

January 2018



TRANSFORMING BLUE-LIGHT COMMS

ESN puts high-speed data on the frontline for a safer world

The new GBP1.2 billion Emergency Services Network (ESN) will transform mission-critical communications for hundreds of thousands of police officers, paramedics, firefighters, and other public-safety users in the UK. It replaces the TETRA-based Airwave network with integrated critical voice and broadband data services for enhanced, fast, and reliable communications in even the most challenging situations.

Introduction

In a world first for national mission-critical communications for the emergency services, ESN will be hosted on an existing commercial 4G network, making it a cutting-edge digital solution that also saves public money and can evolve in line with technological advances, such as the introduction of 5G.

But ESN is no ordinary 4G network. Its highly resilient dedicated core is enhanced to meet the rigorous demands of its role; coverage is extended beyond the scope of current commercial networks; and public safety traffic is prioritised.

As part of the KBR delivery partner team selected by the Home Office to help deliver ESN, we are supporting the rigorous testing and trials programme to ensure the technically challenging new system is fit for purpose and meets all user requirements before the complex transition begins in 2019. This paper looks at what ESN means for our emergency services and how it will enable improvements in public and staff safety.

What's going to change?

Fast access to reliable data transfer in the field can mean the difference between life and death for members of the public and emergency personnel. The dedicated public-sector Airwave radio network, due to be switched off in 2020 when contracts expire, has been outstripped by advances in technology. In its place, as well as providing mission-critical voice communications, ESN puts high-speed broadband into the hands of frontline crews, giving them the ability to share photos and videos in real time as incidents unfold, and to

connect seamlessly with experts and commanders off-site to allow better informed decision-making.

ESN continues to connect the wider public-safety community on a national platform, enabling joined-up communications between the emergency services and all other users when fast, well-informed response is crucial. It also supports the trend for increased collaboration between the emergency services, for example shared buildings and equipment.

The introduction and roll-out of ESN has wide-reaching implications for all the individual police, fire, and ambulance organisations that make up the UK's emergency services. There are three key components involved in optimising the benefits brought by ESN:

- control rooms
- terminals
- and applications.



Source of statistics: Home Office (February 2017)

4G replacing TETRA

Mobile services provider EE is extending 4G coverage:

- 18 500 sites being upgraded to 4G
- c. 430 new masts in remote regions, increasing UK coverage to 97%
- the Home Office is also providing around 300 new sites in remote areas for use by ESN

Source: EE (February 2017)

Control rooms

Bringing in this new network is a Home Office programme, co-funded by the Department of Health and Scottish and Welsh governments. But successful transition – and exploiting the full potential of ESN – is the responsibility of the independent service organisations.

In control rooms, that is likely to mean upgrading existing solutions such as integrated communication control systems (ICCS), command-and-control systems, and back-office applications. The need to carry out this work offers an opportunity to reassess the overall control room architecture and perhaps introduce a better integrated platform. In North Wales, for example, we have been working with the fire and rescue service (FRS) to upgrade the command-and-control system and ensure it is ready for transition to ESN, as well as assisting with the technical design and deployment of the ICCS

which North Wales Police will share with the FRS.

The introduction of ESN requires immediate changes to dispatch equipment for incoming and outgoing voice calls, but that should only be the beginning for control rooms wanting to reap the wide-ranging benefits offered by ESN.

A high-speed data pipe enables enhancements to existing communications and, with them, improved efficiency, decision-making, and safety.

For example:

- a geolocation system enhanced by real-time data transfer enables more accurate resource information, which in turn means faster response times
- the ability to send still and streamed images to responding units improves situational awareness
- faster access to databases – such as automatic number plate recognition (ANPR), registers of firearms holders, and bottled gas stores – has the power to improve outcomes.

Terminals

The mainstay of the new communications framework will be digital handsets, although these will look somewhat different from the familiar smartphone because they will require enhanced battery capability and must be able to withstand rough treatment. Other terminals will also connect to ESN for quick transfer of different types of data, enabling better decision-making during incidents, wherever they happen.

ESN has the potential to turn every ambulance, fire appliance, or emergency vehicle into a mobile communications hub, offering seamless connection, not only with the command centre, but with other organisations and individuals that could lend specialist help to a specific operation. The vehicle becomes a gateway into the main network, which could prove critical in remote locations where reception may be relatively poor on handheld devices but strong through the antenna on top of the vehicle.

Where life is at stake, ESN can bring expert medical opinion into the field and send detailed advance information – including data such as an electrocardiograph trace – to hospitals ahead of the patient's arrival, allowing the correct team and equipment to be standing by.

Mobile broadband allows the instant transfer of clear images – stills and video – for more nuanced decision-making, whether about what medical steps to take or how best to handle an unfolding incident.

For the police, it puts any senior officer front and centre of the action, enabling a rapid second opinion where required. Personnel on the ground can live-stream high resolution video from body-worn cameras for an immediate remote assessment of the situation and advice on how best to proceed. Without mobile data capability, body-worn video cameras are for evidential purposes: ESN gives them an operational role.

Both the police and fire service can reduce risk by using drones for a bird's eye view of what's happening out of their line of sight. Real-time drone footage might reveal unknown threats

Fast access to reliable data transfer in the field can mean the difference between life and death

and hazards and can help keep frontline emergency teams safe as well as improving the operation's chances of success.

While ESN will not be used for fireground communications – the means by which fire fighters communicate and monitor vital signs when going into burning buildings – it will link the appliance with all outside help and information, including digital blueprints. The system will also go into areas such as the London Underground, ensuring national coverage for the British Transport Police and the other emergency services.

In terms of mobile working, ESN also makes life more efficient, allowing personnel to input 'paperwork' directly from the field rather than having to re-key information on return to base.

Applications

The sky's the limit with applications – with appropriate device management to ensure security. ESN will enable bespoke, discipline-relevant apps for smarter ways of working and improved efficiency across the different services, covering everything from resourcing to shift patterns.

Mobile broadband applications might include

- evidence gathering – seamless transfer of signed statements, images, and video
- fingerprinting
- blood analysis.

How to prepare for ESN

It is down to the individual emergency service organisations to ensure they are ready for ESN transition: to scope out requirements, procure devices, and prepare control rooms. The minimum starting point for ESN is readiness for voice connections – then organisations can decide how to build on that to take full advantage of the benefits and efficiencies offered by ESN. Below are some of the key questions on which to focus.

- What services, processes, and working practices will be affected by this change?
- What equipment and services do you need to buy?
- How much are the changes going to cost and do you have the budget?

- What is your migration process?
- What training must you put in place?
- What is your roll-out plan?
- What comes next: how can you use ESN capabilities to further improve operations?

Consider who needs to communicate with whom. What sort of battery life will devices require and what accessories, such as ear pieces and remote speaker microphones, will be needed? How will this change your operational procedures and is someone actively reviewing them now?

The ESN transition plan is geographically based on the ambulance service – as the emergency operation organised on the largest regional basis – which means other groups within those regions must be able to work together and share information from day one. Go through all the regional touch points with ESN one by one. Does equipment need to be upgraded? Will processes still work?

What are your cross-border challenges, such as shared resources?

The digital transition supports a degree of interworking between ESN and Airwave so it will be possible to have a mixed fleet initially, but how will you manage that?

Another key consideration is how to deal with the exponential increase in digital information down the line. The sheer volume of incoming broadband data – especially video – creates significant management and storage challenges for all the emergency services.

Welcome to better, safer ways of working

Our emergency services already work well together but the introduction of ESN will take collaboration, co-operation, efficiency, and safety to new levels.

Truly joined-up communications and fast, in-the-field access to good intelligence will enable better real-time decisions which, in turn, will improve the mental well-being of our frontline emergency personnel. Less form filling will improve people's working lives too.

Early adopters of ESN, those who fully embrace the change and all its possibilities, will be trailblazers for better and safer ways of working.



ESN financial facts

- **GBP3.6 billion:** estimated value of the benefits of ESN over 17 years
- **GBP1.2 billion:** estimated cost of ESN
- **GBP500:** estimated annual saving per device

Source: National Audit Office (September 2016)

About Mason Advisory

Mason Advisory is an independent IT and telecoms consultancy that does things differently – matching technology know-how with commercial and business sense. For 20 years, organisations across the public and private sectors have trusted our consultants to provide strategic advice and assurance for their most critical projects.

We continue to work for blue-light, transport and energy organisations both in the UK and further afield, and we are currently a member of the Home Office Delivery Partner team for the GBP1 billion+ Emergency Services Mobile Communications Programme.

We advise on all aspects of ICT, including fixed and wireless voice and data networks, control room and contact centre systems, and virtualised IT environments.

Contact us

If you would like to discuss how we can support you please email contact@masonadvisory.com or call +44 333 301 0093.

