

## What is . . . Mission Critical Push-to-Talk?

As public safety begins to use the FirstNet wireless network being built by AT&T, many first responders are asking when Mission Critical Push-to-Talk (MCPTT) will be available. Anyone who has used a two-way radio system is utilizing Push-to-Talk communication. In a PTT system callers take turns speaking and listening via push button switching. Cellular systems have adopted PTT which allows someone to turn their cell phone into a walkie talkie with a much wider range.

“The applications and cellular technologies now being offered to first responders represent some exciting new developments in communication,” said Terry LaValley, chair of Vermont’s Public Safety Broadband Network Commission. “However, first responders need to test the PTT application to make certain that in critical situations the technology performs as needed, especially when cell service is not available. The developing public safety network and its applications are not meant to replace LMR radios, but rather provide an additional means of communication.”

With reliability a key consideration, what makes a PTT application mission critical? In 2011, the Broadband Working Group of the National Public Safety Telecommunications Council (NPSTC) released a paper to provide a common understanding of the meaning of and the multiple requirements of mission critical voice. The working group identified seven essential requirements for mission critical voice. Any system that lacks even one of the requirements would not be considered mission critical voice by the NPSTC.

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**VT Public Safety Broadband Commission**  
Department of Public Safety  
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FirstNet’s mission is to deliver a nationwide broadband network dedicated to public safety to help strengthen their emergency communications abilities, making them safer and more effective on the job. As designated by law, FirstNet was to secure a private partner to deploy the Nationwide Public Safety Broadband Network. Following a competitive RFP in 2017, AT&T was awarded the contract to build, operate and maintain the network.

### VERMONT SUPPORT TEAM

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## VERMONT UPDATE

# FirstNet for First Responders

Department of Public Safety

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## VT Responders Evaluate FirstNet

by Terry LaValley

I want to thank all of those who attended one of the seven regional information meetings on FirstNet. Starting in February, the Department of Public Safety began holding regional meetings to encourage dialogue between first responders and FirstNet and AT&T representatives. The final meeting was held April 30 in Milton. In all, more than 100 people attended the meetings, representing 103 different departments. A common request from first responders was for improved coverage in Vermont and affordable pricing.

No one is required to subscribe to the AT&T FirstNet cellular plans. It’s anticipated that as the broadband network is built nationwide and in Vermont, coverage and applications will grow. AT&T began to market FirstNet subscriber plans in Vermont early this year. Not surprisingly, other carriers are responding by stepping up their marketing. There has been some confusion regarding what AT&T will provide via FirstNet subscriber plans versus other carriers. I’d like to clarify a few points.



**Coverage:** At this point in time, the cellular coverage area in Vermont remains unchanged. Regardless of what cellular carrier you are using, coverage is a first consideration. AT&T is starting an ambitious buildout with the support of designated federal funding from FirstNet. As reported to the Public Safety Broadband Network Commission (PSBC) in April, AT&T is working on 30 Vermont FirstNet sites, plus more business-as-usual sites, at the same time. The 25-year contract FirstNet has with AT&T requires the company to complete the initial buildout by 2022. You should remain alert to new developments in your area.

**Band 14:** Band 14 is a part of the 700 Mhz spectrum. Within that spectrum are bands that are licensed by the FCC to various vendors. Congress specifically licensed the Band 14 spectrum to FirstNet. As FirstNet’s private partner, only AT&T has the right to use this spectrum and will be incorporating it into their overall network as they enhance their existing infrastructure and build new towers. In the future, AT&T may offer features and applications specific to Band 14. FirstNet approved devices that operate on the 700 Mhz Band 14 spectrum are starting to be released. Regardless of the carrier you use, the development of new technology will open the door to more communication options for first responders.

**Subscriber Plans:** Anyone who currently serves in a first responder role is eligible to sign up for a FirstNet subscriber plan. A primary user is any public safety organization/individual whose primary mission and job function is to provide services to the public in the area of law enforcement, fire protection

*(Story continued pg. 3)*



**Terry LaValley**  
FirstNet Single Officer  
& PSBC Chair

*FirstNet is mandated by law to integrate with NG911 and provide the capacity to move data files, including photos and videos, from the public to the first responder.*

- FirstNet & NG911

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There’s more information at  
[www.PSBC.Vermont.gov](http://www.PSBC.Vermont.gov)





## FirstNet and NG911: Technology Changes in Emergency Communications

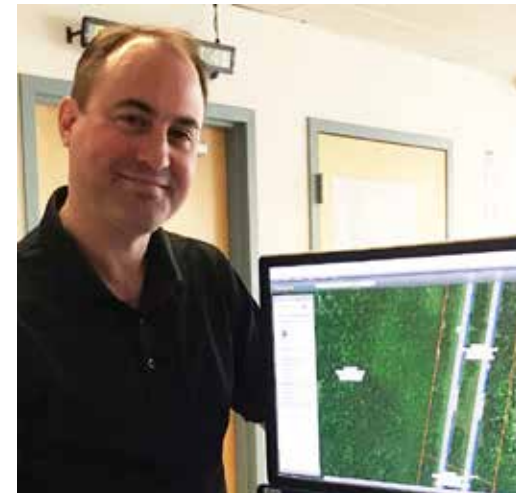
FirstNet is mandated by law to integrate its efforts with the ongoing rollout of Next Generation 911. Emergency communications officials believe the expansion of broadband networks, through the FirstNet build-out, will provide better access and help with leveraging the capabilities of Vermont's NG911 system.

"It's important that in our NG911 evolution that Vermont is well positioned to communicate with Vermonters in a manner they are accustomed to," said Barb Neal, executive director of the E911 Board and a member of the Public Safety Broadband Network Commission (PSBC). "The benefits of enhancing the state's cellular services in underserved areas of Vermont is emphasized by the increasing number of 911 wireless based and texting calls we receive. As the FirstNet build-out progresses, our hope is that broadband connections in those areas will become more reliable."

The move toward NG911 began a decade ago. Congress passed the New and Emerging Technologies 9-1-1 Improvement Act in 2008 that recommended a national plan for migrating to a national IP-enabled network. From a technical standpoint, NG911 networks have two essential elements: the ability to receive, process and share digitized information (including Enhanced 911 calls) from any networked communications device; and the ability for individual Public Safety Answering Points (PSAPs) to seamlessly connect to one another.

Vermont was one of the first states to implement a NG911 system statewide. In 2007, Vermont put into operation a statewide Emergency Services IP network (ESInet) that connected all of the state's regional PSAPs to each other. This interconnectedness ensures 911 calls are automatically routed to other PSAPs should one PSAP be unable to answer a call. Enhanced 911 capabilities are constantly being upgraded in Vermont and in other states. E911 capable systems automatically provide dispatchers with the location of a call. However, when it comes to wireless calls, identifying the precise location of a caller can be challenging without adequate broadband coverage.

Vermont State Police Communications Commander and PSBC member Tom Hango believes that with better cellular coverage in the state will come better response. He oversees two of Vermont's regional PSAPs located in Williston and Westminster. In terms of call volume, these PSAPs process the largest number of 911 calls made in the state, including more than 106,000 wireless calls last year. Jim Cronan is the PSAP Administrator in Williston and agrees improved coverage will make a difference.



Williston PSAP Administrator Jim Cronan stands by a phase two map that shows the location of a wireless caller. Dispatchers may ask a caller about nearby landmarks to confirm a location.

"We have adapted to the increasing number of wireless calls," said Cronan. "If there is adequate coverage, a phase one map will come up that shows a shadowed area of coverage near the closest tower. Next, a phase two map comes up that pinpoints the location of the call. A dispatcher then verifies with the caller where they're located."

While increased coverage is a benefit to the emergency communication systems, it also brings a new challenge regarding how best to process large data files from the public to the first responder. A process must be put in place to determine what video and photos are needed to aid in an emergency response and how it is best transmitted. Questions regarding the security and storage of this information must also be addressed. National 911 professional organizations such as the Association of Public Safety Communications Officials are working on standards to address these challenges.

Overall, such challenges are welcomed by emergency communication officials because it signals that Vermont's cellular coverage will be improving.

"Broadband coverage is vital in our emergency response," said Hango. "As a responder, if the FirstNet system works, I wouldn't have to think about the technology. I can just communicate."



Williston dispatcher Andrea Bushway responds to a 911 call. Last year, approximately 200,000 911 calls were processed statewide.



A phase one map shows the shadowed area of coverage near the tower closest to a wireless 911 caller.

(Responders continued from pg. 1)

or emergency medical services. When a public safety organization subscribes to a FirstNet plan, that organization will provide AT&T with a list of the names of people who serve in a primary role. Once a person's name has been submitted to AT&T, that first responder is eligible to subscribe, regardless of whether the individual is paying his/her own cell phone bill or the organization is paying the bill.

**Pricing:** DPS is currently working with AT&T on a FirstNet services pricing addendum. State of Vermont entities, municipalities, the University of Vermont and the Vermont State College system may use the addendum to purchase FirstNet plan services for qualified public safety subscribers. Departments also may elect to purchase services directly from AT&T.

There are several web sites you can go to for more information on FirstNet in Vermont. DPS provides administrative support for the PSBC.

**PSBC.Vermont.gov:** Commission web site, has links to the FirstNet sites.

**FirstNet.gov:** First Responder Network Authority web site, learn more about developments regarding the nationwide public safety broadband network.

**FirstNet.com:** AT&T web site for subscribers.

My office is available to help answer questions and direct members of Vermont's public safety community to any needed resources. Working with FirstNet, my office will be facilitating more outreach events this year. You may contact us via email at [DPS.PSBC@Vermont.gov](mailto:DPS.PSBC@Vermont.gov) or by calling (802) 241-5535.

## FirstNet Core Launched

This spring's launch of the FirstNet core gives subscribers to the AT&T built network access to new security features and functions. The Evolved Packet Core (EPC) is a framework for providing converged voice and data on a 4G Long-Term Evolution (LTE) network. As the technology partner for the federal First Responder Network Authority, AT&T is building out the high-speed cellular network for public safety. The core operates like the brain and nervous system of the network. Early adopters of FirstNet subscriber plans have had their communication and data traveling through AT&T's commercial core. With the launch of the EPC, public safety traffic now can be separated from commercial traffic and be able to take advantage of the following functions.

- End-to-end encryption to allow public safety users to transmit data securely across LTE enabled devices.
- Creation and control of the FirstNet experience that includes priority and pre-emption calling and contractually mandated quality of service measures to ensure network reliability.
- Around the clock security monitoring of the network.
- Support for mission-critical functions that enables next-generation applications such as Mission Critical Push-to-Talk, enhanced location-based services and more.
- Creation of local control functions that allow incident commanders and eligible first responders to unlock different levels of priority to ensure that needed personnel are able to communicate in an emergency situation.

The launch of the core will not change a public safety subscriber's access to the spectrum bands now commercially available to AT&T customers. Using a FirstNet SIM card, the EPC will apply the new security and functions without limiting the bandwidth the voice and data will travel on. AT&T pledged this "all bands" approach in reaching its 25-year agreement with FirstNet. This is enabling the rollout of the public safety network much more quickly than if it was confined to a single bandwidth, such as Band 14. A SIM, or subscriber identification module, is a smart card inside a mobile phone that carries an identification number unique to the owner, stores personal data and prevents operation if removed.

Only AT&T can implement Band 14. The original law creating FirstNet allocated portions of the nationwide 700 Mhz spectrum, Band 14, and \$7 billion for construction of the public safety network. As FirstNet's private partner, AT&T will also build-out Band 14 and increase coverage and capacity for first responders in every state and territory, including rural areas. All network functions and developments by AT&T must be certified by FirstNet to ensure accountability and performance. The FirstNet core will continue to undergo testing and validation of the overall performance and resiliency of network components. AT&T will begin to move FirstNet subscribers to the new core in the coming months.

(Mission Critical PTT continued from pg. 4)

- **Direct or Talk Around:** This mode of communications provides public safety with the ability to communicate unit-to-unit when out of range of a wireless network or when working in a confined area where direct unit-to-unit communications is required.
- **Push-to-Talk (PTT):** This is the standard form of public safety voice communications today – the operator pushes a button on the radio and transmits the voice message to other units. When they are done speaking they release the Push-to-Talk switch and return to the listen mode of operation.
- **Full Duplex Voice Systems:** This form of voice communications mimics that in use today on cellular or commercial wireless networks where the networks are interconnected to the Public Switched Telephone Network (PSTN).
- **Group Call:** This method of voice communications provides communication from one-to-many members of a group and is of vital importance to the public safety community.

- **Talker Identification:** This provides the ability for a user to identify who is speaking at any given time and could be equated to caller ID available on most commercial cellular systems today.
- **Emergency Alerting:** This indicates that a user has encountered a life-threatening condition and requires access to the system immediately and is, therefore, given the highest level or priority.
- **Audio Quality:** This is a vital ingredient for mission-critical voice. The listener MUST be able to understand without repetition, and can identify the speaker, can detect stress in a speaker's voice, and be able to hear background sounds as well without interfering with the prime voice communications.

To read the NPSTC Broadband Working Group report in its entirety, go to [www.NPSTC.org](http://www.NPSTC.org). Click on the library heading at the top of the page. Select NPSTC reports. Scroll down to Technology and Broadband. Look for Mission Critical Voice Communications Requirements for Public Safety (August 2011).