Dos Palos-Oro Loma School District Bridges Homework Gap

A two-phase deployment of 4G fixed-wireless access technology will provide broadband internet connectivity to help underserved students in California's rural Dos Palos-Oro Loma Joint Unified School District conduct remote learning.

By Sean Buckley / *Broadband Communities*

Located in the heart of the San Joaquin Valley near the geographic center of California, Dos Palos is halfway between San Jose and Fresno. It's a remote community, which created challenges for the Dos Palos-Oro Loma Joint Unified School District (DPOL) when it needed to implement distance learning plans during the pandemic.

Paoze Lee, the district's technology systems director, said it was obvious that the district could provide wireless and broadband coverage only to about 50 percent of its students via commercial wireless operators. "As we tried to bridge the digital divide, we wanted to fill in the gaps," Lee says. "One of those gaps is Wi-Fi connectivity at home."


Paoze Lee

DPOL is working with Nokia and AggreGateway to build a private wireless network so every student can access its learning facilities. The first phase of the build is complete, and Lee says the school district "is nearly done making sure all of our students have access to devices connected to the internet at home."

CHALLENGING BROADBAND SITUATION

Like other remote communities with low-income families, a key challenge for DPOL students is the lack of affordable broadband options. Today, nine out of 10 kids in the school district qualify for free or reduced lunch. Lee says the district's students "are underserved in terms of getting internet access."

In the region where DPOL students live, broadband options are limited. The areas the school district serves are small, agricultural communities. "Even though we're in 2022, there's a huge gap in fiber and cabling infrastructure," Lee says. "All of these small school districts want to ensure that students can do their homework once they leave the school grounds."

THE COVID-19 EFFECT

As the COVID-19 pandemic hit, DPOL was able to get better visibility into its students' broadband situation. "COVID-19 allowed us to see how impactful broadband access was," Lee says.

DPOL's situation is similar to school districts in Ducor, Kennedy Meadows and Rancho Tehama, three rural, sparsely populated California communities. Rural telco Varcomm is helping economically challenged students in these districts access low-cost broadband.

Varcomm, knowing it would quickly run out of routers, turned to its technology partner, Core Technologies. As Varcomm started sending out routers, Core Technologies reached out to ADTRAN, which donated 100 modems.

Lee and his team realized that they needed to find a way to make sure students could access the internet at home. "When we first did this, my conversation with the school board was that this COVID-19 thing won't be going away," Lee says. "We needed to make sure our students were ready, and as a district, we needed to be ready to make sure all of our students have what they need at home."

When the federal government introduced the first round of emergency federal stimulus funding during the pandemic, the school district wanted to learn how to leverage it.

FOCUS ON LOCAL PARTNERSHIPS

The school district found the right partnership in AggreGateway, a network engineering and integration firm, and Nokia. AggreGateway serves as the prime contractor, and Nokia is the subcontractor for the project. DPOL leveraged CARES Act and other funding sources to make the project happen.

Matt Young, vice president of North American sales at Nokia, says the company seeks integrators to conduct network builds as it works with more school districts. "There's a lot of activity with school districts around the country," he says. "Anytime we have an opportunity, we try to bring in a local partner to provide support, design and integration, so we're trying to serve this market through partners."


Matt Young

Young adds that because networks such as DPOL's are private, the projects are more complex than using a Wi-Fi network. "It takes a bit more technical understanding for these partners," he says. "There are hundreds of partners that do Wi-Fi all day long, but in this case, AggreGateway brings more technical detail."

TWO-PHASE DEPLOYMENT

The two-phase deployment will serve the distance learning needs of 2,400 students. Upon completion, the wireless network will provide internet access to the homes of students using the Nokia Private 4.9G/LTE Digital Automation Cloud (NDAC) operating in the Citizens Broadband Radio Service (CBRS)/On-Go GAA spectrum and customer premises equipment, including Nokia FastMile 4G Gateways and Wi-Fi Beacons.

AggreGateway equipped existing wireless towers with radio heads during the project's first phase. This took care of the southern and eastern parts of the rural town.

In the second phase, the plan is to erect another cell tower at one of the school sites. "Once these builds are completed, the whole town, or roughly 1.5 square miles, should have wireless access," Lee says.

Students will access free wireless service through the local cell towers – the service backhauls into the school district's network and filters through its network firewall. "The network includes a safety component that ensures all web traffic goes through [the district's] web filter and firewall," Lee says.

PRIVATE NETWORK MOMENTUM

Nokia is seeing ongoing activity with private LTE/5G wireless networks. The COVID-19 pandemic drove increased activity in school districts.

As CBRS wireless spectrum has become available, school districts

FCC TACKLES THE HOMEWORK GAP

If the COVID-19 pandemic highlighted anything, it's that there's a significant disparity between people who have and do not have broadband. This became a significant problem for school-age children as schools closed and distance learning became commonplace.

According to the FCC, nearly 17 million school-age children in the U.S. can't access internet in their households, creating what Chairwoman Jessica Rosenworcel coined the "homework gap." If the homework gap remains, it becomes an opportunity gap because of the lack of available and affordable broadband.

The FCC created three significant programs to address the problem: the Emergency Broadband Benefit (EBB), the Affordable Connectivity Program (ACP) and the Emergency Connectivity Fund. The $3.2 billion EBB program addresses broadband affordability. It provides a discount of up to $50 per month toward broadband service for eligible households and $75 per month for families on qualifying tribal lands. In addition, eligible households receive a one-time discount of up to $100 to purchase a laptop, desktop computer or tablet from participating providers if they contribute more than $10 and less than $50 toward the purchase price.

In December 2021, the FCC launched the ACP as a successor to the EBB program to address broadband affordability. The program provides a discount of up to $30 per month toward internet service for eligible households and $75 per month for families on qualifying tribal lands.

Finally, the $7.17 billion Emergency Connectivity Fund helps schools and libraries close the homework gap by providing funding for the reasonable costs of laptop and tablet computers; Wi-Fi hot spots; modems; routers; and broadband connectivity purchases for off-campus use by students, school staff and library patrons in need during the COVID-19 pandemic.

can leverage a "do-it-yourself" Nokia cloud-based system. "Nokia's platform is a service, edge-network solution that attaches to small cells that allow secure and reliable connectivity," Young says.

Another benefit is that maintaining the network and services doesn't require a large staff. "Because a school district may not have the IT department a traditional cellular provider does, it doesn't need the staff to support it," Young says.

DPOL is just one of several districts in which Nokia is deploying these types of networks. The company has launched similar networks in Illinois and Texas.

In Illinois, Collinsville Community Unit School District 10 launched a private LTE network to bring internet connectivity to approximately 500 students in the Fairmont City and State Park communities. The school district partnered with IT solution provider STEPcg to construct a private wireless network based on Nokia's LTE technology. Similarly, in Bexar County, Texas, the Southwest Research Institute (SwRI) and Wytec International are building a private LTE network with Nokia as their technology partner.

Nokia created a similar partnership in DigitalC to provide internet access to thousands of underserved homes in Cleveland.

"We're talking to many school districts about similar network deployments," Young says. He adds that what's interesting about the technology and its products is that it can be used by large businesses that want to build private wireless networks.

"The same fixed-wireless technology we're deploying to serve students can be used for enterprises," Young says. ❖

AggreGateway equipped existing wireless towers with radio heads during the project's first phase.

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PRIVATE WIRELESS LTE/5G NETWORKS SEE HEIGHTENED DEMAND

As enterprises look to gain the benefits of an LTE/5G wireless network for their separate use from the public wireless network, private LTE/5G wireless networks continue to gain momentum worldwide.

A recent IDC report forecast that private LTE/5G wireless infrastructure revenues will reach $8.3 billion by 2026, a significant increase from $1.7 billion in 2021. The research firm said the market will achieve a five-year compound annual growth rate of 35.7 percent over the 2022–2026 forecast period.

What is a private wireless network? IDC defines private LTE/5G wireless infrastructure as any 3GPP-based cellular network deployed for a specific enterprise/industry vertical customer, such as a school district that provides dedicated access to remote resources.

These resources may include true spectrum, dedicated hardware and software infrastructure. A private entity can then support a range of use cases spanning fixed-wireless access, traditional and enhanced mobile broadband, IoT endpoints/sensors and low-latency applications.

"Heightened demand for dedicated or private wireless solutions that can offer enhanced security, performance and reliability continue to come to the fore as both current and future applications, particularly those in the industrial sector, require more from their network and edge infrastructure," said Patrick Filkins, research manager of IoT and telecom network infrastructure at IDC, in a release.

As 5G evolves, he says, "many organizations are expected to invest in private 5G over the coming years as advances [are made] in 5G standards, general spectrum availability and device readiness."