About the Emergency Services Network

The Home Office is leading a cross-government programme to deliver the new Emergency Services Network (ESN) critical communications system. This will replace the current Airwave service used by the emergency services in Great Britain (England, Wales and Scotland) and transform how they operate. ESN will enable fast, safe and secure voice, video and data across the 4G network and give first responders immediate access to life-saving data, images and information in live situations and emergencies on the frontline.

Investment in ESN will also mean improvements to 4G network coverage, which will allow 999 calls to be made from any 4G enabled mobile phone in some of the most remote and rural parts of Great Britain where it was not previously possible.

While the technology that supports Airwave is reliable and fit for purpose, its limited capability means it cannot match the opportunities offered by newer critical communications mobile technology.

ESN's critical mobile technology will mean communication between the emergency services will take priority over other network traffic, even at peak times in busy urban locations. It will mean the emergency services and other first responders can share vital data, information and expertise quickly and securely from the frontline when it is needed most.

It will give the emergency services access to up-to-date products and applications as technology evolves. They will be able to choose what meets their unique operational requirements from the tools and technologies available.

Users for ESN include the police, fire and rescue and ambulance services as well as other users stretching from local authorities and utility services to first responders like inshore rescue. There are more than 300,000 frontline emergency service users who will depend on ESN, using handheld devices or operating equipment in 45,000 vehicles, 66 aircraft and more than 100 control rooms.

ESN will deliver:

- secure and resilient mission critical communications the emergency services and other first responder communities can trust to keep them safe
- a modern voice and data platform which will enable the emergency services to improve front-line operations
- a common platform to enable emergency services to work more closely together for data sharing in emergencies

The core application on which ESN runs is being provided by Motorola Solutions and the network infrastructure is being built by EE, by upgrading its existing network of around 19,000 masts, deploying 700 more 4G masts in rural areas and building new sites.

The Home Office is supplementing this coverage by building 292 masts to give the emergency services coverage in some of the most remote and rural areas of Great Britain. These sites are known as the Extended Area Service (EAS).

<u>How ESN is being delivered</u>

ESN is being delivered by the Emergency Services Mobile Communication Programme (ESMCP) in the Home Office.

The programme is delivering ESN in an incremental way by working collaboratively with those who will use it. The focus is on getting the products, coverage and services that emergency services need so they can be tested, adopted and used as they become available, rather than having to wait until every element of the network is finished. This will allow for continuous improvement to meet the evolving needs of emergency service users.

The approach will help to build secure and resilient mission-critical communications the emergency services can trust to keep them safe.

Coverage

Sufficient levels of coverage are essential to allow users to migrate safely from the current Airwave system to ESN. Coverage will be assured by a common, service-wide testing and assurance process by experts.

ESN coverage will be delivered in key areas of:

Great Britain primary area coverage

- contracted major and minor roads, selected buildings, select road tunnels and public facilities, as well as 12 nautical miles out to sea and up to 500 feet above the ground where it is operationally required
- Extended Area Service (EAS): major and minor roads that fall outside of those in the primary coverage area. These are rural areas including many national parks and areas of outstanding natural beauty
- London Underground and other metro and subway systems in Britain
- air coverage above 500 feet up to 10,000 feet where it is operationally required

In total, more than 950 new masts are being constructed and about 19,000 sites are being upgraded to facilitate the coverage needed for ESN across Great Britain.

ESN utilises the EE network and will benefit from its improvements to the existing commercial 4G network. Voice and data traffic for ESN will receive priority over other commercial mobile traffic and at times of network congestion.

Extended Area Service

The Extended Area Service (EAS) is a critical part of ESN and will ensure there is ESN coverage in some of the most rural and remote parts of Great Britain. A total of 292 4G sites are being built by the Home Office to supplement EE's ESN network and will maximise emergency service coverage in those areas.

Wherever possible, mast structures will be designed to be easily upgraded. As part of the government's commitment to increase digital connectivity EAS masts will be available for other mobile operators to offer commercial services as part of the Shared Rural Network programme run by the Department for Digital, Culture, Media and Sport.

Coverage assurance

Coverage assurance provides emergency services users the ability to test and assess coverage independently. It provides a common approach for checking coverage required from other ESN projects, for example ESN in the London Underground, and the EAS.

EE will use various measuring techniques to ensure there is network coverage in the areas for which it is responsible. ESMCP also has a coverage testing capability called Assure, which helps the emergency services to measure and report ESN coverage in their area and report on where it needs to be improved.

ESN Assure can be used with an app on a handheld ESN device which monitors coverage while on the move and in buildings.

Together, the emergency services and ESMCP are carrying out extensive coverage testing. This will give sight of any issues and allow the process to fix coverage gaps (gap-fixing) to start earlier, and so build user confidence in coverage availability and performance.

ESN Products

ESN Air

ESN Air is being delivered to support the emergency service aircraft. The product consists of two elements; firstly a 4G network, enhancing the current EE terrestrial network to allow users to operate to an altitude of 10,000 feet above sea level. Secondly, an aircraft communication system designed and built for installation and operation in all types of emergency service aircraft.

ESN Connect

ESN Connect is a SIM-only offer for vehicle modems and data-only devices on the ESN data service. It provides a fast, secure 4G data connection on the dedicated ESN network that is designed for emergency services use.

Users will benefit from data prioritisation, which means the device will perform consistently when using data at times of high traffic and network congestion. It will also be possible to request a higher level of prioritisation via the critical data bearer function if required.

In its simplest form, this is the ESN equivalent of a SIM-only data plan. It is for any emergency service organisation that needs a fast, reliable data connection – for example, in-vehicle dispatch messaging used by the ambulance service. ESN Connect does not need the public safety communication service application to operate.

ESN Direct

ESN Direct is a push-to-talk and critical messaging product on a smartphone.

It offers users earlier access to the ESN public safety application suite and insights into performance and usability. It has been utilised by the emergency services and other users to try out ESN public safety communications in less-critical scenarios and/or while dual-carrying an Airwave and ESN device.

ESN Beta

ESN Beta will enable members of the emergency services, or other first responders, to make push-to-talk calls, send secure messages and stream and send videos to other users.

It will be accessed on a rugged handheld device or a fixed vehicle device, installed in vehicles such as fire engines and police cars.

A forerunner to ESN Version 1.0, ESN Beta will not be used for mission critical operations where there is no Airwave back up available. As with earlier products, it will be put into the hands of users for tests and trials.

It will offer new features and capabilities including:

- enabling control rooms to connect with ESN end users for the first time
- giving administrators the ability to manage their organisations' devices and users via a self-service interface

ESN Beta's predecessors were products called Direct 1 and Direct 2, which were extensively tested by users and technical teams. The learning and feedback gained from collaboration with users helps inform ESN Beta development as the next iteration of the network.

ESN Version 1.0

ESN Version 1.0 will deliver all the public safety features and functionality required by the emergency services and first responder communities to start mass transition from Airwave to ESN, following a rigorous process of testing and trialling.

As with ESN Beta, the ESN application will also run on a rugged handset or a fixed vehicle device, and this will include further enhancements collected from user feedback gained during the trials and tests of earlier products.

These enhancements will ensure the software is fit for operational, mission-critical use and that it is safe and can be relied on.

This version will include all the features and functionality for users to begin to transition from Airwave to ESN.

Taken from - https://www.gov.uk/government/publications/the-emergency-services-mobile-communications-programme/emergency-services-network#:~:text=ESN%20will%20enable%20fast%2C%20safe,and%20emergencies%20on%20the%20frontline.