

# K-12, 2013 AND BEYOND

**HOW MOTOROLA'S WIRELESS EDUCATION  
TECHNOLOGY SOLUTIONS ARE HELPING  
K-12 SCHOOLS AND DISTRICTS GET AHEAD  
OF THE FUTURE.**



# WHAT WILL K-12 EDUCATIONAL ENVIRONMENTS LOOK LIKE IN TWO YEARS? IN THREE YEARS? IN FIVE?

You don't need a crystal ball to answer those questions. It's not hard to predict that by 2013 or soon after, the education technology revolution will be in full swing, transforming the K-12 teaching and learning experience even faster than it is today.

## GROWTH OF WIRELESS LEARNING

In the future K-12 world, we'll be maximizing the use of innovative e-learning applications like streaming video, collaborative learning environments and learning management systems. We'll be well on the way toward full 1:1 computing classrooms. We'll be using online assessment as a matter of course. Most important, we'll be teaching and motivating students more personally and more successfully.

We'll be accomplishing all this through the increased use of technology, including powerful communication devices — laptops, netbooks, mobile devices, tablet computers and more. In many cases, these will be a mix of school-supplied equipment and personal student devices. All of us, including students, teachers and administrators, will be using these devices inside and outside the classroom, and within and beyond school buildings and premises. Making it all possible will be "always-on-everywhere" learning environments enabled by the expanded use of high-speed wireless technologies.

## BEYOND E-LEARNING

Of course, in the K-12 environment, educators and administrators will be using wireless broadband for much more than e-learning. We'll be enhancing the safety of

our students, teachers and employees with real-time communications and video surveillance solutions in buildings and on campus. To further increase safety, we'll be tracking our students whereabouts at school and in transit on school buses. We'll also be using our networks to increase operational efficiency by improving administrative, maintenance and security productivity. Equally important, we'll be reducing costs through increased efficiencies and lower total cost of ownership (TCO).

## ENTER THE FUTURE TODAY

But as we look at the education technology-driven future, we are also looking at some enormous challenges confronting K-12 educators and administrators. This kind of change doesn't happen by itself and it doesn't happen overnight. As the global leader in wireless technology and innovation, Motorola offers the education community the technology and networking expertise that help K-12 schools and districts begin entering the future today... which is not a moment too soon.

What are some of the most common uses for wireless broadband in future K-12 environments? It's certain that they'll include a number of innovative technology solutions that will be crucial for a large majority of K-12 schools and districts.

**"Learning can no longer be confined to the years we spend in school or the hours we spend in the classroom: It must be life-long, life-wide, and available on demand."**

BRANSFORD ET AL., 2006\*

\* Bransford, J. D., Barron, B., Pea, R., Meltzoff, A., Kuhl, P., Bell, P., Stevens, R., Schwartz, D., Vye, N., Reeves, B., Roschelle, J., & Sabelli, N. (2006). Foundations and opportunities for an interdisciplinary science of learning. In K. Sawyer (ed.), *Cambridge handbook of the learning sciences* (pp. 19-34). New York: Cambridge University Press.



# ALWAYS-ON- EVERYWHERE LEARNING ENVIRONMENTS

## 1:1 CLASSROOMS

Mr. Garza's sixth-grade classroom is studying the planets. There are 27 students in the class and each has a wireless computing device. Some are using their own personal devices such as smartphones or tablet computers, others are using laptops supplied by the school. Regardless of device, all students are using the same e-learning application, which delivers the lesson content, including high-resolution photography, streaming video and interactive simulations. This allows Mr. Garza to spend more one-on-one time with those students who need the most individual attention, while other students can work on their assignments at their own pace. Students especially interested in the subject can also access additional information about the solar system from the application itself or from the virtually unlimited resources of the web.

Motorola's indoor wireless local area networks (WLAN) based on powerful 802.11n technology provide the broadband infrastructure that supports the bandwidth-intensive personalized learning environments of 1:1 classrooms like Mr. Garza's. Our unique, innovative adaptive architecture delivers the high levels of bandwidth needed to provide highly reliable high-speed e-learning over a single access point. This was demonstrated in October of 2010, for example, as Motorola set a Guinness world record for Most Powerful Access Point based on our ability to stream video to 84 laptops from a single access point. Our solutions are proven to deliver reliable, high-performance

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**"The Motorola wireless network... lets us administer our state-mandated tests in a stress-free environment because our students have reliable connectivity to the proficiency exams."**

LYLA DOWNEY, ASSISTANT SUPERINTENDENT OF TECHNOLOGY  
CAMPBELL COUNTY, WYOMING, SCHOOL DISTRICT

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service even in dense and difficult RF environments like a crowded classroom, computer lab or testing environments in which multiple mobile computing devices are being used simultaneously.

## HIGH-SPEED CONNECTIONS

Many districts have fiber or wired connectivity to connect schools with high-speed access. Many others, however — especially those in rural areas — don't have cost-effective wired services available to them and are unable to afford the digging and trenching necessary to extend their own wired networks to school facilities. That's a huge problem. If you can't bring broadband into your facilities, your students and faculty can't use the bandwidth-intensive applications and tools of e-learning, at least not without serious reliability and service issues. Every school dreads the idea of programs freezing in the middle of class, or the network going down during mandated online assessment tests. Because it can be installed quickly and affordably, with no digging necessary, wireless is the technology of choice for bringing broadband service to these facilities. The exceptional cost-effectiveness of wireless is also making it the connectivity solution of choice even for non-rural schools and systems.

As a respected wireless technology and solutions leader, Motorola is now helping a broad range of K-12 schools deliver high levels of bandwidth to their facilities and campuses. Our point-to-point (PTP) and point-to-multipoint (PMP) links deliver the speed of hundreds of T1 lines, providing the throughput necessary to maximize performance of bandwidth-hungry e-learning applications. They also deliver the reliability crucial for e-learning and online assessment, and can be deployed as highly cost-effective backup layers to existing fiber backbones. Our PTP and PMP solutions can also connect other locations — such as community centers, churches and other facilities — where school-sponsored extracurricular activities and distance learning programs take place.

**"We face two major challenges. The first is the rapid growth of Internet-based educational resources such as streaming multimedia content. The second is a huge increase in the number of students with Internet-enabled wireless laptop computers, phones and other devices."**

STEPHEN CHOI, DIRECTOR  
OF TECHNOLOGY,  
SAN MARINO (CA) UNIFIED  
SCHOOL DISTRICT

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## OUTDOOR CONNECTIVITY

Future “always-on-everywhere” learning environments are not confined to indoor locations such as classrooms, study halls or libraries. Every day it seems, students of all ages, especially the “digital natives” now attending K-12 schools, consider their mobile smartphones and computers to be integral and essential parts of their lives. They want to be able to communicate whenever they wish and wherever they happen to be... indoors, outdoors or on-the-go. The students of today and tomorrow feel the same way about learning. They want to be able to do their homework, access the school’s network, talk with teachers and collaborate with other students when and where they wish. They want to be able to work in the school’s outdoor common areas, on the street, in the parking lot, anywhere on campus or even in areas close to campus.

Motorola’s innovative and powerful 802.11n AP 7181 APs are the only access points designed from the ground up to cover open outdoor spaces such as campuses. Our AP 7181s deliver seamless indoor/outdoor coverage that helps transform an entire campus — including some adjacent areas and neighborhoods — into always-on-everywhere learning environments. In addition, Motorola’s wireless mesh networks provide exceptionally wide outdoor coverage across the entire campus including athletic facilities and even extending into neighboring homes and shops.

## WIRELESS SCHOOL BUSES

In the northeastern U.S., students in one large rural school district are bused to a gathering station, then transferred to another bus for the trip to school. State law requires that the school day begin on the second bus trip, with the ride being designated as instructional time. How is the district handling this mandate? They are exploring making each bus an “extended classroom” by providing riders with on-the-bus wireless access to the school’s network on their personal or school-provided wireless devices. They can access the school’s e-learning tools, have school-filtered web access and submit work to teachers while en route. Other districts use wireless-enabled buses to allow students on field trips, or traveling to and from athletic contests, to do school work on wireless computers or other devices while traveling.

One of the most important learning initiatives of the near future is the movement to extend the classroom. One promising technology solution for achieving this goal is the wireless school bus. Wireless buses allow students to use transit time as productive learning time, giving them

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**“One of the things we’re most excited about now is [our trial of] having GPS and wireless on our school buses, helping us monitor bus location and giving students Internet connectivity on their ride to and from school.”**

JOE GRIFFIN, CHIEF TECHNOLOGY OFFICER  
KELLER INDEPENDENT SCHOOL DISTRICT, KELLER, TEXAS

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immediate access to the wide range of innovative online learning tools, such as streaming video and multiple database access. Motorola provides K-12 districts with 3G/4G-enabled access points that create WLANs on school buses easily and affordably. Our AP 7131 is the industry’s only tri-radio access point with an available 3G/4G modem and VPN capability, allowing schools to extend their networks beyond the classroom and after the bell rings without compromising security or content filtering.

## SCHOOL NETWORK ASSURANCE AND SECURITY

The Internet is one of the best things that has ever happened to learning. But, especially in K-12 environments, the Internet presents some serious challenges, too. Unrestricted access to the Internet by K-12 students can take them to unsuitable sites quicker than you can say Facebook or worse. In addition, school networks are susceptible to hackers and other unauthorized users who can and will prey on students, especially younger ones. Unauthorized access is also an enormous problem for the schools themselves as they must protect confidential student information and records that could be used by cyber criminals for identity theft and other illegal activities. Schools need powerful network security systems that guard against these issues, and that allow administrators to help prevent, detect and quickly respond to unauthorized student usage and network penetration by unauthorized users.

Motorola offers K-12 schools and systems one of the industry’s most powerful network security, management and assurance systems. Our AirDefense solution keeps outsiders out of the network by automatically detecting, assessing and disabling rogue access points on the network to protect personal information and intellectual property. AirDefense also keeps insiders in by keeping students from accessing unsecured, unfiltered and unauthorized hot spots. In addition, AirDefense Network Assurance solutions provide remote management and troubleshooting that empowers administrators to keep the network running reliably and at peak performance levels.



**“Motorola mesh networking capabilities allow us to run a point-to-point hop to the press box allowing [San Marino high school] to provide streaming video of football games so parents can watch them online wherever they are. The system also provides WiFi access to the crowd in the stadium.”**

DARRELL ALFARO, CEO  
MOONBLINK COMMUNICATIONS

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# SCHOOL SAFETY

## ENHANCING SAFETY AND SECURITY

High-speed wireless network technologies have become one of the most important guardians of student safety and security in K-12 environments. What happens, for example, when a natural disaster such as a tornado disrupts communications in a K-12 district? In one Tennessee county, an impending tornado caused all landline and cellular networks to be overwhelmed with traffic and unavailable. This failure of communications resulted in the school district being unable to coordinate with their 10 schools — and over 6,000 students — in advance. Each school and its security department were basically on their own without central communication. Parents couldn't call in, students couldn't call out; faculty, administrative officers and security personnel couldn't communicate with each other. Fortunately, it didn't lead to a second disaster. Immediately after the incident, however, the director of schools made safety and security the district's highest priority, installing a Motorola MOTOTRBO digital radio solution that provides system-wide communications for security personnel and staff without relying on landlines or cellular networks.

Motorola empowers K-12 districts to increase school and campus security with a wide range of solutions including the MOTOTRBO digital control stations used by the Tennessee county. The solution integrates voice and data capabilities and operates in both analog and digital mode, providing full communications with staff and with bus drivers using existing digital and analog radios. The county is now exploring the idea of tying bus fleet management into the digital system to allow digital tracking of buses and constant contact with drivers, especially crucial during emergency weather conditions.



## STUDENT TRACKING

Hypothetical situation: a fourth-grade class takes a field trip to a museum. A wonderful learning experience was had by all, faculty supervisors included. But, when the bus returns to the school, it is discovered that one child has been left at the museum. Fortunately, he is quickly located at lost and found, but what if he weren't? As careful as we all are with the safety of our students, mistakes can be made. In situations like this, technology can help ensure safety. By using student RFID badges and placing RFID readers at bus doors, schools can track which students are on each bus. By tying the readers to MOTOTRBO radios, data can be backhauled over the radio to notify supervisors immediately if there is a discrepancy, helping to ensure that every student who should be on the bus *is* on the bus.

Motorola helps K-12 schools and districts by providing the advanced mobile WLAN, GPS and RFID solutions that enable real-time tracking of buses — and of individual students — to help ensure safety day-in and day-out. With GPS and RFID on buses, districts can track all bus locations minute-by-minute. In addition, RFID readers at lecture hall or classroom doors can also significantly reduce learning time lost while teachers take attendance.

**“All I have to do is push the transmit button to speak to anyone at our schools or our alternative locations either privately or as a whole broadcast. If a crisis occurs at any of our locations, personnel can send me an emergency transmission and I can monitor the situation without the trespasser even being aware, allowing me the opportunity to contact 911.”**

JOYE FUSTON, C.L.A.,  
ADMINISTRATIVE ASSISTANT  
WARREN COUNTY SCHOOLS,  
TENNESSEE

## VIDEO SURVEILLANCE

Security cameras are proving their worth in K-12 environments as they provide real-time monitoring of entrances and exits, hallways, staircases and other important locations in the school interior or outside on campus. Potentially dangerous areas in the school or on campus can be continually monitored in real time. Entrances can be monitored for unauthorized visitors. Hallway and classroom security cameras provide continuous monitoring of common areas. In the event of an incident such as a fire alarm or a hallway altercation, security personnel and local first responders can receive live video from inside the school to improve situational awareness for safer, more effective response and resolution.

Motorola is a leader in video solutions, including video surveillance, for a number of industries including public safety, public administration and educational institutions at all levels. Motorola wireless technology solutions provide real-time transmission of video from remote camera sites in school facilities or in exterior sites on campus to administrative offices or control centers. In addition, Motorola's high-speed wireless infrastructure enables video-based distance learning capabilities to meet the ever-increasing demand for remote educational services and programs both on campus and at locations throughout the community.



## OPERATIONAL EFFICIENCY

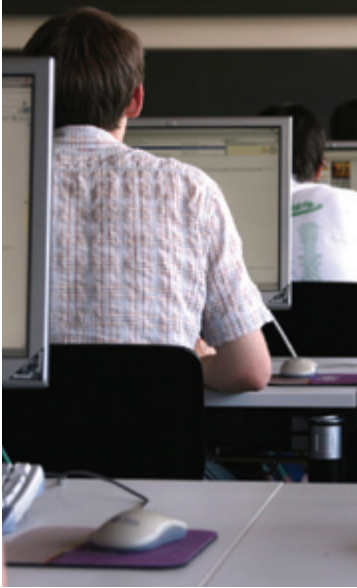
## CONVERGED CAMPUS COMMUNICATIONS

What if a teacher steps out into the hallway into the middle of a fistfight between a number of students? Who does she call for help? How fast can she do it? K-12 administrators used to dream about having everyone in the building or on the campus able to communicate with one another simply and easily... anytime and anywhere. And, importantly, on any device. Security personnel will push a button on their walkie-talkies and speak with a teacher on her personal smartphone, maximizing school safety. Maintenance workers using mobile computing devices will be able to communicate instantly with faculty, staff and administrators, enhancing operational productivity. A school officer can communicate with security or maintenance via a digital voice badge he wears on his lapel or shirt pocket. Whether transmitting voice, data or video, wireless communications are already making the dream of converged campus communications a reality in K-12 schools all over the globe.

Motorola communications technology is helping to make true converged campus communications a reality even today. Our TEAM and TEAM Express technologies and our innovative wireless voice badges empower campus employees to communicate by voice, push-to-talk, texting and e-mailing no matter what devices they are using: laptops, smartphones, even two-way radios. Motorola solutions enable cross-functional teams to collaborate and coordinate even if they are using different devices. In emergencies, our solutions help maximize personal safety and in everyday use, they help increase productivity and lower operational costs in virtually every department virtually everywhere on campus.

**“Motorola’s point-to-point wireless network provided us with even more bandwidth than we expected, so we can offer our 15,000 students new and innovative Internet-based programs now and in the future.”**

DERRICK HOFFMAN, SENIOR SYSTEMS ENGINEER,  
THOMPSON SCHOOL DISTRICT,  
LOVELAND COLORADO



## THE CHALLENGE OF ONLINE ASSESSMENT

In three to five years, most K-12 districts in the United States and in many parts of the world will be regularly performing online assessments. In fact, in a growing number of countries, online testing will soon become mandatory. This is already happening. In the U.S., an expanding number of states are adopting rigorous national “common core” educational standards that will become the basis for compulsory online assessment for proficiency tests by the 2014–2015 school year. To avoid the disruption and expense of having to wire a gymnasium or cafeteria for dozens of computer workstations for testing that can last for a day or more, many schools are turning to high-speed wireless solutions that will allow students to take tests in their own classrooms, significantly reducing labor, cost and chaos.

## ASSET MANAGEMENT

K-12 schools have a great deal to keep track of beyond students: school buses and other school vehicles and heavy equipment, computers, office technology and equipment, uniforms, sports gear, band instruments, all the way down to envelopes and ballpoint pens. Working manually, it might take one or more employees hours or days to complete the inventory of a single supply storeroom or equipment warehouse. The truth is, inventory and auditing are some of the most thankless, time-consuming and costly tasks in school administration. They’re also tasks that can use technology to spur huge productivity gains and deliver significantly reduced inventory and asset management costs.

Using our advanced bar coding and RFID solutions, Motorola is helping K-12 administrators streamline asset management, reduce losses and lessen the time it takes to do complete inventories. Imagine a school in which barcodes and passive RFID tags can make taking inventory a matter of minutes instead of hours or days. With a Motorola RFID reader or handheld bar scanner, a single worker can inventory or audit an office, a storeroom, a warehouse in a matter of minutes. This can include paper-based locations such as records departments that can help make inventory simpler and more accurate by placing barcodes or RFID on single folders or even single documents. Motorola asset management solutions can also provide effective and efficient fleet management, including real-time locationing of school buses and other vehicles and equipment for more efficient dispatch, maintenance and replacement processes.

## WORKFORCE MOBILITY

In K-12 operations, mobile workforces can play a critical role in reducing operational expenses with mobile communications from administrative offices and supervisors able to reach maintenance, security, landscaping and other workers on powerful mobile devices. This real-time mobile connectivity can deliver voice, data, even video information, dramatically reducing trips back and forth to the office, and improving response and effectiveness. A security officer sends a photo of a license plate of a suspicious vehicle parked outside a school. A school electrician receives a diagram of a classroom electrical system on his mobile computing device. A maintenance worker transmits video of a pothole in a parking lot or a downed tree on a campus walkway. A department supervisor dispatches a repair crew to the scene by contacting them and sharing the video on their mobile devices. Time is saved. Productivity is improved. Money is saved.

Motorola helps schools and districts deploy and expand wireless infrastructures that enable use of the powerful mobile devices of today and tomorrow. We provide the wireless infrastructures — WLAN, outdoor LAN and mesh — and devices — from in-vehicle mobile computers to ruggedized Enterprise Digital Assistants (EDAs) to two-way LMR radios that set the industry standards for reliability and intuitive use.

**“In a small school district like ours, we don’t have the budget to change out equipment every two or three years. When we needed a new radio system, we went with Motorola because of the dependability, reliability, and quality of the product.”**

FAY MILLER, ASSISTANT  
SUPERINTENDENT,  
KENT COUNTY SCHOOL  
DISTRICT

## MOTOROLA'S COMPREHENSIVE PORTFOLIO

# ALWAYS-ON LEARNING ENVIRONMENT

### INDOOR ACCESS POINTS



**AP 7131:** An industry first, Motorola's AP 7131 802.11a/b/g/n flagship access point offers high throughput and coverage as well as a tri-radio design that can enable always-on network assurance, security and compliance, and mesh networking. Motorola's Wireless Next Generation (WiNG) 5 capable intelligent access point collaborates with other access points and controllers to minimize network congestion without compromising security and provides unprecedented scalability required for supporting multimedia applications.



**AP 650:** The AP 650 is a thin multi-purpose access point designed to lower the cost of deploying and operating a secure, reliable 802.11n wireless LAN in classrooms and across campuses. The AP 650 combines simultaneous WLAN access and sensing, providing 24x7 wireless security and enabling IT administrators to remotely troubleshooting network performance issues at any location. The AP 650 is a WiNG 5 capable intelligent access point.



**AP 6511:** The AP 6511 WallPlate access point provides a unique low-cost way to retrofit dorms and classrooms with 802.11n wireless access. The AP 6511 installs in minutes over existing Ethernet wallplates and uses existing cabling to lower installation costs to a fraction of those for traditional access points. The high-power 2x2 MIMO radio typically covers multiple rooms, the AP can be autonomous or managed, and an optional 3-port Ethernet switch ensures you don't lose any precious wired ports.

### OUTDOOR AND SPECIAL PURPOSE ACCESS POINTS



**AP 7181:** The AP 7181 was designed from the ground up to cover large open spaces like campuses and athletic facilities with high-speed 802.11n access. Four unique panel antennas and a high-power 3x3 MIMO radio configuration offer superior outdoor coverage, even around buildings and foliage, and provide seamless meshing with indoor access points.



**AP 7131 with 3G/4G:** The tri-radio AP 7131 can be equipped with an integrated 3G/4G backhaul modem so a school's WLAN can be extended anywhere in the world there is 3G/4G cellular service. Ideally suited for school bus and campus transit applications, built-in VPN capability ensures users have access to private network resources while maintaining the same security and content filtering students get in the classroom.



**Mesh Wide Area Networks:** Motorola's mesh wide area networks portfolio leverages best-in-class mesh networking technology to provide connectivity to mobile devices in the outdoor areas. Designed to meet the challenges of demanding multi-use networks, mesh solutions provide the bandwidth to support video as well as voice-over-IP, while providing the end-to-end security required to comply with government regulations.

### WIRELESS CONTROLLERS



**RFS 7000:** Designed for large schools and campuses, the RFS 7000 offers a comprehensive feature set based on Motorola's WiNG 5 platform that distributes intelligence and network services to the edge of the network, helping education IT departments provide a better quality of experience for its students and faculty members. The RFS 7000 supports up to 96,000 mobile devices/users, and up to 1,024 adaptive 802.11a/b/g/n access points. RFS Integrated Services Controllers running the WiNG 5 operating system can cluster up to 24 controllers offering IT a single point of control for the largest of campuses.



**RFS 6000:** Designed for mid-sized facilities, the RFS 6000 offers a multicore multithreaded architecture with all of the advanced features of Motorola's WiNG 5 platform that distributes intelligence and network services to the edge of the network. The RFS 6000 supports up to 20,000 mobile devices and up to 256 Adaptive 802.11 a/b/g and 802.11 a/b/g/n access points.



**RFS 4000:** An 802.11n wireless services controller that integrates wired, wireless and security networking features into a compact and easy-to-use form factor, enabling schools to create survivable branch networks using a single platform. Also available with an integrated dual radio dual band 802.11n access point and built in applications such as Locationing for WiFi and RFID as well as Hotspot and VoWLAN/Video Services.

### WIRELESS BACKHAUL & DISTRIBUTION



**Point-to-Point (PTP):** Designed for schools and remote campuses in areas where fiber is not cost-effective or requires a back-up, PTP offers a cost-effective, easily deployable way to deliver the high-speed backhaul needed to enable the digital learning applications and devices that are prevalent today, even over long distances or in challenging, non-line-of-sight environments.



**Point-to-Multipoint (PMP):** Whether you need to extend broadband access to off-campus student housing facilities, connect community centers where extra-curricular activities take place, or extend the reach of your video surveillance to the dark corners of campus, PMP offers industry leading interference tolerance and low field failure rates to lower your total cost of ownership.

# MOTOROLA'S COMPREHENSIVE PORTFOLIO SCHOOL SAFETY & OPERATIONAL EFFICIENCY

## NETWORK MANAGEMENT & SECURITY SOFTWARE



**ADSP Network Assurance:** AirDefense offers remote troubleshooting capabilities, ideal for reducing the amount of travel IT staff often faces in large K-12 districts and distributed campuses. AP Connectivity Testing simulates clients to identify any problems in the network before users ever step foot into the classroom, and many other features help keep IT focused on learning applications, not wireless infrastructure.

**ADSP Security and Compliance:** AirDefense not only identifies rogue access points but can assess them and automatically suppress wired ports to take the guesswork out of rogue detection. AirDefense can also automatically terminate connections between student devices and off-campus WiFi hot spots, preventing access to unfiltered Internet and protecting CIPA compliance. Over 200 types of security threats can be detected by AirDefense, ensuring that the student information on your network stays secure.

**ADSP Multi-vendor Management:** AirDefense provides a single interface to manage a mixed-vendor environment during migrations or on a permanent basis.



**Planning Tools:** LANPlanner, BroadbandPlanner, and LINKPlanner round out the most robust set of wireless design tools that can import a broad range of building plans and site survey data, create 3D heat maps, and ensure that a network is designed right before the first device is installed.

## CONVERGED CAMPUS COMMUNICATIONS



**Voice over WLAN:** The TEAM VoWLAN solution provides a single device for all your mobile voice and data needs across campus - without recurring charges. Durable smartphones operate over your existing WLAN and offer mobile access to PBX-based telephony, texting, email, Internet and business applications, as well as instant PTT that interoperates with two-way radios, WiFi voice badges, and mobile computing devices so everyone can communicate, regardless of their device. Say good-bye to the bat belt.



**Two-way Radio:** Thanks to digital technology, MOTOTRBO mobile and portable two-way radios deliver double the capacity, improved audio clarity, 40% longer battery life and integrated data applications. MOTOTRBO is ideal for buses and school safety personnel that require not only reliable voice communication but also GPS locationing, text messaging, and other data applications in a private radio system that requires no monthly cellular charges.

## STUDENT & STAFF ACCOUNTABILITY



**RFID Tracking on Buses:** As RFID technology continues to spread, keeping track of younger students on daily bus routes or during field trips is easier than ever. School buses can be equipped with RFID readers such as the RD5000 that can record students' entry and egress from the bus, send live data to the district over a two-way radio or cellular connection, alert drivers when students are missing, and even provide visibility to parents to truly ensure no child is "left behind."



**Automated Attendance:** RFID enables the automation of attendance tracking to reduce errors and give teachers back a few more moments of instructional time. Fixed RFID readers like the FX7400 are easily installed at entryways, classrooms and lecture halls, can be managed over the same network as the WLAN, and provide asset tracking and theft prevention capabilities as well.

**Motorola Alerts:** Motorola Alerts is one of the most powerful crisis management and communication tools available for schools and colleges. A robust, enterprise-class, hosted solution, it meets the unique requirements schools need to communicate with distributed student, faculty and community populations, multiple campuses, mobilize response teams and campus security. Motorola Alerts can deliver important messages to tens of thousands of users immediately during any crisis or disaster.

## VIDEO SURVEILLANCE



**Wireless Broadband:** PMP and mesh technologies allow schools to extend video surveillance anywhere around a school, even to the far corners of parking lots and athletic facilities, as well as create a robust outdoor wireless network that allows schools to share their live surveillance video with first responders and security personnel so that video can be used to stop crimes, not just solve them.

## OPERATIONAL EFFICIENCY

**Asset Management:** Barcoding, RFID, and mobile computing technology enable cost-effective asset management solutions that can improve schools' operations and protect assets. Auditing processes can be streamlined to take hours instead of days, inventory can be better managed to reduce costs, student ID badges can be scanned instantly for disciplinary procedures, and high-value assets like computers and laboratory equipment can be tracked for loss prevention.



**Workforce Mobility:** Keeping mobile support staff moving around a school district and away from their desk is key to keeping them productive and keeping costs down. Rugged mobile computing devices like the MC75 and enterprise-class devices like the ES400 are ideal for giving facilities workers, IT technicians, and even school nurses access to the resources they need, regardless of their location.

What will K-12 environments look like in 2013, 2014 and 2015?

They'll be increasing student performance, they'll be meeting faculty needs, they'll be increasing safety and security, they'll be improving administrative efficiencies and they'll be reducing costs. And an increasing number of them will be relying on the powerful wireless technology solutions from a growing global leader in educational technology, Motorola. For more information on how Motorola wireless technology and solution can help your school or district stay ahead of the future, please call your Motorola representative, visit us on the web at [motorola.com/education](http://motorola.com/education), or call us at (877) 220-8301.

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