

MCP

REVOLUTIONIZING PUBLIC SAFETY COMMUNICATIONS

Mission Critical Push-to-Talk Solutions on FirstNet



INTRODUCTION

FirstNet®, grew out of the communications failures exposed after the Sept. 11 terrorist attacks. First Responders could not communicate, and many lost their lives. In addition to building and maintaining a network for first responders, the FirstNet mission has been to create a standards-based interoperable solution for First Responders.

That's why we've worked with public safety to create Mission Critical Push-to-Talk (MCPTT) solutions for FirstNet.



COMMUNICATION CHALLENGES IN PUBLIC SAFETY

Land Mobile Radio (LMR) has been the definition of collaborative communication for over 80 years. To this day, many agencies invest solely in LMR systems to communicate during emergencies. However, relying only on LMR comes with challenges and limitations. Some of these include the **limited coverage area** of LMR, its inability to **interoperate** with other systems, its **lack of capacity** to handle high volumes, and the **cost and control of system configuration**.



LMR systems are location-specific, which means communication is only possible within the coverage area. When responders move outside that area, they are unable to communicate effectively.

In an emergency, responders from different disciplines and agencies need to communicate with each other. And interoperability has been a significant challenge. LMR systems often are unable to facilitate this type of communication.

During large-scale emergencies or disasters, LMR systems may not have enough capacity to handle the high volume of communication traffic. This can lead to delays or missed communications, which can put lives at risk.

Finally, deploying LMR systems is expensive and expanding coverage areas can be cost-prohibitive.



“...modernize this trusted and familiar platform by adding video, location and data services.”

BACKGROUND

Today, LMR remains the original group communication tool, empowering field personnel, administrators, and dispatchers to share information across their areas. MCPTT solutions for FirstNet take the LMR foundation forward and modernize this trusted and familiar platform by adding video, location, and data services. These solutions help establish reliable and secure talk groups within agencies and between them, across cities and counties, for a truly coordinated mobile response.

By unifying their LMR and wireless platforms with MCPTT solutions, users can talk using the right device for them. These users can also stream video, locate other team members, as well as send images and annotated files. Think about the number of texts, videos, and chats you send and receive on a daily basis compared to the voice calls you make.

MCPTT makes public safety more effective as it enables the next generation of First Responders to communicate today and adapt for the future.

Collaboration doesn't only mean PTT group communication. It also means you can use existing communication infrastructure, policies, and procedures as the foundation. Agencies already have legacy PTT infrastructure as well as command and control systems for dispatch, call logging, and other services.

Capabilities of MCPTT

Today's mission critical platforms must improve upon – and not simply replace – existing technology. As such, they must interoperate with various LMR systems and protocols so that First Responders can still use two-way radios to speak with team members who may prefer PTT on their smartphone. Today's mission critical platforms must also be familiar. MCPTT solutions on FirstNet offer a mission critical standards-based ecosystem from the FirstNet core to the end user equipment, delivering the performance and usability public safety requires for voice, data, and video collaboration.

MCPTT solutions deliver end-to-end low latency that meets or exceeds the globally accepted set of features and capabilities per the 3GPP standard for call access time (< 300ms). And the FirstNet Mission Critical Quality of Service (QCI) parameters provide priority to mission critical communications, whatever the situation.

MCPTT solutions **emergency calling and alerting** provides public safety users with elevated priority for group calling in life-threatening situations. In addition, MCPTT solutions have the highest-level priority voice service on the network other than mandated emergency calling.

MCPTT solutions support communication in large entertainment or sporting venues, as the network dynamically adjusts to deliver MCPTT despite network congestion or talk group size, both within a cell and within the core network. MCPTT solutions meet mission critical

performance capabilities. Consumer-grade broadband push-to-talk services offer features tailored for public safety but only deliver a “best effort” approach. This results in an unpredictable experience for First Responders because they can't get near instant call setup and needed network resources. With MCPTT solutions, call setup times rival those of Land Mobile Radio.

“... DELIVERING THE PERFORMANCE AND USABILITY PUBLIC SAFETY REQUIRES FOR VOICE, DATA, AND VIDEO COLLABORATION.”

Control with MCPTT

One of the key objectives of Mission Critical Push-to-Talk solutions is to emulate public safety two-way radio features and layer on valuable broadband capabilities to improve the communication and information available to first responders. That's why agency administrators control virtually every aspect of MCPTT solutions for their users.

The services included in broadband MCPTT are voice, location services, video sharing, messaging, and file sharing. Agencies may

FIRSTNET

MISSION CRITICAL

PUSH-TO-TALK



When your communications are mission critical

DESIGNED WITH **PUBLIC SAFETY** IN MIND:

/ CAPABILITIES >

Reliable voice, data and video-group communication with highest level of traffic prioritization* on the FirstNet network.

/ COVERAGE >

Nationwide coverage on the only public safety network built with and for public safety – expanding beyond the limits of LMR systems.

/ CONSISTENCY >

Enhanced services based on LMR principles, consistent performance and access to the FirstNet Response Operations Group.

/ COLLABORATION >

Modernizes LMR and facilitates your ability to work with your teams mutual aid requests and inter-platform communication.

/ SECURITY >

Geo-redundancy for performance and reliability and a 24/7 Security Operations Center to monitor the network.

/ CONTROL >

Administrators have full control to delegate resources, share information and improve access across agencies through two-way radio emulation.

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*Other than mandated emergency calling



use any or all of these capabilities. They can control all of this through the **FirstNet Central administration portal**, accessible through a browser, from a vehicle, command center office, or device.

This is especially important in emergency situations, where every second counts. For example, in the case of a lost child, incident command can send a picture of the child through MCPTT and get it quickly to the right people.

MCPTT administration tools allow the agency to control features and permissions to “shape” the service to meet a wide variety of roles and use cases. A single user may be a patrol officer most of the time but can temporarily change roles to provide parade security, for example. These roles may require different profiles that define talk groups, contacts, and the features needed to perform that specific job.

Managing features and user permissions is an important component in tailoring the service. Agencies can control these feature permissions, which determine what the end user can access and how they may engage with team members.

Service administration is designed to integrate into the operation of the agency and perform changes and updates in near real time over the air. Some agencies prefer a “set it and forget it” approach, while others may want to actively control the service in response to incidents.

Mutual Aid:
MCPTT solutions provide new ways to

collaborate and interact with other agencies. Agencies can share users and create mutual aid talk groups for incidents and planned events. Agency administrators control the level of participation by the agency. They can share users with other agencies, aid request users from other agencies for aid, and approve specific users for participation with other agencies requesting aid.

Agency administrators operate within a span of control or set of users. The lead administrator determines the span. The agency can disseminate responsibilities throughout the organization, allowing for smaller group autonomy and not centralized control.

Collaboration with MCPTT

Public safety organizations need to collaborate to fulfill their mission and protect the public. In fact, collaboration capabilities underpin the National Response Framework (NRF), which is a guide to how the nation responds to all types of disasters and emergencies. The All-Hazards Incident Management Team (AHIMT) concept has significantly improved coordination for medium and large-scale incidents and events. However, public safety’s current communication tools limit collaboration capabilities at these urgent and emergent incidents and events and in day-to-day work because of older technologies still in use.



“SITUATIONAL AWARENESS INFORMS STRATEGIC DECISION MAKING AND IMPACTS THE SAFETY OF BOTH PUBLIC SAFETY PERSONNEL AND THE COMMUNITY.”

Broadband technology like MCPTT solutions can improve public safety’s collaboration capabilities at each level – strategic, tactical and task.

For example, at the:

Strategic Level:

If “a picture is worth a thousand words,” what is video worth when it comes to situational awareness? Situational awareness informs strategic decision making and impacts the safety of both public safety personnel and the community. For example, if an incident commander sees untenable positions because of fire growth, hazardous materials, vapor clouds or even an active shooter location, seconds matter when making the call to operate offensively or defensively. LMR systems currently limit communications to verbal and one person talking at a time. MCPTT enables data and video – robust situational awareness tools for public safety.

Tactical Level:

Special Assignment Units (SAU) and SWAT teams move fast to protect citizens and rely on each other when making entries. Near real-time location tracking enabled by MCPTT broadband gives commanders in the field a common operating picture. The answer to the question, “Should I go left or right?” can have mortal impacts. So the location information that comes with MCPTT is critical. Locating and navigating to a lost child or away from a suspicious package requires knowing the location

and being able to navigate to it.

Task Level:

Sometimes public safety operators can’t talk and call for help without compromising their position or their intent to call for help – or simply because they can’t breathe. MCPTT enables transmitting calls for help with location in ways that LMR cannot.

Interoperability:

In addition, MCPTT allows collaboration by bringing all the various technologies together. By connecting an LMR environment to the MCPTT environment, system administrators and agencies can extend the capabilities of LMR, the coverage, capacity, and collaboration capabilities.



Coverage with MCPTT

In addition to the 20 MHz of Band 14 spectrum set aside for public safety for the buildout of the nationwide network, FirstNet uses all AT&T commercial bands to provide priority, preemption and mission critical services for first responders. FirstNet has continued to expand coverage for first responders in rural areas where public safety said they needed coverage.

FirstNet offers over 2.91 million square miles of coverage – over 250,000 square

miles more than any commercial network. Using this nationwide network for mission critical communications provides many operational benefits to public safety. MCPTT solutions give first responders immediate access to nationwide coverage – extending the limits Land Mobile Radio.

Historically, when public safety officers responded to a mutual aid request outside their normal area of operations, they had challenges with communications. Using MCPTT solutions helps extend the typical LMR coverage footprint and reduces the amount of time spent programming radio systems and radios. It helps ensure First Responders can communicate and interoperate with existing LMR systems anywhere in the country.

The choice in your software application can have a profound effect on your experience. Any application can work in normal times. But it's those tough times that separate a regular application from a mission critical application.

Agencies on FirstNet also have the ability to request portable network cell sites when needed – and they can even purchase some sites, giving them the ability to deploy and control when needed.

Compact Rapid Deployables are portable cell sites that agencies can purchase and deploy as necessary at critical incidents. They've been instrumental in First Responders' emergency response during

wildfires, storms, and hurricanes such as [Hurricane Ian](#).

In addition, FirstNet launched the Mini Compact Rapid Deployable for FirstNet. The miniCRD™ is [now available](#) for public safety agencies to purchase. These agency-owned assets are 80% smaller and half the price of the CRD™ for FirstNet. The miniCRD™ consists of 2 ultra-portable ruggedized cases – each about the size of checked luggage. It covers up to a half mile, links to FirstNet via satellite without relying on commercial power availability, and a single person can deploy it in minutes.

FirstNet has built a core network focused on public safety. In fact, FirstNet now connects more First Responders than any commercial network. This combined with Band 14 spectrum specifically set aside for public safety allows FirstNet to offer a more reliable, flexible, and powerful experience for all the changing conditions First Responders face.

“FirstNet to offer a more reliable, flexible, and powerful experience for all the changing conditions first responders face.”



SECURITY & RELIABILITY

on MCPTT

We have engineered and deployed the MCPTT solutions with geographic redundancy and diverse connectivity between sites. We are working tirelessly to ensure we meet the performance and reliability requirements for public safety.

MCPTT solutions are unlike any other push-to-talk broadband offering – they’re built into the FirstNet Core. And with security protocols – such as comprehensive tower-to-core encryption, voice encryption, and database encryption – public safety can trust that its communications are highly secure. Plus, the FirstNet Security Operations Center monitors the network 24/7/365 to guard against physical or cyber threats, providing additional security and protection. And it does so with backing from AT&T - a leader in cybersecurity, threat detection, and remediation - so you know your data is safe.

The Future of PTT in Public Safety

MCPTT solutions are not just for voice communications. They include data, location services, and video capabilities.

This means users can talk and send maps, pictures, and other critical information to help fellow First Responders navigate emergency situations more effectively.

FirstNet also is working to further develop LMR-LTE interoperability via the standards-based Inter Working Function (IWF). This includes Inter Sub System Interface, Console Sub System Interface, Digital Fixed Station Interface – protocols that help provide an interoperability solution.

FirstNet technologies already support some of these key public safety protocols. We also support (RoIP) to ensure maximum compatibility with existing networks.

This level of situational awareness has not been possible with other communication solutions in the past. And we will continue to work with the First Responder Network Authority to innovate as the needs of public safety evolve. We want to ensure first responders have reliable, secure connectivity – and the very best technology – when and where they need it.



To learn more visit:

<https://www.firstnet.com/mission-critical.html>