

## ANTENNA SOLUTIONS FOR PUBLIC SAFETY BROADBAND COMMUNICATIONS



Police, fire, transportation and other public safety departments are pushing to improve their communications in order to enable faster and more effective emergency responses. Broadband communication facilitates the transmission of data such as video and enhances interoperability between public safety departments. Broadband technology has already been popular in commercial uses for providing faster and more reliable communications with greater capabilities. It is now being implemented by public safety departments with impressive results. PCTEL designs, develops, manufactures and distributes antennas that make such communications possible.

Applications for public safety broadband networks range from rescue operations to criminal enforcement to traffic flow control and more. Public safety departments that still rely upon 20th Century technology often only radio communication with first-responders, limiting the information that can be exchanged. In contrast, broadband networks created by combinations of cellular towers, satellites or fiber optic cables allow public safety departments to quickly share information that cannot be communicated by voice alone. Full motion streaming video of crime or incident scenes, blueprints of buildings, electronic health records, mug shots, fingerprints, automobile and license recognition systems can be sent through broadband networks, in addition to voice communication.<sup>1</sup>

Broadband also strengthens public safety networks. Blending satellite, fiber-optic and cellular networks decreases the chances of first-responders from being cut off from a secure communication link. Furthermore, a patrol car or fire truck can be converted into a local mobile control center, enabling information to be sent to other officers and locations through local area networks, which could minimize the impact of any lost connections with headquarters. Public-private partnerships are another component of broadband networks and can, for example, allow police to see through cameras affixed outside of banks or other incident sites.<sup>2</sup>

“Any review of major crises such as 9-11 or Katrina shows how much the personal efforts and effectiveness of our nation’s first responders – police, firefighters, emergency medical personnel, and others – are diminished or undermined when the communications infrastructure that supports our efforts fails or is insufficient for the needs of the public safety professionals,” Chief Harlin R. McEwen, Chairman of the Public Safety Spectrum Trust, testified before the U.S. House Subcommittee on Communications, Technology and the Internet.<sup>3,4</sup>

Tragedies such as the September 11, 2001 terrorist attacks highlighted the need to improve public safety communications. Investigations conducted into the World Trade Center attack in New York City concluded there were communications breakdowns between commanders and first-responders and also between fire and police departments.<sup>5</sup> Such emergencies have spurred deployment of public safety



APPLICATION  
**NOTE**

broadband to prevent similar breakdowns in the future.

New York City's Department of Information Technology and Telecommunications (DoITT) recently launched a new broadband network. The New York City Wireless Network (NYCWin) officially became operational across the city's 300 square miles in May 2009. New York City worked with a leading global security and defense company to deploy the network, using antennas manufactured by PCTEL for parts of the project. NYCWin provides interoperability across different agencies, faster data transmission and capabilities such as streaming video using a wireless Internet Protocol (IP)-based network on the 2.2-2.9 GHz Spectrum. "NYCWin will provide robust, reliable and resilient data communications, enhancing coordination and ensuring that critical information reaches our mobile workforce, to the benefit of all City agencies and the people we serve," DoITT Commissioner Paul J. Cosgrave stated after the network was launched.<sup>6</sup>



*BMAXC233805 with broadband coverage of public safety applications*

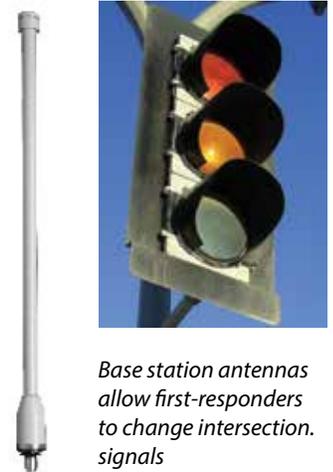
Through NYCWin, first-responders on the move can enhance their situational awareness by laptop access of large file transfers such as video of an incident site, mug shots, fingerprints, maps and more. For example, NYCWin's Interoperable Video Management System (IVS) captured images of U.S. Airways Flight 1549 landing in the Hudson River in January 2009. The NYCWin network is private and secure two highly critical elements should a major emergency put stress on communications networks.<sup>7</sup>

Several PCTEL products have been used to help build NYCWin. These include 2.4 GHz mobile antennas with 5 dB gain (BMAXC24505) and 3dBi gain (BMAXC24503) installed on fire trucks and on police cars, respectively. These antennas are

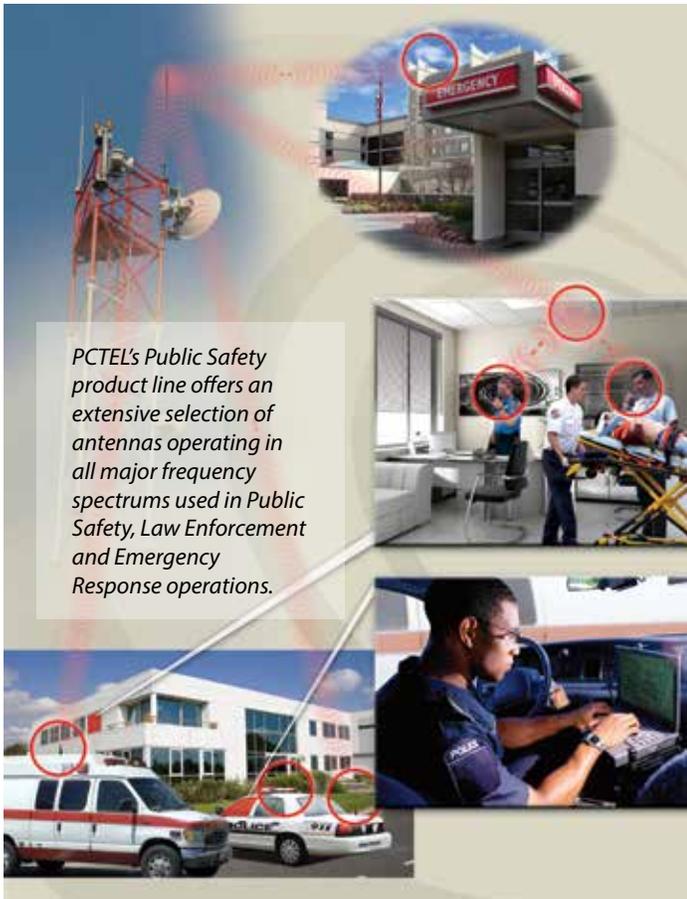
attached to vehicles with permanent mounts manufactured by PCTEL. A PCTEL 2.4 GHz omnidirectional base station antenna helps control traffic lights, so first-responders can change intersection signals. It was built by PCTEL specifically for NYCWin.

The same network that provides information to New York City's emergency responders is used for a host of other purposes. An estimated 100,000 city households had remote readings of water meters through NYCWin as of October 2009, providing more accurate readings, earlier detection of leaks, and reducing the need for manual inspections. The Advanced Meter Infrastructure (AMI) project is estimated to save \$3.5 million in meter reading costs once fully implemented, in addition to savings from water conservation. Efforts are also in progress to use NYCWin to track the city's vehicle fleet, which will reduce gas consumption and other costs.<sup>8</sup>

While cities and other governments are building local networks, the federal government is also taking action to improve broadband infrastructure. Although the D Block of the 700 MHz Spectrum was not auctioned to a commercial partner by the Federal Communications Commission (FCC) in 2008, the push continues to create a national public safety broadband spectrum in order to help rural areas and under-funded municipalities.<sup>9</sup> Stimulus funding, or the American Recovery and Reinvestment Act (ARRA) of 2009, might help to accelerate the creation of public safety



*Base station antennas allow first-responders to change intersection signals*



*PCTEL's Public Safety product line offers an extensive selection of antennas operating in all major frequency spectrums used in Public Safety, Law Enforcement and Emergency Response operations.*

broadband networks, with approximately \$7 billion allocated for expanding broadband services.<sup>10</sup>

Broadband applications for public safety have enormous potential to help first-responders provide protection. These networks are changing public safety communications from a confederacy of different networks to connected systems that offer improved inter-agency communication. In addition, information such as video and other images and data can be transmitted via broadband and sent faster and more reliably. Used in networks such as NYCWin, PCTEL antennas and other products are an essential part of the growing movement toward public safety broadband communications.

## REFERENCES:

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- 3 House Subcommittee on Communications, Technology and the Internet, September 24, 2009: [http://energycommerce.house.gov/index.php?option=com\\_content&view=article&id=1748:a-national-interoperable-broadband-network-for-public-safety-recent-developments&catid=134:subcommittee-on-communications-technology-and-the-internet&Itemid=74](http://energycommerce.house.gov/index.php?option=com_content&view=article&id=1748:a-national-interoperable-broadband-network-for-public-safety-recent-developments&catid=134:subcommittee-on-communications-technology-and-the-internet&Itemid=74)
- 4 The Public Safety Spectrum Trust (PSST) is a non-profit organization dedicated to coordinating a national public safety broadband spectrum on the 700 MHz D Block (<http://www.psst.org/index.jsp>).
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- 6 <http://www.nyc.gov/html/doiit/html/home/home.shtml>
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- 10 Schatz, Amy. "Broadband Stimulus Up For Grabs." Wall Street Journal, April 14, 2009: <http://online.wsj.com/article/SB123976018012019527.html>



## Custom, Application-Specific Antenna Designs

As a leading supplier of antennas for wireless mobile and fixed networks, PCTEL utilizes the latest technologies and engineering design tools to create high performance products to support Mission Critical communications worldwide. For over 30 years, PCTEL's base station, mobile and portable antennas and accessories have been used for Public Safety, Emergency Response and Fleet Management applications by National and International Security and Emergency Response agencies.

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PCTEL, Inc. is a customer-focused company dedicating its research and development to create high performance antenna products to meet market needs.

