



Aging Infrastructure, New Technologies and Shrinking Budgets

Every year, schools across the United States are being asked to do more with less. Numbers from the Center on Budget and Policy Priorities estimate that about 30 states are facing a nearly \$50 billion shortfall, much of which will directly impact services in the public school system. Many of these same school districts face huge increases in heating costs, fuel for buses and health care costs for employees, while being forced to manage with budget reductions – some topping 20 percent or more.

This leaves school boards with the daunting task of allocating increasingly limited resources across a vast array of existing and new demands. As technology advances, tools and services used by students and teachers are becoming more complex and more network dependant. Applications such as VoIP, video and distance learning are increasingly in demand in schools at all levels, from K-12. The challenge faced by most school districts remains the same: finding a cost-effective and reliable network that carries enough bandwidth to deliver present applications, while leaving room for future applications and additional students, teachers and schools.

Common Needs, Unique Solutions

The needs of each school district vary by location and specific program. However, most of the basic network requirements, service delivery and technical needs are common to all K-12 schools. The networks deployed in these districts need to provide secure, carrier-grade reliability and maintain this level of reliability when located in challenging, physical environments. In order for the network to support high-bandwidth applications, like VoIP, video and distance learning, it must function optimally and above all, be cost-effective and scalable.

Motorola Put to the Test

One school district was faced with the challenge of delivering new and innovative network-centered programs for students, while keeping within strict budget guidelines. The school system desperately needed to upgrade their existing telecommunications system, in order to support a new Internet-based program and a distance learning initiative. They needed more speed and bandwidth.

On top of budgetary challenges, geographic hurdles for the schools in the district posed a unique challenge, as the district covers a vast geographic area and has numerous natural and man-made obstructions, including buildings, trees, mountains, extreme temperatures, freezing rain, snow, ice and wind.

Making the Grade

Motorola kicked off the project with an exhaustive site survey of the school district, including some 33 different schools and facilities (K-12) requiring connectivity. Many of the schools existed in areas with trees, buildings and mountains that created non-line-of-sight (NLoS) paths. A link estimator tool was used to conduct a path estimation, to determine if the connections were going to enable the system to meet the requirements for the bandwidth-heavy tasks.

New Economies, New Math

School districts across the United States and globally face a quandary that would stump even the smartest mathematician: how to deliver more services, more education initiatives and upgrade legacy communications technologies, while spending less money. Providing students access to the latest educational resources means necessary upgrades to existing telecommunications networks for most school districts. In one state alone, the governor has recently announced that nearly \$8 billion needs to be cut from health care and education over the next year.

Many Needs, One Solution

Fortunately for schools across the country, Motorola has developed a series of solutions, which can be customized for each district to address the common needs of educational networks:

- Secure, carrier-level network reliability
- High-bandwidth networks capable of supporting video, voice and data applications
- Cost-effective and scalable network infrastructure
- High-speed data rates with low latency
- Physical stability for harsh and challenging environments
- Fast time to deployment
- Quick and direct path to ROI

After discounting an expensive fiber loop, the school district decided to deploy a combination of Motorola's Point-to-Point (PTP) 400 and 600 Series radios in the 2.5, 5.4 and 5.8 GHz bands throughout the 33 schools. Both integrated and connectorized radios were deployed based on their respective locations and the degree of path obstructions for each connected site. The PTP 400 Series increased bandwidth establishing the next-generation wireless network the district needed to deliver present and future services, while the PTP 600 Series created redundancy.



Since deploying Motorola's solution, the school system enjoys the benefits of a fast, efficient, high bandwidth, wireless network.

Results

- Higher than expected data rates and bandwidth
- Network implementation completed ahead of time and under budget
- Saved an estimated \$1.7 million when compared to a traditional fiber network alternative
- The network is expected to pay for itself in less than two years
- PTP network is providing reliable and sustainable connectivity in all weather conditions
- The network delivers extremely low latency rates

About Motorola Wireless Broadband

Motorola's industry-leading portfolio of reliable and cost-effective wireless broadband solutions provide and extend coverage both indoors and outdoors. The Motorola Wireless Broadband portfolio offers high-speed connectivity systems that support data, voice and video communications, enabling a broad range of fixed and mobile applications for public and private networks. With Motorola's innovative software solutions, customers can design, deploy and manage broadband networks, maximizing up-time and reliability while lowering installation costs.



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