

Making Schools Safer Through Technology

Introduction

Our nation's schools are the incubators for our future. Each weekday, tens of millions of young people troop off to primary, secondary and post-secondary institutions to receive an education. But increasingly, the parents who send their children off to school and the teachers who work there are worrying about more than just how effectively schools are educating their young charges, but also wonder how safe are the schools.

The fact is, U.S. schools are still counted among the safest places in the world. Yet, parents and teachers remain concerned about school safety. These worries are all too often refueled by infrequent but high-profile school shootings and the fear of potential copycat crimes that could arise after such headline-grabbing incidents. To quell the concerns of their staff and the communities they serve, school administrators can be proactive in their approach to dealing with these safety issues by developing an emergency response plan that addresses risks as they evolve.

Areas for Improvement

Most school administrators, wary of the consequences of inaction, will choose to take steps to limit or respond to potential crises. Technology can help schools in facilitating effective crisis response, regardless of the type of crisis occurring. Various technologies can be used to immediately communicate en masse to students and parents, to direct people to assistance, to help first responders rapidly assess the situation and coordinate a response that facilitates recovery from an incident.

The U.S. Department of Education's Office of Safe and Drug-Free Schools (OSDFS) has defined a framework for local governments and schools to use in developing a crisis management plan. This framework can also serve as a useful tool in helping map out a

structure for using technological solutions to promote school safety across four major planning areas: mitigation and prevention, preparedness, response and recovery.

Here are some examples of how various technologies and techniques could be used within each of these planning areas. (Many of these solutions relate to more than one planning area – for example, video surveillance can help mitigate crises by acting as a deterrent and also help schools prepare and respond more effectively in the event of a major incident.)

1. Mitigation and Prevention

Before a crisis even emerges, there are several things schools can do to prevent, or mitigate the possibility. These include:

Anonymous Tip Web Sites and Voicemail

Setting up an online or phone voicemail-based repository for anonymous information can help school officials monitor student chatter on malicious activity. Students are often the best source of information regarding threats of violence, theft, bullying, cyber crimes and other malicious behavior. However, students fear being ostracized from their peers or retaliation if they are known to have conveyed information to school officials. An online tip site could allow any member of a school community to send an anonymous message to school officials, warning them of drugs, guns, violence, or student crisis – while meanwhile recording the sender's IP address, so as to minimize false reporting.

These sites or services are typically hosted, so the school itself does not need to commit internal resources to set up or maintain hardware or software. Rather, a service provider would charge the school a monthly service fee – typically assessed on a per student per month basis – for the rights to use the application. Vendors who offer these services have been known to offer grants of free use for a period of time.



Malicious Call Tracing

Dealing with prank calls is all too often a regular event for school administrators – the challenge is determining which calls are harmless pranks and which ones are serious threats. While schools can treat every malicious call as serious, and work to identify the caller, and if necessary alert police, there are also ways to trace or record threatening calls for police investigation.

Users of analog PBX or POTS (Plain Old Telephone Service) lines have the option of immediately dialing *57 to trace the inbound call. The Local Exchange Carrier will identify the originating call and release that number to a law enforcement agency if school administrators contact the local carrier regarding a harassment complaint. Also, local carriers typically have “annoying call” centers that can assist with monitoring harassing calls. Voice Over IP-based platforms can be used to support call tracing by law enforcement agencies.

Video Surveillance

The use of video surveillance can act not only as a deterrent to malicious or criminal activity, but its existence can also support a school’s efforts to stay prepared and respond to crises in progress. Closed-circuit TV surveillance systems have been successfully used as a monitoring tool for years in banks, hospitals and other public venues.

Recently, innovation driven by the advent of IP-based digital video systems has given rise to new solutions that provide more features than analog-based systems. These digital systems can be integrated with existing closed-circuit TV cameras, allowing for more cost-effective deployment. Some of the more advanced systems have ‘video analytics’ – which can help identify loitering, threatening body language, left-behind backpacks and packages – or can be activated by motion detection. In addition, video on digital systems can be more easily stored, searched, and retrieved than on analog systems and can utilize wireless technology to allow for a broader placement of cameras. When being used in a response scenario, video feeds can be distributed to first responders so they are aware of the situation inside the school before they enter.

There are many vendors who make digital video surveillance systems as well as vendors that specialize in the installation and maintenance of these systems. Firms that specialize in commercial and residential security systems are typically authorized to sell and install the leading digital video surveillance systems.

School Bus Tracking

A school district’s responsibility is to ensure student safety begins once the student steps on the school bus in the morning and ends once the student leaves the bus in the afternoon. Beyond ensuring student safety, the school bus fleet represents a significant management challenge for the transportation department in terms of cost optimization, performance, accurate driver compensation, and other issues. School bus tracking can help schools identify which drivers are speeding, or taking unauthorized routes or side trips, so that schools can protect themselves from crises or liabilities that could arise.

Tools for Schools

Schools must consider utilizing technology to help bolster their safety plans in four key areas. Here are the areas administrators must consider and the technologies that can help:

- **Mitigation and Prevention**

- Anonymous Tip Web Sites and Voicemail
- Malicious Call Tracing
- Video Surveillance
- School Bus Tracking

- **Preparedness**

- Enhanced 911 Applications
- Interoperable Communications
- RFID and Biometrics

- **Response**

- Emergency Alert Broadcasting
- Instant Conference Calling

- **Recovery**

- Distance Learning

Several vendors offer software and hardware solutions that allow school districts to calculate accurate driver payroll to minimize inaccurate compensation, identify exact route time and mileage to optimize travel routes and reduce fuel usage, and determine optimal arrival and departure times from bus yards, boundaries, driver homes, school zones, and fuel depots. These systems can also identify excessive idling or situations when the bus is speeding or not moving, if the bus “stop” arm is deployed during scheduled stops, and when, where and how long stops are taking.

Many of these systems are built using both global positioning system (GPS) and cellular technology, or a combination of GPS and radio technology to track and communicate information back to school district servers. (GPS/cellular solutions tend to offer a greater range of coverage compared to GPS/radio options. GPS/cellular systems allow the district to track buses beyond the range of the radio tower owned by the school district, a critical feature for long distance bus trips.) The information gathered by these systems can be used to help plan optimal bus routes, minimize fuel expenditures and ensure accurate bus maintenance records. In addition, schools can use these systems to pinpoint the exact locations of school buses during emergency situations – critical information needed to respond to emergencies.

2. Preparedness

Technology can also help keep schools ready in case of an actual crisis. Some ways that schools can achieve this are by utilizing:

Enhanced 911 Applications

Large buildings or campuses relying on analog PBXs for internal communications present a problem for 911 call centers. Unless the school can provide an accurate location for each handset connected

to the PBX, the 911 call center will not know the exact whereabouts of the inbound caller and may direct emergency responders to the wrong place. Enhanced 911 applications can let public safety officials know the exact whereabouts of parties in a school safety situation.

Some states have enacted legislation that requires the users of analog PBXs to routinely update 911 call centers with location level information associated with each individual phone number to prevent emergency response errors. Many local exchange providers offer a suite of products for 911 call center facilities as well as the individual school district to use to help ensure that databases and call routing are accurate and secure, and that emergency responders are dispatched to the proper location.

Interoperable Communications

Schools need first responder wireless communications interoperability – not just within the same unit but across jurisdictions. The Department of Homeland Security (DHS) has taken the lead to define standards for communications interoperability. Specifically, the DHS created the Office of Interoperability and Compatibility to strengthen the national partnership of local, state and federal leadership to achieve emergency response interoperability in every community in the country. In addition, the National Incident Management System (NIMS) provides a standard framework for all forms of governments and commercial entities to use to work together to manage emergency situations.

There are several technologies from vendors such as Cisco, Raytheon and Federal Signal that can help schools create a common or integrated platform using technologies such as Voice over IP, radio and telephone interface units, and voice modulation recognition systems. These systems can provide integration between multiple types of radio systems on differing frequencies, as well as landlines, cell phones and push to talk phones. Some of these systems can also be used to distribute alert messages to first responders or the community at large to generate awareness of event statuses.

RFID and Biometrics

While privacy and cost concerns have somewhat dampened the adoption of radio frequency identification (RFID) and biometrics, some schools see great potential in using these technologies to track student attendance and generate parental notification if a student does not come to school. These technologies can be used to determine the whereabouts of students and faculty during an emergency. Additional applications include tallying automated lunch program charges, tracking nurse's office visits and library checkouts, and enabling secure access to classrooms and the school building.

There are two types of RFID applications: active and passive. Passive RFID tags have no internal power supply, and can be inserted into small objects like a card or a keychain fob, and read only at short distances. Passive tags also have limited data storage options – place, time, quantity, sensor data – so their best use is for predictable tracking work flow streams, such as following boxes or pallets moving from a warehouse to a truck, or to a store. In education, passive RFID tags can track when a student gets on and off the school bus and when they enter or exit school. Active RFID tags have an internal battery supply that allows real-time tracking of the tag from up to 300 feet away from the access point.

3. Response

Once a threat to school safety has begun, there are several technologies that can be employed to help quell the situation. Enhanced 911 applications, malicious call tracing and video surveillance, which can also aid in mitigation and preparing for crises, can help with responding to such events. Other means of support for response include:

Emergency Alert Broadcasting

These systems can be used to broadcast alerts across a campus, communicating critical and often life-saving information to students and staff during even chaotic circumstances when other means of conveying information may not be practical. For example, with large college campuses, alerting a widespread student population can be difficult given varying class schedules, multiple building sites, on- and off-campus housing and other factors which drive uncertainty as to whereabouts of a student and their proximity to devices receiving the alert notification.

There are many types of emergency alert systems on the market today and they can be classified into three unique categories:

- Hosted systems – where customers pay a monthly recurring fee for access to a web-based tool that will send text messages, emails or voice mails to cell phones, email accounts, or wireless devices in the event of an emergency. Vendors who supply these systems include Honeywell, US Netcom and Viyya.
- VoIP-based systems – usually XML-based applications that run in conjunction with customer premises equipment (CPE) VoIP systems from vendors such as Cisco and Nortel. Emergency alerts can be sent to VoIP phones or to non-VoIP phones if the VoIP platform has a connection to the Public Switched Telephone System. These systems can be used for other applications such as taking attendance. Vendors who supply these systems include Litescape, Cistera Networks and IP Celerate.
- CPE-based Systems – which typically interface with analog PBXs to manage the alert notification process. US Netcom is one of the vendors that supplies such systems.

Instant Conference Calling

On-demand audio and video conferencing isn't the first thing that comes to mind when discussing school safety technologies. It is, however, a very effective tool in establishing communications among members of the crisis management team so that school officials can discuss and coordinate response activities. Local Exchange Carriers and other vendors provide audio and video conferencing services, both with or without reservation. In addition, VoIP-based communication platforms offer a full suite of conferencing solutions that allow instant audio and video conferencing.

4. Recovery

Once a crisis has occurred, school officials can utilize some of the same technologies that they might enlist to mitigate, prepare for and respond to crises. In addition, they can also make use of:

Distance Learning

If your school district or university is large and has many different groups affected by school safety issues, how do you make sure everyone is aware of your emergency response plan and understands their role? Distance learning platforms can be used to host recurring school safety video conference calls or to broadcast meetings between school leaders and public safety officials via streaming video. These systems can incorporate graphics, video and audio into web-based delivery, which can be viewed real-time or replayed at a later time.

Distance learning platforms can also benefit schools by delivering school safety plan updates to all classrooms, buildings, administrative offices as well as other public agencies and first responders. These systems can also capture recurring meetings with local public safety officials for replay, and cut down on the need for travel.

What Should Schools Do?

Once school officials figure out which technologies to enlist and what areas they first need to address, the next logical question may well be: How do I subsidize this?

There are several federal and state grants available to help schools enhance school safety. These grants, sponsored by the Department of Education's Office of Safe and Drug Free Schools (OSDFS), are typically awarded to help school districts establish training and development programs, and implement technology. Here are some resources that schools could look to:

Readiness and Emergency Management for Schools Grant Program

This discretionary grant supports efforts by Local Education Agencies (LEAs) to improve and strengthen their school emergency management plans, including: training school personnel and students in emergency response procedures; communicating emergency plans and procedures with parents; and coordinating with local law enforcement, public safety, public health and mental health agencies.

Priority is given to school districts that will use this grant to coordinate emergency response procedures with other local government agencies. In addition, school districts who have continual safety risks – such as earthquakes, tornadoes and flooding – and have not received a discretionary grant award from this program in the past may have a better chance of being awarded funding. Applications for this grant are typically due in the spring of each year. School districts and other local government agencies need to begin work collaborating on the grant application in advance of the deadline.

Safe Schools/Healthy Students Program

Administered by the OSDFS, this discretionary grant is much more comprehensive, focusing equally on school safety and student health. It funds initiatives focused on: safe school environments and violence

prevention activities; alcohol, tobacco and other drug prevention activities; student behavioral, social and emotional supports; mental health services; and early childhood social and emotional learning programs. Applications for grants are evaluated based on criteria that includes community assessment, goals and objectives, project design and management.

Safe and Drug-Free Schools – Title IV Part A (Governor's Grants)

This is a formula grant that is awarded based on the terms described in the No Child Left Behind Act of 2001, Title IV Part A. Eighty percent of the funds for this formula grant are provided by federal government, with the remaining 20 percent provided by state government. Grant allocation is based on: the amount of Title I funding a district received for the previous year (60%); and enrollment in all schools (40%).

Local Education Agencies may use these funds for a host of initiatives, including: drug prevention and education programs (pre-K-12); violence prevention; comprehensive health education; mentoring programs; professional development for drug, alcohol and violence prevention; implementation of strategies, for intervention, family counseling, community services and referrals; security measures such as safe zones of passage, metal detectors and hiring security personnel; student assistance programs; needs assessments; character education; student drug testing; and program evaluations.

Online Resources

Below is a brief list of other school safety resources available from the government:

1. www.ed.gov/about/offices/list/osdfs/resources.html, The website of the U.S. Department of Education's Office of Safe and Drug-Free Schools.
2. www.ercm.org, The Emergency Response and Crisis Management website, developed by the U.S. Department of Education, Office of Safe and Drug-Free Schools.
3. www.ed.gov/admins/lead/safety/emergencyplan/crisisplanning.pdf, A 146-page manual on school safety, a great resource for helping you develop your emergency response plan.
4. www.ed.gov/admins/lead/safety/crimeprevention.pdf, The U.S. Department of Education's 45-page booklet on "Student-Led Crime Prevention: A Real Resource with Powerful Promise."
5. www.nssc1.org, The website for the National School Safety Center.
6. www.sshs.samhsa.gov, For information about the Safe Schools/Healthy Students Initiative.
7. www.ncjrs.org, National Criminal Justice Reference Service, for information about school safety.

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