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## 2011 Wireless Technology Report



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2011 Wireless Technology Report

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*"I do not think that the wireless waves I have  
discovered will have any practical application."*

**HEINRICH RUDOLF HERTZ**  
German Physicist and Inventor



**FOREWORD:**

## Considering the Human Benefits of Wireless Technology

By John Watson and Jerry Denham

As purveyors of wireless technology products and solutions, we at BearCom can speak competently to the business user about two-way radios, wireless LANs, remote call boxes, voice-over-IP deployments, and video surveillance systems.

But that would only be the half of it. There's also the human story that needs to be told. There's the executive who is able to make his son's baseball game because he can make the necessary calls from the road. There's the emergency medical technician who is able to use her two-way radio to immediately notify the hospital from the field that a specialist is needed to meet them at the emergency room, saving the patient's life. And there's the police officer watching a bank of video surveillance monitors who can alert another officer in the field about a violent crime that is about to happen in a downtown parking lot.

These are the kinds of stories we tried to tell in the 2011 Wireless Technology Report, our annual snapshot of the wireless communications industry. We interviewed people like you and me, who recognize the benefits of wireless technology and what it can mean beyond the workplace. What does having a more durable two-way radio mean? Is there peace of mind for the hospital administrator who has had a remote call box installed in the employee parking lot? Are mobile command centers that can be deployed in dangerous situations saving the lives of police officers and citizens? What does the FCC's narrowbanding mandate mean for me?

While there are some who would decry the interconnectedness of our society as a burden that does not allow us any downtime, the more accurate conclusion is that wireless technology has given us choices. How we make those choices is up to us. For example, do we take advantage of convergence—the ability to perform many different tasks from one device—to free ourselves up to enjoy our lives?

We believe this is where it is all headed: simplify rather than complicate. And this year, as BearCom celebrates its 30th anniversary in the wireless industry, our promise to you is that we will make "simplification" our guiding principle as we work with our partners to provide you with innovative products and solutions. We believe the next 30 years hold tremendous potential for both BearCom and our customers. Let's get started. ●

Today's wireless technology is liberating business users not only to make their respective organizations more efficient, but to improve their own lives. And the convergence of wireless technologies and devices is having an indelible impact. The net result? Wireless users are gaining more control over when and how they work, as well as how they live.

*"While there are some who would decry the interconnectedness of our society as a burden that does not allow us any downtime, the more accurate conclusion is that wireless technology has given us choices."*



**JOHN WATSON**  
Chairman, BearCom

**JERRY DENHAM**  
President & CEO, BearCom





The Warren County School Board in Tennessee selected the Motorola MOTOTRBO solution—consisting of radios, desktop microphones, speakers, and an emergency power supply—because of what it could offer in the future. “We are currently looking into the prospect of tying our bus fleet into the digital system, which will allow us to stay in constant contact with our drivers and find their location during emergencies,” said Donny Caldwell, Director of Facilities.

## TWO-WAY RADIOS:

# Serving Customers Better and Enhancing Safety with Two-Way Radios

Craig Sager leaned back in his chair and pointed to the bottom of his shoe. “Before we went to our two-way radios, I might go through a pair of shoes in a matter of months,” said Sager, the Service Manager at First Texas Honda in Austin, Texas. “Now, I don’t have to walk back to the parts department or around the corner to see my technicians. I can just press a button and get an update.”

The various benefits to Sager extend far beyond his shoes. The real advantage is that Sager and his service representatives can be at their stations when the customers roll in for service. “There’s no telling how much goodwill we lost before, when our customers had to wait for someone to step outside and respond to their needs,” Sager added.

Sager can’t say that he has had a lot of experience with today’s two-way radio technology. But one thing he is sure of is that there is no turning back. “When I look back on it, I wonder how I ever got along without them in the first place,” he said. “It makes us so much more competitive as a business when we can provide a better customer service experience.”

Automobile dealerships aren’t the only ones that have benefitted from two-way radios. School districts also have come to rely heavily on such technology. Take the Warren County School District in Tennessee as an example. It recently deployed Motorola’s advanced two-way radio platform, MOTOTRBO. Among other things, the district experienced improved student and staff safety, increased privacy and security, and speedier communications.

Dr. Jerry Hale, the district’s Director of Schools, wanted a more cost-effective solution than the traditional landline system and one that would facilitate an “all-schools alert” via wide-area broadcast. Hale also sought the ability to place private calls, so his office could speak one-on-one to a school representative whenever necessary.

The safety factor also weighed heavily on Hale’s mind. In 2008, a devastating tornado had ripped through Warren County, knocking down trees and destroying property. At the time, Hale’s office tried unsuccessfully to contact each of the ten schools in the district to warn

them to take the approved precautions. But all available telephone landlines and cell systems were overwhelmed. “Because we couldn’t get through to anyone, each school was basically on its own without central communication. Immediately after that experience, we began to look for an emergency system where this would never happen again,” said Hale.

Icom has identified school districts that are equally as passionate about their two-way radios. The Crestview Independent School District of Ashland, Ohio is one of them. Needing to replace its 25-year-old analog system, the district first approached the incumbent manufacturer. Finding the cost prohibitive, it turned to Icom. BearCom oversaw the deployment of the new system. The audio quality of the new digital setup is much better than the old analog system, and the key personnel are happy with the features and ease of use of the new radios. The deployment was also helped by the fact that Ken Floor, the district’s School Bus Fleet Manager, had already had a positive

*Continues on page 6...*

Motorola MOTOTRBO™ Two-Way Radios



## CLEAR AUDIO FOR CLEAR COMMUNICATIONS

Providing your customers with the service they expect requires dedicated staff who are in constant communication. That’s where the MOTOTRBO series digital two-way radio from Motorola can help. Its enhanced audio quality and 40% longer battery life make responding to customers easier anytime, from anywhere throughout your coverage area. And with the flexibility to call an individual, select group, or every radio on your system, along with texting and GPS tracking, MOTOTRBO is the ideal solution for ensuring clear communications—24 hours a day, seven days a week. It’s just another way Motorola puts seamless mobility in the palm of your hand. HELLOMOTO™

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...Continued from page 4

experience with Icom two-way radios as a local volunteer firefighter.

While some public entities are attracted to the latest (and greatest) innovations in wireless technology solutions because of the benefits, others must embrace new technology because they don't have a choice. Narrowbanding is a case in point.

Narrowbanding is a Federal Communications Commission initiative that requires users to reconfigure the radio frequencies they are currently using, which will free up spectrum and satisfy the growing demand for bandwidth. Many older two-way radios use spectrum that is 25 kHz. Narrowbanding would require them to migrate to 12.5 kHz to be in compliance. The deadline set by the FCC is January 1, 2013.

While mandatory, there are numerous benefits associated with narrowbanding. Today, the VHF and UHF land mobile bands are highly congested, with little spectrum available for licensees to expand their existing systems or implement new systems. As licensees convert to equipment that operates on narrower-channel bandwidths, new channels will become available for licensing by parties that need them. The FCC also believes that the narrowband conversion will spark the development and use of new technologies that will further promote efficient spectrum use, be less susceptible to interference, and provide licensees with enhanced communication capabilities.

"Companies like Motorola are ahead of the curve when it comes to leveraging narrowbanding technology," said BearCom Executive Vice President Brent Bisnar. "MOTOTRBO is a great example of a platform that was developed with narrowbanding in mind."

Word has traveled fast, leading some municipalities that may not be able to afford the switchover to start allocating monies to cover the cost of compliance. The Intelligencer, a Pennsylvania newspaper, recently reported that the

township of Richland, Pennsylvania has added \$80,000 to its 2012 capital budget to pay for new police radios that satisfy the narrowbanding initiative. In New Britain, Pennsylvania, supervisors increased taxes by one million dollars to raise about \$166,000 for its project. And in Ivyland, Pennsylvania, the borough has set aside \$80,000 to pay for radios for both the police and fire department.

Bucks County, Pennsylvania Emergency Services Director John Dougherty, Jr. told the newspaper that the debate centers on whether to replace all of the older portable radios. Currently, only 750 of about 5,000 vehicle-based mobile and handheld portable radios could be used under the narrowband system.

Many of the county's fire departments have made their intentions clear, lobbying for a new radio system that operates in the 500 MHz band. Doing so would allow fire departments to continue using a small number of radios that are capable of meeting the FCC's new standards. It would also allow fire departments to continue using "private" channels that firefighters often use for operational communications, without tying up channels that are needed for dispatching emergency services.

BearCom's Bisnar cautioned the public sector to avoid using a "band aid" solution and take into consideration the second phase of the narrowbanding initiative that will take effect in 2017, which calls for dividing the radio spectrum in half again, meaning a single channel will go from 12.5 to 6.25 kHz. "While some radios in use can be reprogrammed to meet the standard set forth in phase one, all of the radios will need to be replaced in six short years," Bisnar said. "They are really better off making the conversion now and being done with it." Bisnar added that there are probably thousands of municipalities that are in the same shoes as Bucks County, whose fire departments are using equipment that is more than a decade old.

While there may be a temptation to get more life out of the current radios, other

officials also find fault with that logic. Doylestown, Pennsylvania Township Police Chief Stephen White told the newspaper that the fire department's preference to keep using the old frequencies in order to save money is shortsighted. "There should be no discussion whatsoever of not going to 700 MHz," said White, who is a member of the county's Public Safety Committee and a member of the International Association of Chiefs of Police. Part of White's rationale is tied to the findings by the federal 9-11 Commission's findings that New York City first responders were hampered by interference during their response to the terrorist attack on the World Trade Center.

The rationale of White and other public servants is inescapable, said Bisnar, who also credited the FCC with being proactive in facilitating compliance. "The FCC just launched a new Web page ([www.fcc.gov/narrowbanding](http://www.fcc.gov/narrowbanding)) that is dedicated to providing information and assistance to licensees migrating their land mobile radio systems from 25 kHz to 12.5 kHz or narrower channel bandwidth. This is another indispensable resource for the public sector."

"We are at a critical juncture in this process, especially with the deadline approaching," said James Arden Barnett, Jr., Rear Admiral (Ret.). "State and local governments are tightening budgets, (while) public safety officials are working hard to explain their fiscal and technical needs to lawmakers. We will continue to work with the public safety community in the next two years to meet these challenges head on." ●

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## MOBILE COMPUTERS: Making Processes More Efficient with Mobile Computers

From coast to coast, companies are deploying mobile computers to improve operations, setting an example for how wireless technology will be a core ingredient for corporate America in the prosperous years ahead.

Toyota's California-based Autoparts Division, for example, assembles two manual transmission models, which undergo approximately 12 processes from raw materials to the final product. Keeping track of the hundreds of parts that go into each of the models had been a challenge. Previously, Toyota employed a manual method to track the parts used, which meant that each assembly line worker needed a significant amount of time to capture and input this data into a centralized database. In seeking a better, more efficient way to manage the process, the division implemented Motorola's mobile computers. Reine Baltazar, Supervisor for the Systems Engineering Section at Toyota Autoparts Engineering, said, "The assembly group uses barcoding to track inventory (input and output), the quality control group uses a database to track finished goods (including warranty claims), and the logistics group uses the technology for the shipping schedule and loading setup."

These computers have been equally effective when deployed as part of an RFID solution as borne out at H&M Bay's cross-docking distribution center in Federalsburg, Maryland. Motorola mobile computers were instrumental in improving H&M Bay's frozen food transportation system to help ensure its customers' packaged goods are distributed on time and within the industry's proper temperature controls.

The H&M Bay deployment consists of RFID tags, which are placed on each warehouse storage location along with each pallet. Motorola's mobile RFID readers detect tagged pallets and tagged storage locations. Then a message is automatically sent to H&M Bay's automated inventory system to seamlessly record when each pallet has been removed from its location and where it has been placed. The mobile computers come into play in helping the company commission location tags and make initial assignments to the location.

Motorola's mobile computers were also at the heart of a deployment by Huntsman Corporation, a global manufacturer and marketer of differentiated chemicals. Huntsman sought a completely mobile

Companies and organizations are increasingly deploying mobile computers in the field, recognizing their durability and reliability as well as efficiencies associated with powerful new applications. Motorola is at the forefront in terms of introducing these new wireless devices. Its mobile computers have been deployed with successful results at thousands of locations, including companies like Huntsman Corporation, H&M Bay, and Toyota.

solution that would "eliminate defects, safety incidents, and unscheduled downtime at the facility," according to John Prows, Vice President of Manufacturing Excellence for Huntsman's Performance Products Division. Huntsman went with Motorola mobile computers primarily because of their ability to empower mobile workforces through real-time visibility into business-critical data.

The early returns for Huntsman have been impressive. With real-time wireless tracking of the rounds activity, the number of pumps requiring daily inspection has been reduced by 50 percent—allowing more time for other crucial inspection areas. Defect elimination work requests are now initiated in the field in real time.

Analysts, such as ARC Advisory Group analyst Harry Forbes, have even recognized the importance of Motorola's mobile computers and the application of wireless technology. "Huntsman's approach to providing real-time operational information to their people in the field," noted Forbes, "is a great example of the type of mobile application we will see more broadly adopted over the next few years." ●

Motorola Healthcare Solutions

## EXCELLENT PATIENT CARE WITHOUT ANY BOUNDARIES

Motorola extends mobility to the point of care and beyond. Our suite of handheld wireless devices allows healthcare personnel to share real-time information anywhere—inside or outside their facilities—to increase patient safety and provide more attentive care. These innovative devices also enable healthcare organizations to surpass previous limits on operational excellence and regulatory compliance. That means your staff will be more productive and spend more time focusing on caring for their patients. It's just another way Motorola puts seamless mobility in the palm of your hand. HELLOMOTO™

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Motorola's LS3408, LS3478, and LS3578 barcode scanners are rapidly amassing a reputation for durability among its loyal customer base. These models, which are offered by BearCom, were tested early on by Motorola engineers for the inevitable bumps and drops that occur in everyday use. Many of Motorola's scanners are also impervious to dust and water, ultimately reducing their total cost of ownership.

## ADVANCED DATA CAPTURE/RFID DEVICES:

# Putting the Rugged Back into Barcode Scanners

While Motorola's barcode scanners offer a litany of new features that spark efficiencies across the board for business users, there is one benefit that is being appreciated above all others at some companies: durability.

Rasmus Rune Kiileric, an IT consultant for Sauer-Danfoss, recently noted as much when he discussed his experience with other scanners. "In the past, we have experienced handheld scanners that lasted only six months. With Motorola, we got what we wanted—scanners that can be used in a really harsh assembly environment without rapidly deteriorating."

Sauer-Danfoss, a manufacturing company with plants throughout the U.S., equips vehicles with hydraulics. The company uses barcode scanners to scan products before they reach the testing phase. The environment in which the scanners are used contains hydraulic oil, which can degrade the efficiency of most scanners.

After an intensive search for a new model of barcode scanner which could survive in the adverse conditions of the manufacturing environment, Sauer-Danfoss chose Motorola's LS3408, LS3478, and LS3578 devices. The

company hasn't been disappointed. Nor will other enterprises, especially given Motorola's demonstrated commitment to improving its existing product line.

A case in point is a recent announcement by Motorola about a new series of rugged digital barcode scanners. "Motorola continues to raise the bar for advanced data capture with its extensive portfolio of digital imaging devices to support the varying needs of diverse customers across multiple industries," said Al Quinn, Vice President and General Manager of Advanced Data Capture, Motorola Solutions. He added that the new scanners from Motorola deliver superior performance on virtually all "symbolologies" that help increase productivity and improve operational efficiencies in challenging environments. "The net result," he said, "is that enterprise customers gain a competitive advantage."

Motorola has combined industry-leading technology with an exterior capable of withstanding the harshest operating conditions. Additionally, the new digital scanners address challenges related to noisy machinery and poor lighting. With bright LEDs, an adjustable-volume beeper, and a vibrating pager motor

placed in the handle, users can confirm proper completion of scans with visual, audible, and tactile decode feedback—a unique feature among barcode scanners.

The need for speed can be critical in some environments, such as the chaos associated with a typical election day in the U.S. For example, the Carolina State Board of Elections sought a solution to ensure that workers are more precise when handing out and processing ballots. Mistakes could result in a call for a re-election, incurring significant expense for the state. The Board turned to Motorola scanners to verify that each voter received the appropriate ballot, preventing potential errors. Volunteers found the scanning units easy to learn. In addition, the ergonomic design reduced user fatigue, and the process not only prevented mistakes, it streamlined the voting process. In addition, the Board has stated its plans to use Motorola scanners to improve accountability and efficiency in the voting equipment distribution process after the elections. ●



Motorola Barcode Scanners

## YOUR CUSTOMERS HAVE A WORLD OF NEEDS

From the loading dock to the point of sale and the manufacturing floor to the patient bedside, Motorola has an imaging solution that matches your customers' needs. Durable, intuitive, and remarkably easy to use, our full line of rugged, general purpose, and fixed-mount imagers not only make your customers more productive, they future-proof their investments. With a single flexible device they can scan 1D and 2D barcodes as well as capture images. It's just another way Motorola puts seamless mobility in the palm of your hand. HELLOMOTO™

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The ratification last year of the IEEE 802.11n standard powered the technology shift away from wired to wireless networks. It also enabled new technologies, such as Total Enterprise Access and Mobility—or TEAM—a Motorola creation that combines the functionality of an office phone, smartphone, and two-way radio into a single mobile device. With TEAM, employees now have the freedom to work from anywhere in the office.

**INDOOR WIRELESS NETWORKING SOLUTIONS:**  
**TEAM Solution Bridges the Gap between Desk Phones, Smartphones, and Two-Way Radios**

Waiting on an important phone call from the superintendent, a school principal doesn't want to leave his desk to respond to a skirmish between students in the lunchroom. Across town, a nurse carrying a mobile device stops walking in the hallway. Before her is the telltale blue tape, a visual barrier signifying that the hospital relies on an antiquated wireless infrastructure when building out its communication network—and that she can walk no further without her call being dropped. Patiently listening to a loyal customer, the CEO of a small manufacturing firm is reluctant to take her afternoon walk to check on her employees on the manufacturing floor because she doesn't want to interrupt the client by discontinuing the call.

Such scenes have become commonplace in not only the education, health care, and manufacturing industries, but in countless businesses all over the country. The application of new wireless technology has become something of a distant pipedream—until now.

The ratification last year of the IEEE 802.11n standard and the relentless

efforts of Motorola to create and leverage technologies that take advantage of 802.11n have opened the door to vast possibilities for the business user, which may finally eliminate the reliance on legacy wired connections.

One of the most meaningful examples of Motorola's initiative is an integrated voice and data solution called Total Enterprise Access and Mobility (TEAM). By partnering with BearCom, a solution integrator with extensive expertise in addressing wireless business applications, Motorola has made available a solution that provides users inside the enterprise with mobile access to their voice and data services.

In essence, the TEAM solution turns the desktop into a pocketable virtual office, delivering comprehensive mobile access over the WLAN to the voice and data services needed to increase productivity, collaboration, and customer satisfaction. Another plus is that the standards-based solution easily integrates as a non-intrusive overlay to existing PBX and WLAN infrastructures, providing a unified platform with enterprise-class

performance, unmatched scalability, and common management and security for both voice and data services.

In addition, TEAM Express—a fast, effective way to enable push-to-talk communications among disparate wireless devices—includes a wide range of Motorola voice-capable mobile computers, TEAM badges, TEAM VoWLAN smartphones, and even two-way radios.

Industry experts believe Motorola has created a winning solution. "As new mobile voice and data devices are introduced into the enterprise, organizations face communication silos that prevent groups of workers from being able to quickly and reliably connect with each other," said Rob Arnold, Senior Enterprise Communications Analyst at Current Analysis. "With its expertise in mobile device design, wireless LAN, and two-way radio systems, Motorola is uniquely positioned to break down these silos, making it integral to an enterprise's unified communications solution." ●



Motorola Two-Way Radio Batteries



**MOTOROLA BATTERIES ARE PROVEN TOUGH**

When staying productive means staying in touch, you need two-way radio batteries you can depend on, day in and day out. Fortunately, Motorola batteries are proven to be twice as tough as other brands when dropped—and that's just for starters. Whether they're zapped, shaken, frozen, or exposed to heat, you can trust Motorola two-way radio batteries to work better and last longer than ordinary replacement batteries—increasing your productivity and keeping your people connected at all times. It's just another way Motorola puts seamless mobility in the palm of your hand. HELLOMOTO™

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## WLAN DEFENSE SYSTEMS:

# AirDefense Offers a Security Blanket for WLAN Deployments

Security has always been top of mind at Carilion Clinic, a health care organization with more than 600 physicians in a multi-specialty group practice and eight not-for-profit hospitals. On one hand, Senior Vice President and CIO Greg Walton must shield sensitive patient data, as prescribed by the Health Insurance Portability and Accountability Act (HIPAA). On the other hand, he must ensure that the financial information traveling through his network, both corporate and consumer, is protected.

Carilion's mission is to "...identify and eliminate all unsanctioned wireless laptops, APs, ad hoc networks, and application-specific wireless devices as they enter our airspace," according to Walton. That's where Motorola and its AirDefense solution come into play.

AirDefense provides a highly advanced solution for rogue wireless detection, network performance management, remote troubleshooting, policy enforcement, and intrusion prevention. Its reputation was not lost on Walton, whose company became a Motorola AirDefense customer.

The importance of AirDefense has only been intensified by the growing popularity of wireless local area networks (WLANs). The analyst company, Aberdeen Group, recently validated this trend, writing that there has been "...rapid change and adoption over the last several years (of such technology). Since the WiFi Alliance first started certifying device interoperability in 2000, WiFi-based WLANs have reached near ubiquity in enterprises small to large. WLAN deployment is now a widely accepted overlay to the enterprise wireline network. In some cases, wireless networks are replacing wireline networks altogether."

Rogue wireless devices, such as access points (APs) are a good example. Such devices provide attackers with unrestricted access, bypassing firewalls and VPNs, to internal servers just as if they were connected to an internal wired port. But once the network has been comprised, identity theft becomes a real problem. Hackers can masquerade as an authorized wireless device and download what is supposed to be secure data. Denial of service (DoS) attacks are another danger. Hackers can easily

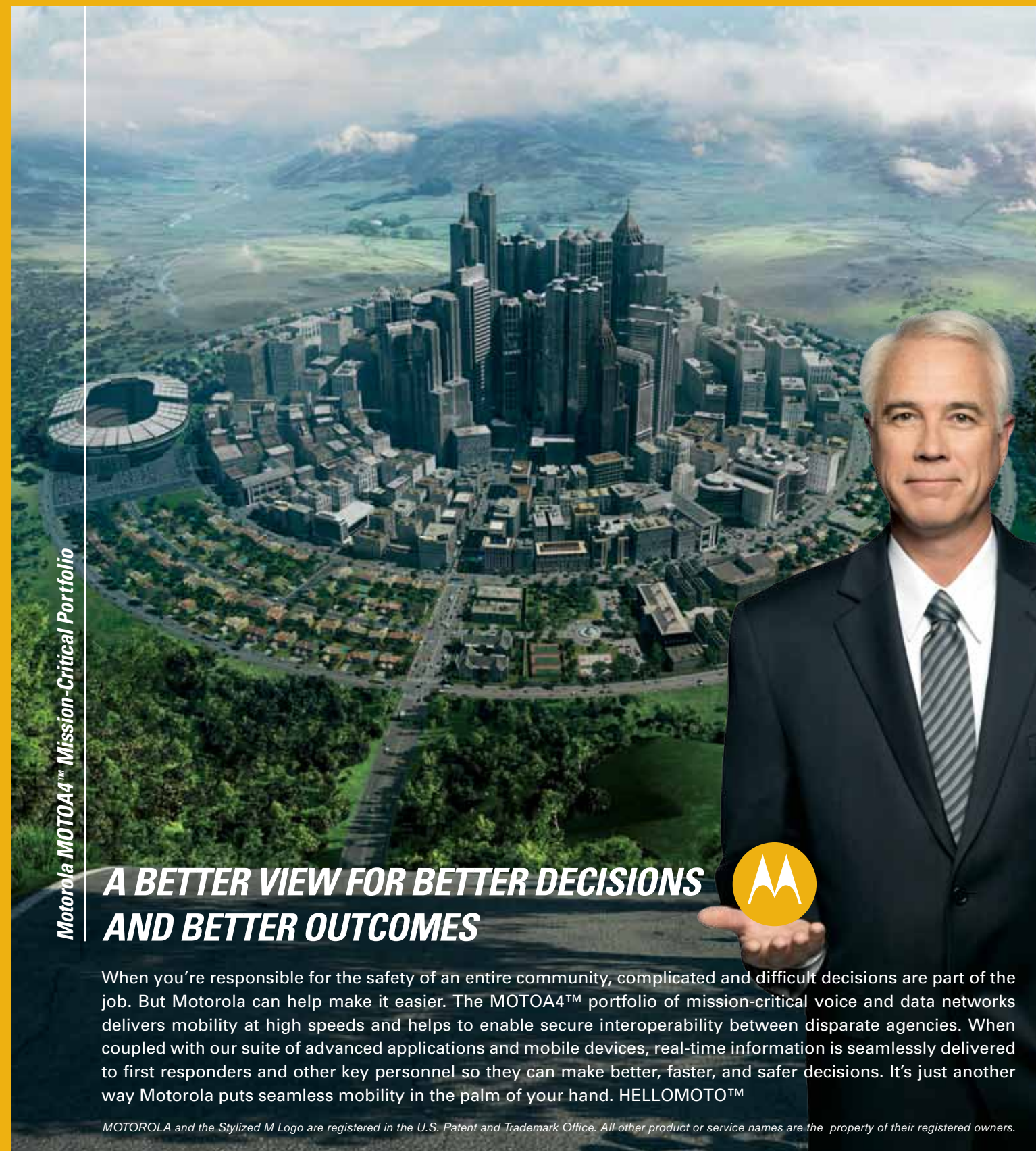
perform wireless DoS attacks, preventing devices from operating properly and disrupting critical operations. Non-compliant APs pose a threat as well.

Like healthcare, the retail industry also faces a number of security challenges. "Adoption of wireless LAN technologies, fueled by the recent ratification of the 802.11n standard and the performance benefits it offers, continues to rapidly expand in the retail sector and along with it, targeted security threats," said Mark Kroh, Vice President of Global Channels, Motorola Solutions.

Motorola's James Rakovan, Wireless Network Solutions Channel Account Manager, noted that more industries and businesses will follow. "It's just a matter of time," he said. "The advent of 802.11n and technologies that support its use have presented companies with an irresistible offer. AirDefense seeks to address that opportunity with a centralized, 24x7 monitoring and policy-setting solution, which has already proven itself in the field." •

Motorola's James Rakovan, Wireless Network Solutions Channel Account Manager, noted that more industries and businesses will follow. "It's just a matter of time," he said. "The advent of 802.11n and technologies that support its use have presented companies with an irresistible offer. AirDefense seeks to address that opportunity with a centralized, 24x7 monitoring and policy-setting solution, which has already proven itself in the field." •


Motorola MOTOA4™ Mission-Critical Portfolio



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When you're responsible for the safety of an entire community, complicated and difficult decisions are part of the job. But Motorola can help make it easier. The MOTOA4™ portfolio of mission-critical voice and data networks delivers mobility at high speeds and helps to enable secure interoperability between disparate agencies. When coupled with our suite of advanced applications and mobile devices, real-time information is seamlessly delivered to first responders and other key personnel so they can make better, faster, and safer decisions. It's just another way Motorola puts seamless mobility in the palm of your hand. HELLOMOTO™

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## RADIO INTEROPERABILITY SYSTEMS: Interoperability Bridges the Gap

The U.S. Northern Command, in partnership with the National Guard Bureau, recently recognized Raytheon JPS' ACU family of technology as a leader in the interoperability industry. The recognition came in the form of a document, which identified the ACU product line as the most common radio gateway used by incident responders today. "The ACU systems account for approximately 70 percent of the radio bridge market share in the continental United States," according to the document. "For direct interoperability between civil responders and military responders, the odds of interoperability are highest with the provision of equipment like the ACU systems."

Recently, Raytheon JPS collaborated with the Colorado National Guard Communications Element (CNGCE) to provide radio communications support and interoperability technology during the Democratic National Convention (DNC) held in Denver, Colorado in the fall of 2008. "The use of the ACU technology was invaluable in terms of interagency communication responsibilities," said Sergeant Robert Quinn of the CNGCE.

And what "responsibilities" they were,

given that the week-long convention attracted an average of 50,000 attendees per day at the Pepsi Center and approximately 80,000 attendees when Senator Obama accepted the Democratic Party's nomination for President of the United States at Invesco Field and Mile High Stadium. In addition, thousands of onlookers, support personnel, and media outlets arrived on scene. The last problem any public safety communications team leader wanted to see when such large crowds accumulate into one area was inadequate communications.

"The DNC was by far the most complicated deployment of our radio package and the ACU-1000," said Quinn. The end result—interagency communications between teams and control centers—made it worth the pain."

Besides the ACU-1000, Raytheon JPS markets a number of other products which provide for interoperability among multiple radio systems operating on different frequencies. The ACU-2000 IP interoperability system, for example, provides a SIP-based gateway to digitally converge existing radio systems with SIP telephones, networks, and devices. This allows customers to bring all of the

The city of Galt, California, and its Director of Public Works, Dave Tucker, took to heart the Department of Homeland Security's mandates for a more terror-free environment. The city required a different type of deployment of interoperability systems, which can best be described as a communications gateway that patches together the two-way radios of different agencies and departments to help ensure connectivity during emergencies.

advantages of the open-standards SIP protocol to their radio systems.

The ACU-1000, meanwhile, enables communications between diverse devices by cross-connecting each device's base-band audio. The unit is completely scalable and field configurable and is easily controlled using software.

The ACU-M, Raytheon JPS' most compact unit, provides interoperability between its four audio ports, two VoIP channels, and a headset port. It is small enough to be easily transported and robust enough to complement any communications suite.

Next, the ACU-T is a lightweight, tactical system suitable for LMR, P25, TETRA, HF radio, trunking systems, Nextel, telephones, and SATCOM systems. The ACU-T offers the form factor, flexibility, and features required for tactical, fixed, or vehicular interconnect applications.

Finally, the TRP-1000 system consists of one or more transportable cases and includes multiple radios pre-wired to an ACU-1000. The radios, which cover all frequency bands, can be cross connected through an ACU-1000. ●

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The Dallas Police Department is hitting its stride in fully leveraging its IP video surveillance system. “The video operators were trained to immediately begin utilizing the video cameras if a call was dispatched within the viewing area and stay in communication with the responding officer,” DPD Assistant Chief Vincent Golbeck said. “Many times, the elements of the offense are corroborated by the video surveillance footage.”

## IP VIDEO SURVEILLANCE CAMERAS: Video Surveillance Systems Take a Bite Out of Crime

The City of Dallas is full of unique and hip environments, such as Uptown, West End, the Arts District, Deep Ellum, and Jubilee Park. But up until recently, you couldn’t fully appreciate the city and all it had to offer without the nagging fear that you might be the victim of a crime.

That fear has all but evaporated now, thanks to the city’s decision, with the help of technology partner BearCom, to deploy an IP video surveillance system. Today, the Dallas Police Department monitors much of the downtown area with more than 100 surveillance cameras manufactured by Sony. The system not only leads to the arrest of criminals but serves as a powerful deterrent.

Not surprisingly, the market for such systems in both the public and private sector is projected to grow at a rapid pace. Driving that growth are a number of factors that are making the deployment of network-based IP video surveillance systems a preferred solution.

Assistant Chief Vincent Golbeck of the Dallas PD’s Patrol Division was well aware of the potential of such systems when the idea of deploying cameras was first introduced in Dallas. “The private

sector has used security cameras for decades, where they have proven to be a deterrent and a great source of intelligence,” he said.

So far, so good. “We’ve shown a significant reduction in crime for the three areas where we currently have the cameras deployed—Downtown, Uptown, and Jubilee Park,” Golbeck noted. “We made more than 2,500 arrests last year alone utilizing the cameras. Another added benefit has centered on quality of life violations such as panhandling, open containers, public intoxication, drug sales, burglary of coin operated machines, etc.”

There are many other sectors that are embracing IP video surveillance systems, such as housing developments, hospitals, local government agencies, municipal parking lots and schools. Schools—from K-12 to colleges and universities—have an enhanced interest in safety and security measures. They want to deter violence, drug dealing, and other criminal activities. They also need to capture evidence in order to successfully prosecute criminals.

Another key market continues to be the small- and medium-sized business sector,

where video surveillance solutions offer a cost-effective way to monitor and protect their assets and employees. “When we opened up a plant in Mexico, we needed an inexpensive way to monitor not only activities within the plant, but also around the perimeter,” said Brad Heath, CEO of VirTex Assembly. “Today, with a click of the mouse, I can see in real time what is going on at the plant.”

Whether it is the public or private sector, the benefits of IP video surveillance systems are only now being fully realized. One example of this is the ability to more easily search video footage that is stored digitally and archived on network servers. Another example is having the capability to set the system so that it can be triggered by specific events, such as the detection of motion after business hours.

For the Dallas PD, more improvements are planned for the future, according to Golbeck, who expects to see new technologies deployed around facial recognition and repetitive pattern recognition. “Everyone wins with these technological improvements, except the criminals,” he said. “And that’s the way it should be.” ●



## Draw the line

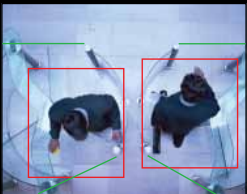
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The versatility and flexibility of video surveillance networks, such as those supported by Firetide, are major factors for a lot of municipalities. The city of Sandy, Utah, which is a suburb of Salt Lake City, identified that value proposition in its recent wireless mesh network deployment. "The real beauty of the Firetide wireless infrastructure is that it can be used in so many different ways," said Sandy Police Department Chief Stephen Chapman.

## MESH BROADBAND NETWORKS: Improved Video Quality Just One Benefit of the Latest Mesh Broadband Products

Grainy videos can equal misidentifications and huge embarrassments for police departments. So it's no surprise that as wireless video surveillance networks surge in popularity, companies like Motorola and Firetide are responding with solutions that emphasize high-resolution video and other benefits.

Take Firetide's new MIMO-based (802.11n) mesh solutions. The company recently deployed its technology in Phoenix and Miami, reaffirming its commitment to providing significant economic and performance benefits for city-wide municipal infrastructures.

The Miami Police Department is currently using the Firetide HotPort 6000 nodes and the MIMO-based HotPort 7000 equipment, with the primary objective of increasing its video surveillance coverage in the downtown area. During a recent upgrade to the system, the Miami PD replaced the backhaul connection with a Firetide HotPort 7000 link and added two dual-radio Firetide nodes, converting the initial point-to-point installation to a fully meshed configuration. This modification added redundancy to the system and

eliminated the single failure point of vulnerability. "The Firetide MIMO product allowed us to seamlessly integrate and expand our capabilities," said Tony Utset, former CCTV Project Manager and Executive Assistant to the Chief of the Miami PD.


Other users have been similarly impressed with Firetide's solutions. With the help of funds awarded by the Texas courts from money seized in narcotics enforcement operations, the border town of Mission, Texas installed a wireless video surveillance system at both an athletic complex and the new bridge over the Rio Grande River to Mexico. "We chose Firetide's solution after reviewing its successful installations in Dallas, Chicago, and Phoenix. We believe Firetide is one of the most reliable and expandable wireless network systems, since it is uniquely capable of supporting video plus other data and voice applications on the same network," said Mission Police Department Chief Leo Longoria.


Another recent deployment at California State University at Long Beach also has been deemed a success. In that case, the

economic benefits of wireless technology were as much a factor in the decision to deploy the network as fighting crime. "We would have been trenching all over the place, which is horribly disruptive and just wouldn't fly," said Greg Pascal, Communications and Information Systems Manager for the university's police department. "We had no other option but wireless."

Like the City of Mission, Cal State took a close look at comparable deployments involving the L.A. County Sheriff's Department and the Santa Monica Police Department. Pascal said the decision "really paid off," as the department was able to bypass "choppy or granular video" that typifies deployments where bandwidth is a constraint. Cal State built an entirely new wireless infrastructure for the project. It owns and operates the secure network, so it has the ability to add other high-bandwidth applications like data transmission. The university hopes that, ultimately, it will be able to stream live video into patrol cars on the beat. •

Motorola Mission-Critical Portfolio







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BridgeWave's wireless bridges power the backbone of the wireless video surveillance network for Highland Village, Texas. The network was first deployed at a new shopping center, which included high-end luxury retail shops and restaurants, in order to proactively deter crime. Highland Village police officers are now able to view the area at any time from both its central communications center and the department's remote police sub-station.

## POINT-TO-POINT BRIDGES:

# Point-to-Point Wireless Technology Enhances Safety and Saves Money

Corry Blount, the Captain of the Highland Village Police Department in Texas, is not one to rest on his laurels. So when the opportunity came to consider the deployment of a video surveillance network in what the FBI already deemed the "safest city in Texas," he jumped at the chance. But in executing his due diligence, Blount learned that there were many components that are central to a successful solution, not the least of which was BridgeWave, a leading supplier of wireless point-to-point bridges.

The Highland Village Police Department is now using its new wireless network to monitor suspicious activity, theft, car accidents, and to decrease incident response time. "It's nearly impossible to have a police officer on every street corner," Blount said. "However, since our police officers and first responders depend on video surveillance, the network running our video cameras must be up and running at all times." That's where BridgeWave's bridges come into play.

In the months since the deployment of the wireless network, the department has been pleased with its capability.

Future plans call for other deployments in Highland Village, such as at a local 15-acre city park and at either end of a pedestrian tunnel that goes under a main highway. "We're proud of this deployment and what it means for our citizens," Blount said. "I don't know why more police departments don't initiate similar systems. They should."

Of course not all deployments of point-to-point wireless technology are tied to video surveillance networks. In Franklin County, Virginia, for example, a different solution was used to knit together far-flung agency offices. Franklin County is 721 square miles of small towns and sparsely populated rural areas. While the idyllic rural beauty of the county attracts a growing population, lack of broadband access was limiting the opportunity to attract new businesses, as well as support the county's residents, schools, public safety agencies, and existing businesses. Faced with that challenge—and limited funds—Franklin County set out to find a workable solution.

By using existing towers and partnering with private landowners to build some

additional towers on their property in exchange for reduced service fees, the county enabled a network design that utilized 18 towers and water tanks. The "wireless glue" between the towers was Motorola's point-to-multipoint system, which enabled the county to deliver scalable, interference-resistant, high-speed connectivity to residential, business, institutional, and municipal locations. "We were able to grow a wireless mesh network from one tower to 18 towers in just over two years," Sandie Terry, IT Director for Franklin County, said at the time of the announcement. "The county is now positioned to provide more efficient services and bring more opportunities to local government, our citizens, and the businesses located in this county."

In the months since Terry's optimistic pronouncement, the benefits have come to fruition. "Our costs have been reduced by 36 percent," said Terry. "Broadband is quickly becoming a utility, like electricity and phone service. It's critical to attract new development and support both existing businesses and the growth of new business." ●

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## REMOTE CALL BOXES:

# Call Boxes Experience Resurgence among Many Business Users

Cell phones have become a powerful safety tool in recent years as their reliability has soared to unprecedented heights. But while the typical user may feel more secure because of this ubiquitous wireless technology tool, many campus police chiefs, public safety directors, administrators, and risk managers know that cell phones are not the end-all, be-all for protecting people in dangerous environments. In fact, increasing numbers of these decision makers are turning to remote call boxes.

Like security cameras, call boxes act as force multipliers in isolated, distant areas which cannot be easily patrolled. They also can accelerate response time, since the user doesn't have to fumble around for a cell phone and need only press a button on the call box to get a public safety official on the line. In addition, the flashing lights on many call box systems draw attention to the surrounding area, scaring away criminals.

The nation's college campuses, where violent crimes have become an all-too-common occurrence, are a case in point. The challenge in combating this trend is

that the number of campus police officers typically remains static. At the University of Texas, for example, there are less than a dozen such officers patrolling a campus that is home to almost 50,000 students. Luckily, these officers are not the only line of defense. UT has more than 120 remote call boxes strategically placed on campus and other student-populated areas.

The university first began installing call boxes in the late 1970s. The number has risen in recent years as officials began appreciating their value. Elliott Reep, the Co-Director of UT's Student Government Campus Safety Agency, believes that informing students about how to protect themselves—using call boxes for example—is the most important safety prevention tool a college can use. "We can't stop attacks or sexual assaults or instances like that," Reep said. "What we can do is have information at hand to make sure they take every step possible so they're not as likely to be a victim."

Students understand the value of call boxes and are not afraid to ask for them. In a recent letter to the Western Michigan University student newspaper, college

Enhancing the opportunity for more call boxes is wireless systems integrator BearCom. The Dallas-based company has the in-house expertise to develop customized, cost-effective solutions. "We're presently building call boxes for a large auto manufacturing company in Michigan," said Vernon Hogue, Special Projects Manager at BearCom. "These units are basically radios that are secured to walls and are used by employees who do not have access to handheld radios."

student Kelsey Barnes noted that she was "surprised" by the "lack of emergency call boxes" on campus. "Because there are so few call boxes, there is a lower feeling of overall safety. It's not that Western is a dangerous campus; it's just that safety is not promoted. If there were more of these call boxes, people would feel much safer."

Call boxes also can be a very powerful resource on the nation's highways. Take Highway 38 in California, where there was a recent controversy when call boxes were removed because of a change from analog to digital service. San Bernardino County Fire Department Assistant Chief Peter Brierty was one official who went on the record that more call boxes should be installed. Functioning call boxes help emergency crews respond more quickly to accidents, according to Brierty. "The quicker we get the call from the reporting party, the greater the survivability of the victim in a trauma," he said.

From making businesses run more smoothly to preventing crime, call boxes are undergoing a resurgence, taking their place as an important item in a menu of wireless technology options. ●

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## EMERGENCY COMMUNICATIONS SOLUTIONS:

# Mobile Emergency Command Vehicles Establish Foothold in the Public Safety Sector

The iconic television show of the 1980s, Miami Vice, ushered in a lot of different ideas about police work, especially about undercover operations. Perhaps one of the most fascinating concepts was the use of a vehicle loaded with the latest in wireless technology, which the Miami Police Department used for surveillance purposes on the show.

The modern-day equivalent of that vehicle, the mobile command center (MCC), is alive and well, though it has many, many more uses than those contemplated on a television show.

In 2008, Lieutenant Jeff Cotner of the Dallas Police Department recognized that the City of Dallas, as well as the police department, had a need for such a capability. "The City of Dallas did not have up-to-date technology or other similar capabilities," Cotner said. "Previous mobile command centers did not have wireless or satellite connectivity, radio interoperability, video conferencing, or the ability to receive varied video feeds. The city needed a vehicle with multi-use rooms and the ability to stay on station for days, not hours."

A couple of factors contributed to that need being met. First, the city and the department had a previous business relationship with BearCom, involving the deployment of a wireless IP video surveillance system throughout downtown Dallas. Additionally, BearCom had experience with mobile wireless vehicles, having produced a number of trailer-mounted command centers, called QuickSite, over the past four years as a way for first responders to re-establish communications after a natural or manmade disaster.

BearCom originally introduced the QuickSite trailer after Hurricane Katrina. One of the attractions of the trailer was that it could easily be towed by a standard pickup truck or SUV, or even airlifted into place by a helicopter. It also could be set up and operational within 30 minutes.

By contrast, the MCC deployed by the Dallas Police Department in October 2009 was ready to roll from the start, and it was easy to use. "The upgraded technology required some training, although not extensive," noted Cotner. Thus far, he said, the MCC has been

used "primarily on SWAT callouts and planned special events, such as the White Rock Marathon and the Dallas Veterans Day Parade. The vehicle has also been used to support our training exercises."

The typical configuration for an MCC consists of four to six workstations for real-time communications, a conference room for on-site meetings, a galley, and a lavatory. The exterior features a workstation with access to telephone, two-way radio, and audio/video equipment. A telescoping mast enables a closed-circuit video feed to survey the incident and can include thermal imaging or infrared camera options. Local TV "send and receive" capabilities are accessed via a satellite dish.

The early verdict is that the product has been well worth the investment. "The vehicle is such an improvement over its predecessor," said Cotner, who believes the MCC will yield many "unexpected benefits" in the near future. "The vehicle will support a myriad of missions, is scalable to incorporate emerging technologies, and will be increasingly deployed," he added. ●

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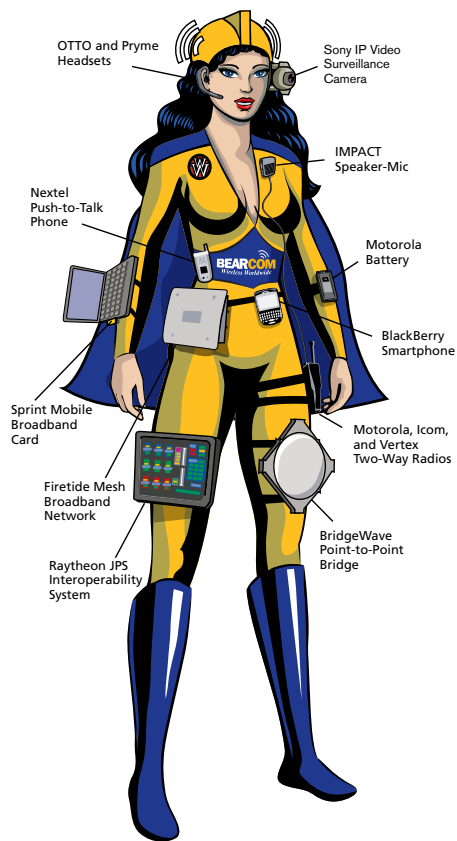
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## Q&As:

# Converging on Solutions that Will Make Business More Efficient and Environmentally Responsible

### Question:

*When are we going to have a wireless device that meets all of my needs in a business setting?*

### Answer:

Funny you should ask me that. I recently reviewed a survey which suggested that almost half of all U.S. consumers want a single mobile device for all their needs, from voice and e-mail to Web browsing and data-driven applications.

This demand, which has only recently intensified, has been around for a while. That's why manufacturers like Motorola and Research In Motion (with its ubiquitous BlackBerry) have been hard at work creating devices that can perform many of the same functions as notebook computers, such as e-mail and other applications, including GPS.

At the same time, there has been a learning curve, according to Chip Lister, Managing Director of Data Development Worldwide, who told us "just because technology makes a capability possible doesn't mean the consumers will value it. The device with the right mix of capabilities delivered at the right price point is going to win in this market."

A recent ABI Research report suggested that the shipment of all categories of wireless devices, including mobile handsets, mobile Internet devices (MIDs), netbooks, mobile consumer electronics products, and cellular modems will nearly double in shipment volume by 2014. The interesting development, according to ABI analyst Michael Morgan, is that while such convergence continues, there is also an element of divergence, where, for example, some business users seek and use low-cost wireless devices that focus on one or two things and do them very well. An example of such a device

is the BC130, a two-way radio that is manufactured by Motorola exclusively for BearCom.

For the rest of the corporate community, however, convergence is the current watchword. Charles Golvin, Senior Analyst with Forrester Research, noted recently that "a big over-arching theme... is the idea that more and more things are being connected."

Some of the other trends involve the corporate community tracking consumers, especially tech-savvy Generation Y users. An example of this is how e-mail is starting to lag instant messaging, text messaging, and communication through social networks. These young workers will continue to infiltrate the work force, analysts suggest, with their demands and ideas of efficiency, spurring the creation of highly flexible devices that offer multiple channels. Analysts have also suggested that these Generation Y users will take their online identities with them when they change jobs, which could again drive convergence regarding devices that can effectively bridge all channels.

### Question:

*I have a small business, and we're ready to upgrade our fleet of two-way radios and cell phones. What do we do with the existing units, which have gotten pretty beat up over the years?*

### Answer:

Recycling wireless devices often helps reduce greenhouse gas emissions, saves energy, and conserves natural resources. Approximately 130 million cell phones are ready to be disposed of each year. Many of these devices are placed in storage, while others are thrown away. If users recycled 100 million phones,

*Continues on page 29...*

*...Continued from page 28*

enough upstream energy would be produced to power almost 200,000 U.S. households for a year. The positive impact on the environment would be even greater.

Motorola announced late last year that it had established a take-back recycling program for its customers to help them responsibly dispose of used equipment. Among the wireless devices covered in the program are Motorola-branded enterprise mobility equipment, such as mobile and portable two-way radios, handheld mobile computers, barcode scanners, and accessories. Batteries are also included but must be removed from the equipment before they are shipped for recycling.

Motorola, which collected more than 2,500 tons of electronic and electrical equipment waste for recycling in 2008, offers or participates in mobile phone take-back programs in 70 countries around the world. Motorola is tying the program to worthy causes, too. Its Race to Recycle program, for example, enables K-12 schools in the U.S. to earn extra cash by recycling mobile phones, with a portion of the proceeds generated from returned mobile phones going to participating schools.

Like Motorola, Sprint Nextel has also been proactive with recycling programs, which ultimately prevent thousands of tons of wireless equipment from entering the waste stream. More than 90 percent of the phones that Sprint collects are reused. Companies like Sprint also are making a difference by creating and introducing more eco-friendly products, such as its all-in-one vehicle and wall charger. Among its features is an inline USB port, which allows two devices to be charged simultaneously and operates within Energy Star guidelines.

Ralph Reid, Vice President of Corporate Social Responsibility for Sprint Nextel, told me that the accessories and other products are in line with the company's objective of offering its customers

"greener options for their wireless devices." Sprint, in fact, became the first U.S. wireless carrier to establish a set of environmental design criteria for future devices and a commitment to reduce paper usage by 30 percent during the next five years.

### Question:

*I heard that BearCom is celebrating its 30th anniversary in 2011. What does that mean for me, a wireless user?*

### Answer:

I recently interviewed BearCom's Jerry Denham, President & CEO, and John Watson, Chairman, where they discussed the successful journey that has made BearCom the largest dealer and integrator of wireless communications equipment in the country. My questions and their answers are detailed here:

*Who was your first customer?*

Denham: "Our first customer in 1981 was Contemporary Services Corporation (CSC), which relied on us to provide rental equipment for special events, including the Rose Bowl and the Super Bowl. CSC remains a core customer today."

*Clearly, your relationship with Motorola has been a very important one for BearCom's growth. Tell us about that key partnership.*

Denham: "We have enjoyed a long history working with Motorola, beginning as a provider of rental radios and transitioning into sales when Motorola moved into a distribution model in 1988. Today, we are the world's largest dealer of Motorola two-way radios and have twice won Motorola's Pinnacle of Customer Excellence Award (2006 and 2008). Much of that success is attributable to each company's willingness to go above and beyond to satisfy customer needs, as well as a strong match between Motorola's products and BearCom's services and solutions."

*How important are people to a company's success?*

Watson: "Working with good people is the most rewarding part of building a business. There is tremendous satisfaction when you see your employees succeed and become leaders. If anything should be celebrated on BearCom's 30th anniversary, it's our people."

*What is the BearCom's philosophy when it comes to customers?*

Watson: "We've been able to develop successful, long-term relationships with our customers by listening carefully, executing well, and taking care of the details. This has resulted in many companies in our industry coming to us to study best practices."

*How does BearCom separate itself from the competition?*

Denham: "The event management space has certainly been an important niche for us. One of our proudest moments was our involvement in the 1994 World Cup. Today, we have so much more experience in large events and so many good people, but we gained many contacts and new business from that endeavor. It really separated us from the competition. And we recognized that the special events industry was starting to grow, along with a number of its supporting event-driven businesses."

*What do you think the future will hold for BearCom?*

Denham: "As we have in the past, BearCom is going to continue to grow organically and through some limited acquisition. We are going to remain true to our core business of two-way radio products and take on and sell Motorola's expanded product portfolio. Technology is evolving, and we have the sales force and resources to evolve with it." ●



After Motorola purchased a controlling stake in Vertex Standard, Vertex went to great lengths to understand the needs of its customers and prospects in the LMR space. An example of this is digital technology, which makes sense for some customers who can benefit from the applications and other advanced functions. Other users may get all they need from analog.



**AFTERWORD:**  
**Vertex Standard Finds Success is Tied to the Customer**

**By Mike Gray**  
Vice President for LMR Sales, Vertex Standard

When Motorola purchased a controlling interest in Vertex Standard three years ago, the logic behind the acquisition was strategic. Vertex made great products in the land mobile radio (LMR) space. Motorola would put its muscle behind the Vertex product line and make it a global brand.

Have we been successful? Yes. Along the way, we also learned something very valuable that can apply to the entire wireless communications industry. It truly is about the people.

First, it was about educating a team of channel partners that would introduce the Vertex products to the marketplace. Second, and most importantly, it was about honoring the customers, both existing and future, in a way that respected their needs.

It is very fitting that *Today's Wireless World's* 2011 Wireless Technology Report focuses on the end user. We believe that customers—not only in the LMR space but of wireless technology in general—are more discerning than ever. They understand what the strengths and weaknesses of products are. And where they don't, we believe it is our obligation and that of our channel partners to further educate them.

This has been especially true in our business involving the Vertex Standard product line. This is a mature industry, where the customers have been using the same—or derivatives of the same—technology for 80 years. And yet there is change, such as the advent of digital technology, which can make it confusing for the end user.

Motorola, of course, has been a leader in the migration to digital technology. And true to form, Vertex Standard announced plans recently to introduce a series of digital radios this year. Yet, in our segments, not every customer needs to move from analog to digital right now.

Over time, we have learned that we can accommodate the needs of all our customers by treating them with integrity. It's an approach that underlies the commitment to success of Vertex Standard. ●

*“Over time, we have learned that we can accommodate the needs of all our customers by treating them with integrity.”*

**MIKE GRAY**  
Vice President for LMR Sales  
Vertex Standard



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Portable Radios



VX-354

VX-351

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Our number one goal is achieving superior customer satisfaction by delivering products and services that exceed your expectations. Vertex Standard radios are built to last and are backed by an industry-leading 3 year warranty – another great reason to choose Vertex Standard. Ask your Dealer for more details.

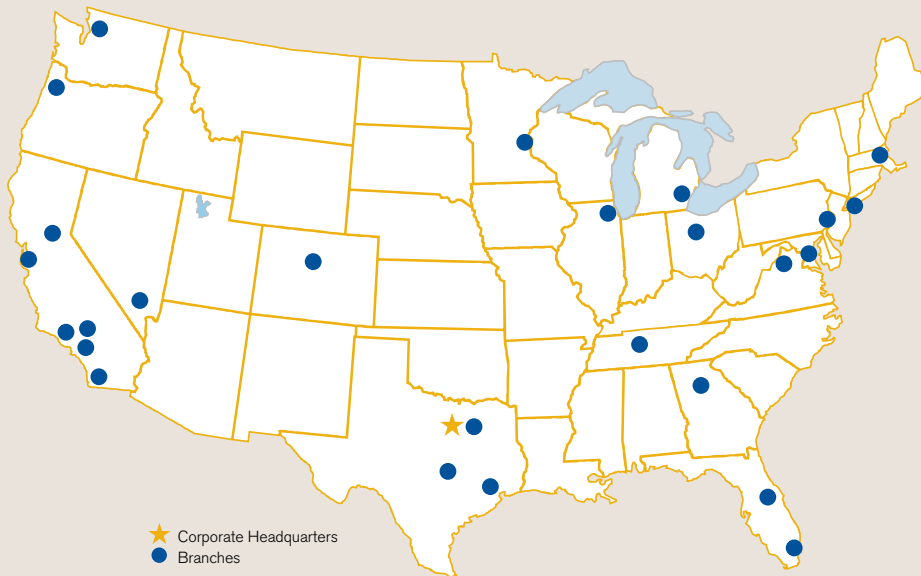
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BearCom provides a broad line of high-performance wireless communications products, services, and complete mobility solutions. Founded in 1981, BearCom is America's only nationwide dealer and integrator of wireless equipment, serves customers from 26 branch offices located throughout the U.S., has several affiliated offices around the world, and employs approximately 400 people.



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