

Mission Critical Communications for Public Protection and Disaster Relief



About us

Cellnex provides mission critical communications services to Public Safety agencies and Emergency services helping its customers to manage their resources and to enable secure communications with their machines and people.

With its managed services staff, Cellnex implements the delivery and deployment of end to end solutions from network infrastructure to terminal devices and enables the support of its customers with professional services for maintenance, upgrades and network event monitoring to keep the network operating at the best level of performance.

More than 20 years of experiences give the company a thorough understanding of the mission critical communications challenges

The Mission Critical Challenges

Public Protection and Disaster Relief agencies need a secure private mobile networks for mission critical communication to perform their operations. These networks should comply with advanced services specifications and should provide a secure and resilient mobile voice, data and video service platform to address these needs.

Cellnex Telecom provides professional radio communication systems for public safety authorities complying all mission critical requirements from the design and engineering of the networks to the end-to-end services for operations and maintenance.

Safety Services Specifications

PPDR networks for Public Safety and Emergency Services require mandatory functional specifications to guarantee safe and secure operations from first responders.

Control

Private communications systems are not subject to accessibility risks, air time billing or service issues that public subscription –based networks are used to. Operational processes of the system and service specifications remain under complete control.

Fast Call Setup

Instant two-way voice communications setup time is essential for a quick response during mission critical operations where decisions should be taken in seconds in order to be efficient in the front-line.

Group Communications

First responders tactical communications and operational policies are based on group communications in their operations to support the fundamental requirement for efficient and dynamic group calls and dispatcher instructions.

Broadband Data

The need for new data based applications and multimedia communications for public safety operations requires a broadband communications system. In case of major incidents, the number of simultaneous active first responders in a limited area can be considerable.

Video Applications

Video based applications in Public Safety improves the effectiveness in Mission Critical operations and the use of video applications evolves to include Push-To-Video for Group Communications.

Mission Critical Network Requirements

Security

Security tools are required to prevent unauthorized access into a mission critical network and user authentication and authorization are contemplated by the standards. Critical communications are secured with encryption systems to avoid intrusion intents.

Coverage

Designed to meet specific requirements, the custom coverage provided in a private network is configured for the unique service needs according to the location of individual users whether it is an indoor warehouse or an offshore oil platform in harsh environment.

Reliability

Reliable communications remain the primary lifeline for first responders. Network reliability is based on high availability and redundancy architecture at all layers of the system. Load balancing between core elements improves the systems reliability and guarantees availability.

Resilience

The resilience features needed in Mission Critical communications networks are defined by the technology design to fulfill the Public Safety requirements. Proximity Services provide an additional level of resilience completed by the Isolated Operations specifications.

Capacity

A private network is engineered to address peak usage using dedicated licensed spectrum and system sizing is designed for specific traffic needs and the existing workflows for user groups communications.

Network Solutions

DMR Systems

Digital Mobile Radio – DMR – is a standard designed specifically for professional mobile radio communications combining the advantages of conventional two-way radios with the benefits of digital technology.

DMR is the solution for an affordable radio communications network providing voice, data and other supplementary services when the standard defines different configurations consisting of Tier II and Tier III according the commercial applications.

TETRA Systems

Terrestrial Trunked Radio – TETRA – is a professional mobile radio specification designed thinking in a secure network for use by law enforcement agencies and emergency services where critical communications and secure two-way voice radios are required for the coordination of the resources and for an efficient management of their people and fleet.

TETRA System is therefore the most chosen solu-

tion for critical networks and for reliable communication where a high availability and security are the requirements for the end-users.

LTE Systems

Digital transformation of businesses and industries brings with all the related new processes, new way to connect information data and to communicate to each other.

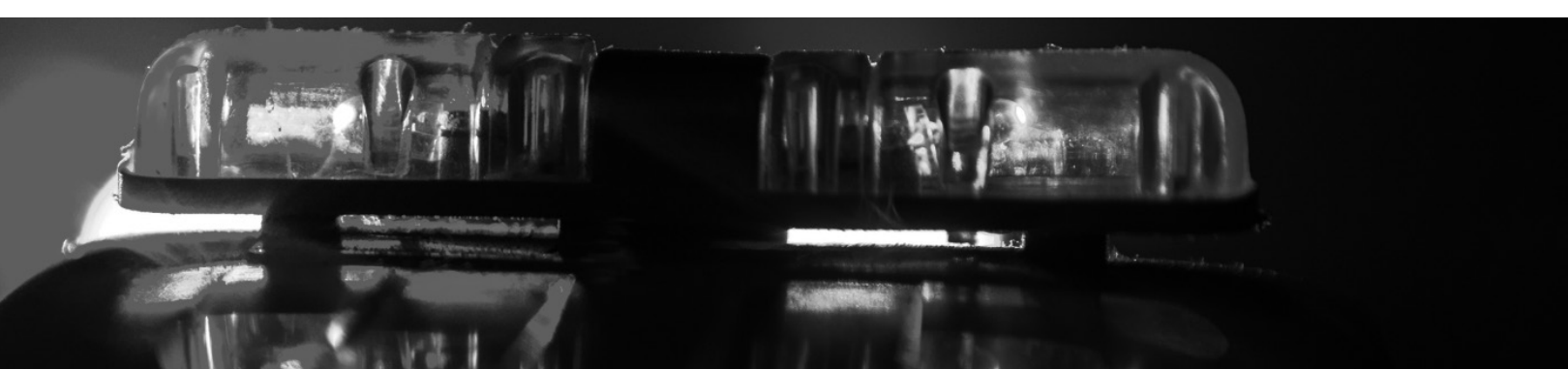
Seeking for efficiency, real-time information and rich multimedia data requires today broadband communications, specific applications and Smart devices.

LTE System is the future-proof solution which answers these specifications ensuring the evolution toward the 5G concept.

The capabilities of LTE networks can be leveraged to provide Mission Critical Communications for Public Safety agencies and Emergency services and to improve their operations allowing first responders to exchange multimedia content in addition to voice enhancing access to mobile broadband data.

Mission Critical Communications Applications

	Text Messaging	Telemetry	SCADA Integration	Control and Dispatch
DRM	Based on the SDS-Short Data Services features, Text Messaging Services provide users a communication tool for individual messages or group messages.	Real time information from sensors are conveyed through the data communications to integrate a remote monitoring system.	Digital radio coverage is used to deliver a data acquisition solution through data transport services that is reliable and secure providing control of assets.	Controlling communications and conducting and dispatching the users across the network is a key application for mobile radio communications.
TETRA	Automatic Vehicle Location	Fleet Management	Voice and Data Recording	Interoperability
	GPS-based location system is used to define vehicle positions and to send real time data through digital radio network for map visualization.	Vehicles location and basic functional data are grabbed for fleet management and optimization purpose using Short Data Services of the digital network.	Voice and data messages recording helps to verify compliance to procedure and to clarify circumstances and issues responses.	Gateways make possible the communications with other networks based on different technologies for a seamless operations for the users.
LTE	Push-To-Talk	Vehicle GPS Tracking	Video Streaming	White Board
	The PTT Voice Communications Service provides users with two-way radio like talk calls with enhanced features for individual calls and group calls	Fleet vehicles are tracked in real-time and routes are identified with the localization features of the system for routes optimization and drivers safety.	The Video Streaming application allows a user to send a video stream for situational awareness and to activate the video stream recording for future access.	A team collaboration tool where image file is shared to all team members onto a white board where freehand drawings and annotations can be added.



Potencial Use Cases

Applications Solutions

Private mission critical networks are designed for voice and data critical communications answering to the needs for group coordination and resources management from Public Safety authorities and Emergency services.

More and more, the users require broadband data and video applications with advanced smart devices seeking for new levels of safety and improved efficiency with real-time information and integrated solutions.

The sharing of data over a broadband network is enabling the first responders to have more information available to complete their mission.

Push-To-Talk applications on smart phones replicate the conventional PTT button for a reliable always-on voice communication and extend this essential communication tool with pictures sharing, video communications and real-time database access.

Integration of Legacy System

These collaborative tools offer the advantage of the conventional mobile two-way radio communications

with the possibility to integrate legacy systems to path the way to a smooth integration of TETRA network alongside of an innovative Mission Critical LTE solution.

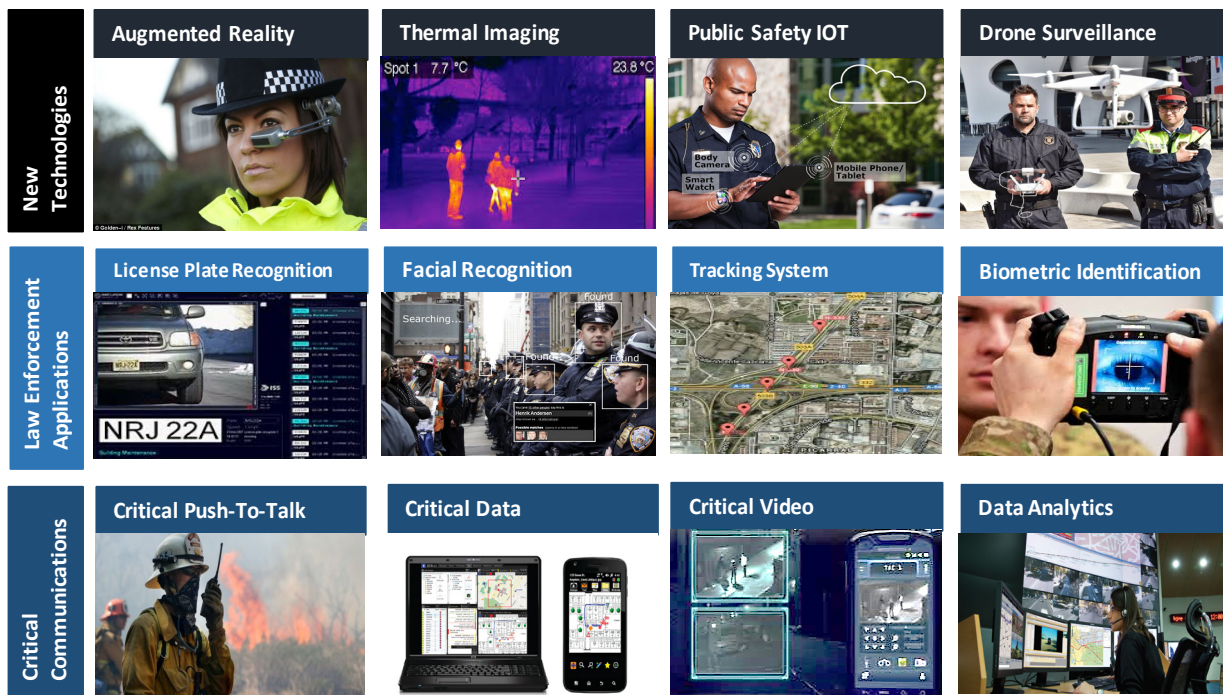
New Technologies

The use of LTE as underlying technology for mission critical opens the possibility for new applications leveraging on the evolution of the standard toward the 5G concept.

A dynamic ecosystem of applications developers provides a highly secure, reliable and interoperable set of applications specifically designed for public safety within a framework of 3GPP standards for mission critical applications.

Innovative solutions available for commercial applications can be adapted for public safety complying all the security and safety requirements for mission critical including several use cases from aerial surveillance missions using drones to augmented reality identification of suspects during crowd management.

Mission Critical LTE Potential Use Cases



Smoothing the Path to Broadband

Hybrid Network

Existing mission critical networks are designed for voice and data communications answering to the needs for group coordination and resources management from law enforcement and emergency services.

New technologies based on LTE standard have the potential to work alongside of legacy technologies like TETRA-based networks : LTE and TETRA can converge to enhance legacy infrastructure ensuring the continuity to existing operational model and avoiding an abrupt disruption to the users. The advantages of taking a hybrid approach to Mission Critical Communications include a reduction in cost with the sustainability of past investments while increasing flexibility with a smooth introduction of new service possibilities for users.

Hybrid solutions for offering mobile broadband for public safety applications enable the management of subscribers from the same system independently of the service provided either for voice and data from the TETRA network or for broadband applications from LTE services. The convergence is performed to connect narrowband and broadband users with shared group communications service.

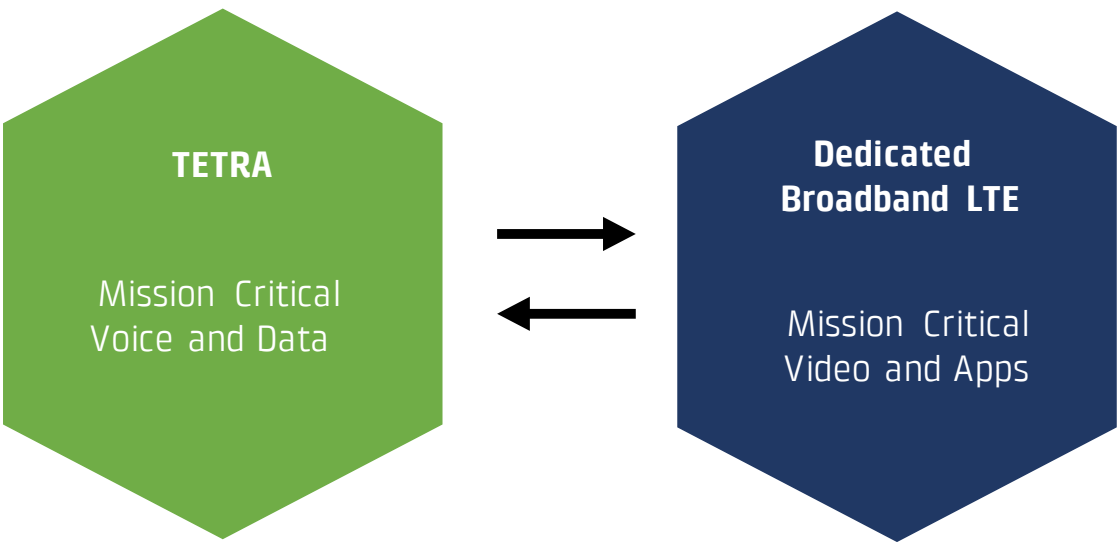
Conclusion

Broadband technologies defined with the evolution of LTE standards represent new opportunities for public safety critical communications.

Added values from mobile broadband leveraging on new applications and innovative use cases bring the public safety operations to a new level of efficiency and safety in their tasks of saving life and helping the society.

Cellnex Telecom with its extensive experience in critical communications provides a clear path that leads to mobile mission critical broadband

Hybrid Mission Critical Communications Network



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