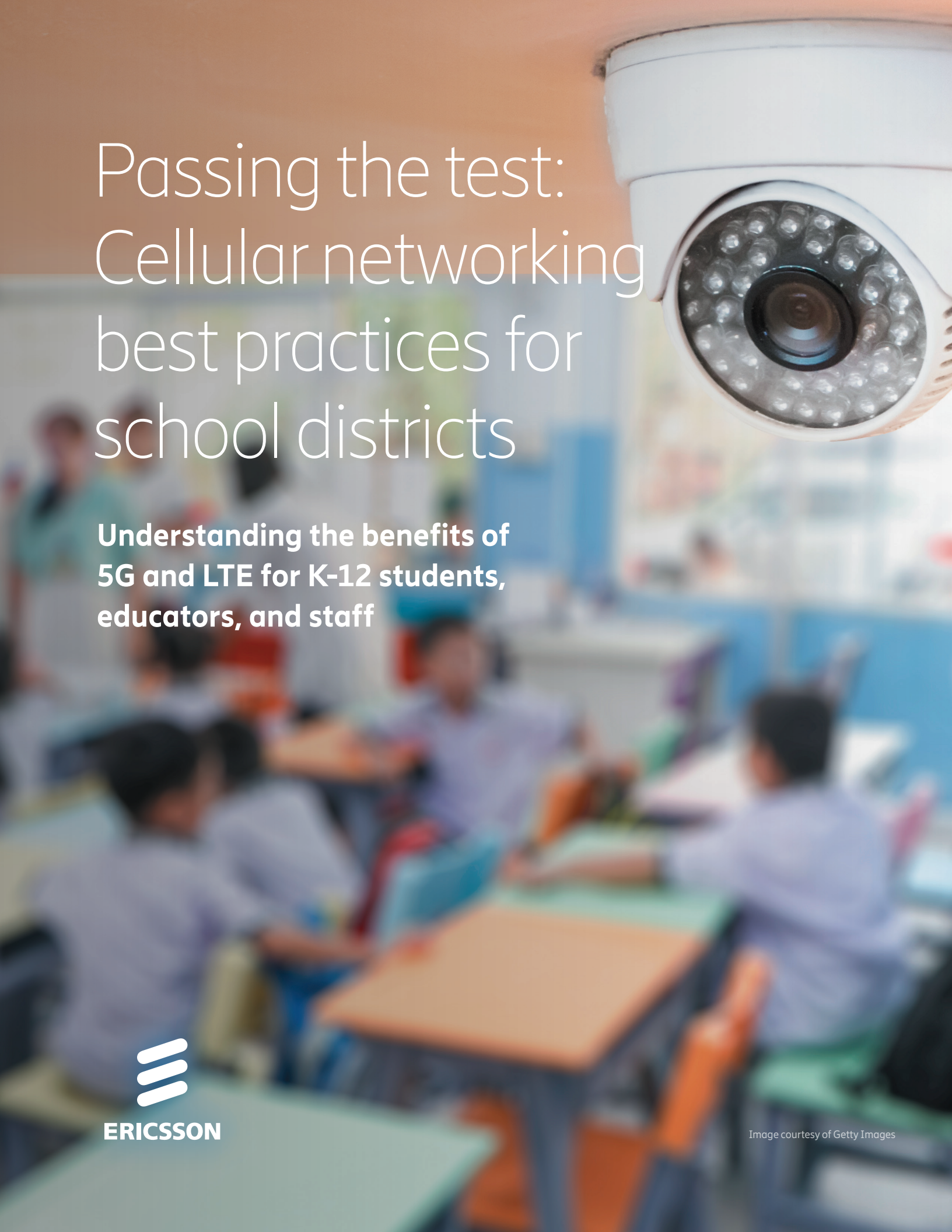
Passing the test: Cellular networking best practices for school districts

Understanding the benefits of 5G and LTE for K-12 students, educators, and staff



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Today's schools depend on secure, reliable connectivity

During the global pandemic millions of children were forced into remote learning environments. Many students had limited access to the internet and the IT resources essential to learning. While the adverse effects of this transition are still being studied, one thing is certain: the digital infrastructure of K-12 education needs to be improved. In many locations, these improvements rely on cellular WAN solutions that connect and protect students and staff.

Wireless WAN solutions address many of the unique challenges facing school districts. This e-book explores several of those situations, including:

Bus connectivity | Campus connectivity | Physical security | Cybersecurity

Digitally transformed schools need Wireless WAN

The digital transformation of K-12 education means connectivity is needed everywhere from classrooms to gymnasiums to buses and student homes. Wireless WAN supports the growth in application-based teaching, strengthens distance and hybrid learning, and improves school safety and operational efficiency. As learning trends evolve, public, private, charter, and tribal nations' schools and libraries are turning to 5G and LTE cellular connectivity to support their needs.

The intersection of educational needs and cellular benefits

Exceptional performance

Today's education applications, such as virtual classrooms, require high performance connectivity. Ample bandwidth and low latency are basic requirements, whether in urban or rural settings. High performance 5G and LTE networks are pervasive, making it easy to connect staff and students to the resources they need, wherever they are.

Immediate, flexible access

With 5G and LTE connectivity, network access is immediate. No more waiting for a technician to provide internet access for new locations. And it is just as easy to provide connectivity on the go to school buses or other mobile platforms.

Simplified network management

School districts are typically budget constrained and IT teams are spread thin. Managing multiple, widespread locations and bus fleets is a challenge. Cloud-delivered management platforms make it possible to centrally configure, manage, and troubleshoot networks.

Integrated security

Network security solutions need to support students, staff, and third parties, each with different needs and devices. State of the art zero trust cybersecurity architecture built into cellular WAN solutions gives kids of all ages secure access to the information they need while protecting data, devices, and applications.

Images courtesy of Getty Images

01

Bus connectivity

The average student spends 146 hours, equal to 24 school days per year, riding on a school bus. And for many students it's worse. Bus commutes can be as long as two hours one way. Instead of using that time to stare aimlessly out the window or watch TikTok videos, what if those hours could be spent completing an assignment or reviewing coursework?

> ⓘ Main challenge: Secure access to digital tools outside of the classroom

Benefits of 5G and LTE for bus connectivity

Student internet access

With ruggedized vehicle routers, school buses become rolling hotspots that provide secure access to educational resources beyond the classroom. Dual-modem routers fitted with SIM cards from multiple carriers ensure seamless failover as buses travel in and out of coverage areas, with uninterrupted connections for those on board.

Additionally, zero trust security controls protect users, devices, and data from web and email-based threats. Students' personal smartphones and tablets can securely access web and cloud-based applications.

Network mapping

Cloud-based dashboards monitor the location and status of systems on the buses. The system can also track coverage dead zones and carrier availability.

Image courtesy of Getty Images

02

Campus connectivity

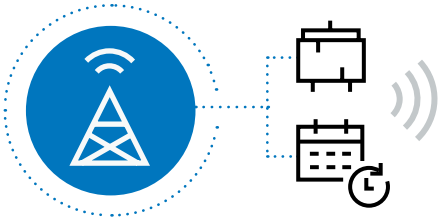
Increased enrollment and special events drive the addition of remote buildings and pop-up classrooms. Temporary and satellite locations need instant connectivity that is secure, easy to deploy, and that can be monitored and managed without sending IT professionals to each site.

Main challenge: Unavailable or unreliable wired connectivity

Benefits of 5G and LTE for campus connectivity

Day-1 connectivity with primary wireless

Installing new wired access points for every new popup classroom or remote site would be time consuming and expensive – and school districts can afford neither. 5G and LTE are plug-and-play solutions that enable same-day deployment using only a cellular connection. It's also simpler and more cost effective to rely on one or two cellular operators instead of a different ISP in each location.



Support for hybrid WAN

Cellular routers can be deployed in wireless and wired scenarios, creating an always-connected hybrid WAN solution backed by various WAN links. This provides network redundancy, load balancing, and improved network performance by leveraging different types of connections for different applications or locations.

Failover and Out-of-Band Management

Using a 5G or LTE router or adapter to back up a wired-only primary router provides cellular failover and wireless Out-of-Band Management. Traffic can be immediately directed to the wireless link when the primary wired link fails. Once the wired link is restored, traffic flow automatically returns to normal — in most cases, unnoticed by students and staff.

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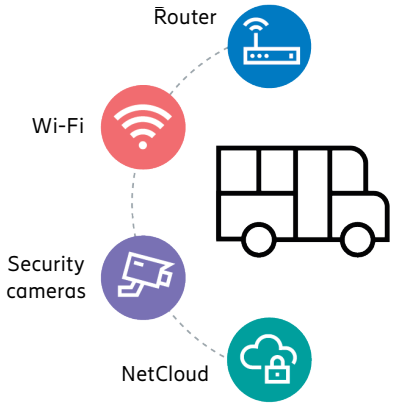
03 Physical security

Security, crime, and vandalism are major concerns in school communities. Buses provide a special security challenge as supervision is typically limited to the driver, who needs to focus on the road. Video surveillance and other physical security measures are a school district's best chance at capturing accurate accounts of behavior and events. Cameras in particular require precise placement and solid network performance to be effective.

> Main challenge: Securing locations without wired access

Benefits of connecting physical security with 5G or LTE

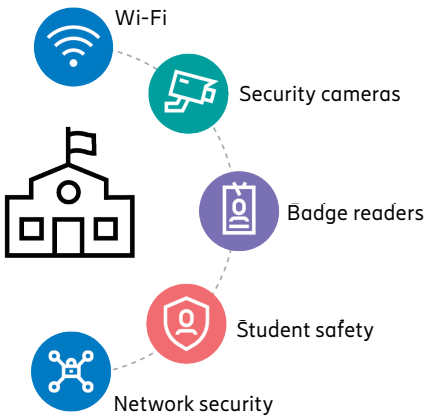


Video cameras on school buses

Video cameras deployed on buses and connected to a cellular WAN can be monitored in real-time to enhance driver and student safety and discourage mischief and vandalism. These cameras are also crucial in capturing evidence in case of an accident or student misbehavior. Camera footage can be offloaded using Wi-Fi-as-WAN at bus depots or schools. These safety measures protect students and improve driver retention.

On-campus security

Video monitoring throughout the campus can identify problems in real-time. The presence of video surveillance can itself be a deterrent to crime. Recording the video helps school districts hold perpetrators accountable when altercations or vandalism occurs. Video surveillance can also be used in litigation or insurance matters. Using 5G or LTE to connect cameras and other physical security devices, such as badge readers, allows school districts to install devices where they're needed without the limitations or costs of wires.



04

Cybersecurity

According to the Consortium for School Networking, K-12 technology leaders have ranked cybersecurity their No. 1 priority for five years. Phishing attacks, malware, denial of service, and even student hacks into digital grade books are common. School districts are often scrambling to restrict harmful content, police devices, and create and maintain access control of stationary and mobile networks.

Main challenge: Preventing network breaches and minimizing impact

Benefits of zero trust security architecture on 5G and LTE networks

Zero trust security

The old style of cybersecurity was similar to a castle with a moat. Firewalls and passwords guarded the gate. Once a user was "inside the castle" they were trusted. Zero trust takes a different approach. All traffic on the network is treated as if it is potentially malicious, offering a much higher level of security.

Content filtering

Identity-based policies managed in the cloud restrict user access to sites and applications based on their role. Students, different staff members or third parties may each have access to different IT resources based on what they need. Sites and downloads can be entirely blocked, blocked for specific groups of users, or filtered — all assisting in achieving CIPA (Children's Internet Protection Act) compliance without requiring any software installed on school or privately owned devices. In the event a user's credentials were compromised, the hacker only has access to whatever that user can access.

Isolation-based protection

An isolation-based secure web gateway (SWG) authenticates users and the group they belong to before filtering them to their appropriate destinations. The SWG acts as a virtual checkpoint between the user and the web — including generative AI sites — determining which traffic should be inspected, scrubbed, or isolated. Isolating selected applications in the cloud means the user is only working with a visual rendering of the application. No code runs on the user's machine. If a website or app were infected, there is no way for that infection to reach the user's device and network. Parents, contractors, and students can use their usual browsers (and own devices) to access educational and operational resources while keeping the network safe.

Image courtesy of Getty Images

School districts give Ericsson Enterprise Wireless Solutions an A+

Ericsson NetCloud Service, delivered through secure, purpose-built 5G and LTE routers and adapters, unlocks the power of cellular connectivity for K-12 environments. With scalable, flexible networks and data security among their highest priorities, schools can incorporate Wireless WAN technology and zero trust cybersecurity into their networks to give students the flexibility to learn from anywhere and empower educators to take on the future.

> "You can build on this solution; it's scalable. There are so many other possibilities and benefits that can come from the Ericsson connectivity."
>
> **Philip Neufeld,** executive director of information technology, Fresno Unified School District

About Ericsson Enterprise Wireless Solutions

Ericsson's enterprise wireless solutions enable organizations to innovate, operate, and grow anywhere — without constraints. Ericsson NetCloud, Cradlepoint routers, and Enterprise 5G solutions provide the flexibility of public and private 5G, with the zero trust security of simplified SASE.