tunnels splicing and testing connections, installing splice enclosures and other time-consuming tasks. For example, the main cable pull—close to 3,000 feet—from the campus to the media center, was accomplished in one afternoon.

Since the new backbone was installed, TVW has had no video signal issues that could be attributed to the Corning system or the single-mode fiber, with stable digital video coming from the campus to the media center. □

system's modular ability to handle future growth.

"In case I had any changes on the Capitol campus, or a new building needed to be added to the network, I knew all I had to do was purchase a harness to plug into the backbone infrastructure," Gerchak says.

"There are already plans in place by the state to build a new Heritage Center

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