FROST & SULLIVAN

Push-to-talk Over Cellular:
The Next Generation for Land Mobile Radio

A Frost & Sullivan White Paper

INTRODUCTION

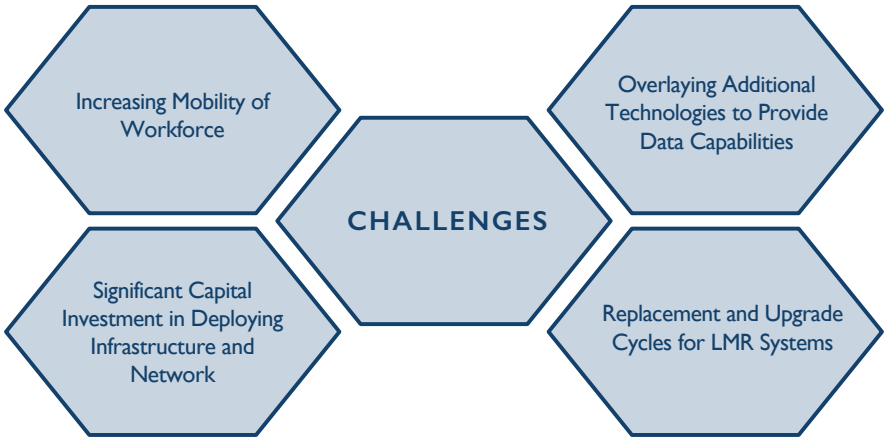
Land Mobile Radio (LMR) has long been the preferred communication network for a variety of industries that dispatch vehicle fleets or have mobile workforces including public safety as well as construction, utilities, hospitality and transportation. Over the years, these systems have evolved from traditional two-way radios and walkie-talkies to now operating over IP and cellular networks.

One of the limitations of traditional LMR systems is the coverage of the networks. The short range frequencies for private radio require users to be in range for traditional radios to work. While customers may link together the digital trunked systems to increase coverage, the capital investment of deploying such an extensive infrastructure can be substantial. Push-to-talk over Cellular (PoC) removes this limitation and gives users almost unlimited range (national and even international coverage) without the need to develop and maintain a costly and complex network. In addition, the use of existing mobile devices can help organizations and governments save money and reduce their total cost of ownership (TCO) versus using LMR solutions.

The objective of this paper is to educate organizations and governments on the benefits of using PoC solutions over traditional LMR systems.

CHALLENGES FOR TRADITIONAL LMR SYSTEMS

There are some significant benefits to evolving to a new technology. To understand the benefits, we must first explore some of the challenges vendors and service providers face in providing LMR services. Carrier-grade PoC solutions help alleviate many of these challenges faced by users of LMR systems. While each deployment has its own set of challenges, Frost & Sullivan has identified these four (4) challenges that affect a majority of users.



Source: Frost & Sullivan

SIGNIFICANT CAPITAL INVESTMENT IN DEPLOYING INFRASTRUCTURE AND NETWORK

The CAPEX (capital expense) necessary to deploy a radio network for LMR systems can be significant, ranging from hundreds of thousands to millions of dollars. In addition to the cost, there are time requirements that should be recognized. Developing a network can take weeks, months, and in some cases years, based on the complexity of the solution. However, with a PoC solution the burden of deploying the network rests with the underlying carrier, which deploys and manages networks as part of its daily operations. Thus, with nationwide cellular networks already in place, organizations and government agencies can deploy a PoC solution quickly with little capital investment.

OVERLAYING ADDITIONAL TECHNOLOGIES TO PROVIDE DATA CAPABILITIES

Traditionally, two-way radios and LMR systems can only be used for voice communications across a private network. Typically, any transmission of data would require a second, separate mobile device (such as a smartphone) and service on another network (since data cannot be transmitted across the LMR network). The use of PoC solutions helps alleviate the need for multiple devices by providing voice, text and data capabilities on a single device. In addition, PoC devices can be ruggedized for use in all work environments, just like their two-way radio counterparts.

REPLACEMENT AND UPGRADE CYCLES FOR LMR SYSTEMS

The typical life of LMR devices ranges from 5 to 7 years. LMR infrastructure and networks usually go through upgrade cycles every 10 to 15 years. While LMR devices typically have a longer lifecycle than PoC devices, the cost of LMR devices is significantly higher. The cost of upgrading outdated analog infrastructure and LMR devices can run in the millions of dollars and put a tremendous burden on organizations and government agencies that deploy and maintain LMR networks. This level of expense can now be reduced or avoided by replacing existing LMR infrastructure with PoC solutions.

INCREASING MOBILITY OF WORKFORCE

The increasing mobility of today's workforce, coupled with the popularity and proliferation of mobile computing devices, has brought mobile worker applications to the forefront. Employees want to leverage the convenience of mobile apps. Companies want to harvest the productivity benefits. Current LMR systems are limited in their ability to support mobile data applications, thus forcing customers to manage multiple devices and networks. PoC solutions help remove that complexity by enabling a customer to consolidate to a single device platform and deploy mobile applications to increase productivity and drive efficiency in its workforce.

FEATURES COMPARISON BETWEEN TRADITIONAL LMR SOLUTIONS AND PoC SOLUTIONS

Traditional LMR solutions have a wide range of functionality for users and managers/dispatchers. In many deployments, LMR systems represent mission- and business-critical services. For instance, in a construction environment, these systems are essential for communication between project managers and foremen. In these and other situations, timely and effective communication can increase productivity and profitability (and in some cases, keep workers safe). This requires sub-second call setup and superior call quality. These have been features that defined the use of LMR systems. Carrier-based PoC solutions have now advanced to match – and in many cases expand - these features. In this section, we will compare the traditional features of LMR systems with the enhanced functionality of carrier-based PoC solutions. There are Over-The-Top (OTT) Push-to-Talk solutions that overlay the cellular network but are not integrated or optimized. These solutions utilize the Internet as a means to access the carrier network like any other 3rd party data application – without being subject to any quality of service (QoS) criteria.

Only carrier-based PoC solutions can provide the QoS and response times that mimic those of traditional radios, all while increasing the coverage nationally and in some cases, internationally.

	Carrier-based PoC Solution	LMR Systems
Handset OS supported	iOS, Android, Windows, embedded; smartphones, tablets, phablets.	Proprietary
Ruggedized handsets, including intrinsically safe	Available	Available
Accessories	Yes (wide portfolio)	Yes
Corporate admin. tool for contact & group mgmt.	Yes (allows an admin to manage contacts & groups, synched to PTT clients in real time & OTA)	Programming tool cannot synch groups to radios wirelessly in real time
Auto pairing	Auto loading of up to 50 PTT contacts in same co.	No
1:1 calls & group calls	Yes	1:1 call very resource inefficient
Ad hoc group call	Yes (user can select multiple contacts and then immediately start a group call)	No
API for 3rd-party apps	Yes	No
Presence	Yes (Available, Do Not Disturb, or Unavailable)	No
Prioritized group scanning	Yes	Yes
Broadcast calling	Yes	Yes
Late join capability	Yes (allows user to join group call after it starts)	Yes (some systems)
Supervisory override (allows the supervisor to take the floor any time)	Yes	Yes
Call-me alert	Yes (alert to contacts with DND status)	Yes
Text and multimedia messaging; location tracking	Available	Limited
Security	AES 256 and FIPS140-2 Level 1	Depends on system & application
Dispatch console	Integrated solution	Yes
LMR/cellular interoperability	Yes - wireless (donor) and wireline (IP)	With separate equipment

Source: Frost & Sullivan

As highlighted in the table above, carrier-based PoC Solutions have significant feature advantages over LMR systems while alleviating the challenges faced by such systems. In addition to national or international coverage with Wi-Fi and cellular, managers and dispatchers have enhanced capabilities to track specific employees and set up alerts to contact them when available. These features expand the utility of PoC solutions in vertical applications where LMR systems have not traditionally been deployed.

TOTAL COST OF OWNERSHIP (LMR VS. PoC)

LMR deployments using two-way radios are typically very capital-intensive and include additional operational cost components not required by PoC solutions. On the front end, LMR deployments require user organizations to build a narrow band, short range wireless network to enable communication between radios. Depending on the number of devices, the cost of building a network can range from hundreds of thousands to millions of dollars. In addition, two-way radios can cost between $700 and $ 7,000 each. When deploying a system with hundreds or thousands of radios, the costs add up quickly. And this does not take into account the costs of value-added services, maintenance, device replacements and system upgrades. When all of these components are added, the total cost of deploying an LMR system can run into the tens of millions of dollars. For military or government deployments that use P25 or TETRA radios, the costs can increase tenfold.

As a comparison, with PoC solutions, organizations can completely eliminate the front-end capital outlay, because there is no need to build a network. Organizations can deploy PoC solutions quickly on existing 3G, 4G or 4G LTE networks. In addition, managers have the choice of purchasing new devices or using existing smartphones with push-to-talk applications. The cost of service ranges from about $5 to $10 per user per month, and dispatch units can be setup for approximately $30 per dispatcher per month. The total cost of deploying a PoC solution with hundreds of users could be as low as 5 to 10 percent of the cost of a traditional, two-way radio LMR solution.

Cost Comparison between Traditional LMR and PoC Systems

Cost Elements	Traditional LMR	PoC Solutions
Network Development & Rollout	Hundreds of Thousands to Millions of Dollars	$ 0
Cost of Devices (per user)	$700 - $7,000	$300 - $800
Device subsidies available with multi-year contracts	No	Yes
Dispatcher or Manager Dashboard and Communication device	Costs vary but run in thousands of dollars	$30 per dispatcher unit

Source: Frost & Sullivan

ADVANTAGES OF CARRIER-GRADE PoC SOLUTION OVER OVER-THE-TOP PTT APPS

Over-the-Top PTT applications have gained some traction in the past 2-3 years. However, these applications are significantly challenged by inherent weaknesses when compared with Carrier-grade POC solutions. These weaknesses include:

- Limited handset choices, especially when it comes to rugged feature phones
- No low-cost PTT-only plan
- Only Consumer-grade offering
- No carrier network integration
- No carrier-provided service assurance
- No scalable customer support resources, with questionable long-term sustainability
- No feature-rich corporate admin tool for centralized contact and group management

While these applications can be used for deployments that do not require the scale of LMR systems (and cost is a huge factor), they do not represent the next generation of LMR systems. These applications do not solve the challenges faced by LMR systems and do not offer all the benefits of Carrier-grade PoC solutions.

AT&T'S PoC SOLUTION

AT&T is a leader in the emerging PoC market. AT&T Enhanced Push-to-Talk is the next generation of simple, one-touch communication. AT&T offers customers a managed broadband infrastructure to deploy mobile productivity applications while preserving the need for efficient push to talk communications, either 1:1 or group. By combining user-friendly, walkie-talkie-like functionality with advanced features and a voice and data network that covers more than 99% of Americans[1], AT&T's Enhanced Push-to-Talk Service allows customers to:

- View GPS-enabled users and conduct group (or individual) calls through a desktop PC using Integrated Dispatch
- Combine productivity apps and PTT functionality on one device
- Improve operational efficiency—saving time and money
- Integrate with existing two-way radio systems via open standards, IP-based interoperability.

Interoperability is critical to the success of Carrier-based PoC solutions. AT&T's PoC solution follows Open Mobile Alliance (OMA) standards to promote the open standard policy to provide customers with flexibility and better economics. Also AT&T's PoC solution offers scalability, is highly reliable and integrations with its large and secure 4G LTE network, which provides 24/7 monitoring and support.

AT&Ts Managed Broadband-enabled Enhanced Push-to-talk solution includes the following features:

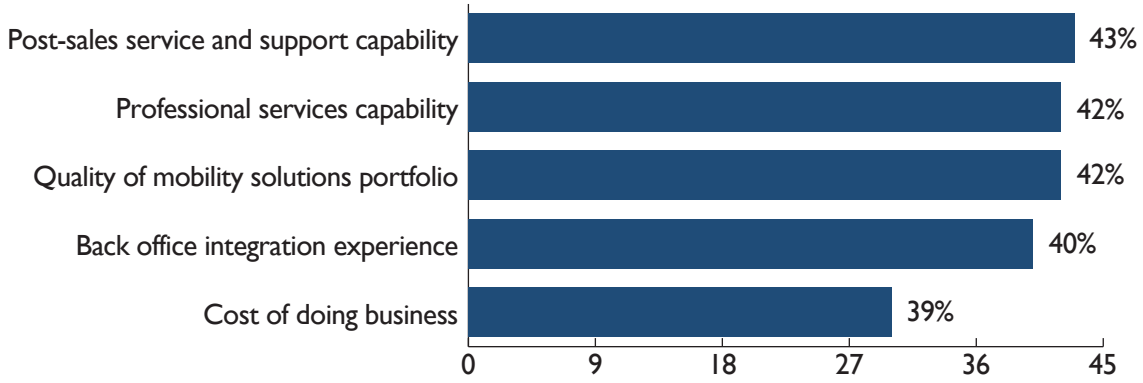
PTT integration with Workforce & Fleet Management Apps via APIs	PTT to LMR Interoperability via IP interfaces
Standards Based Deployment	
Managed Network Extended to Customer Premise	
AT&T Dynamic Traffic Management	
EPTT Optimized for rugged and standard OS devices and accessories	
EPTT optimized for AT&T RAN	Carrier Scale & Reliability
AT&T National LTE Broadband Network	

Source: AT&T

1 Based on coverage in U.S. licensed/roaming areas; compatible device required; coverage not available everywhere

In addition to providing a compelling PoC solution, AT&T also meets other top criteria that are important to North American businesses when selecting a mobility service provider.

Top Mobility Partner Selection Criteria, North American Businesses, 2015



Total Respondents % of "Very Important" Ratings

Source: 2015 Mobile Enterprise Applications Survey; Frost & Sullivan

Today's companies recognize the importance of high-quality post-sale service and support, a comprehensive professional services suite, and deep back-end system integration experience – all areas in which AT&T can add real value to businesses interested in upgrading their mobile field communications capabilities.

The breadth of AT&T's mobile solution portfolio is also an especially relevant factor given the synergies that exist between Push-to-Talk over Cellular and other field services solutions, such as fleet management, business messaging, and mobile workforce management.

As the market for fast, cellular-based push-to-talk communications heats up, businesses should give serious consideration to the high-quality products and services that AT&T can bring to the PoC table. More information on AT&T's offering can be found at www.att.com/eptt.

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