



Home Office

Emergency Services Mobile Communications Programme

Summary of the Full Business Case (FBC)
version agreed by the Major Projects
Review Group (MPRG) on 23/07/2021

Summary date: 03/02/2022

Introduction

This abridged version of the ESMCP FBC summarises the main themes from the actual business case that was agreed by MPRG on 23/07/2021, and has been made available as a reference document for user organisations. The business case provides an update on delivery of the Emergency Services Network (ESN) solution. ESN will replace the current Terrestrial Trunked Radio (TETRA) system known as Airwave (and Firelink within the Fire and Rescue Service) with critical mobile voice and data services for the emergency services of Great Britain (England, Scotland and Wales). The summary covers the five cases that form the business case; strategic, economic, commercial, financial and management cases. It should be noted that details included in the actual business case that are not for public consumption have been excluded from this summary.

Strategic Case

ESN's Vision

The ESN vision is to deliver a cost effective and improved mobile voice and data communications capability that supports and enables the emergency services to protect the public. We are moving from a dedicated bespoke network to a service that exploits commercial networks, benefiting from and tracking innovation in the consumer mobile market. This provides a communication and collaboration platform for our users that offers integrated voice and data and is in line with global standards for mission-critical communications. Switching Airwave off will save £250m per year.

The strategic case sets out the strategic drivers for the introduction of ESN which are:

- It supports key departmental priorities in:
 - managing civil emergencies in accordance with the Civil Contingencies Act 2004 within the remit of Funding Sponsoring Bodies; and
 - protecting vulnerable people and communities by providing the emergency services with communications coverage in rural and remote areas of Great Britain.
- It aligns with digital communications for emergency service strategies and developing international standards, mainly 3GPP (umbrella term for international mobile technical standards), for all elements of the end-to-end solution.
- It provides a voice and data service for the emergency services introducing a single network that allows the sharing of data (including images and video) and enabling faster adoption of mobile applications.
- It replaces the reliable but expensive, limited and ageing Airwave system.
- It represents value for money for the taxpayer by delivering steady state savings of circa £250m per year.

ESMCP

- It provides the emergency services with access to high speed, secure, resilient and prioritised data, which can support a range of applications and services across the emergency services.
- It minimises or avoids the need to develop bespoke components, relying instead on 'commercial off the shelf' products and commercial mobile networks to simplify delivery, reduce risk and support a more standards-based future.

The three emergency services (Police, Fire & Rescue and Ambulance, collectively referred to as 3ES) use Airwave for mission-critical voice and short data communications (in effect text messages or SMS) within and between the services. The Airwave system is a private radio network based on TETRA specifications. The central elements were rolled out in the period 2001-2005. Whilst Airwave provides reliable critical voice services, it is based on ageing technology, and in particular does not provide a mobile broadband data service. As a bespoke and standalone network, Airwave is extremely expensive to run. The Airwave network is operated by a single supplier, Airwave Solutions Ltd, now owned by Motorola, under a public finance initiative arrangement that began in 2001 and has since been extended.

The Home Office is leading the cross-government Emergency Services Mobile Communications Programme (ESMCP) to deliver the new ESN critical communications system to replace Airwave. The ESN service will introduce 4G/Long Term Evolution (LTE) technology capability to emergency services mobile communications. The ESN service will provide:

- Integrated voice and mobile broadband data capability
- Reduced reliance on bespoke infrastructure and increased ability to keep pace with mobile communications technology evolution as it is built on a commercial mobile network

The significance of the provision of reliable voice and data communications to our emergency services cannot be overstated. In the most extreme of circumstances, the reliability of the device and coverage can mean the difference between life and death. Equally important is the ability of the 3ES to work seamlessly together during everything from the routine to the most serious of incidents, in order to best protect themselves and serve the public. When fully adopted, ESN will enhance that capability.

The migration of emergency services critical communications to 4G/LTE is now the established direction of travel globally. Even where TETRA systems have been deployed relatively recently, for example in Germany, a supplementary data capability has been sought and this entails additional cost. ESN essentially provides voice and data at a lower overall cost, on a single network.

The independent review commissioned by the Infrastructure and Projects Authority into what strategies other countries are following in the area of emergency service communications is complete. It has also reached out to the international standards bodies who govern both

TETRA, (i.e. Airwave) and 4G/LTE (i.e. 3GPP). Firstly, there is wide agreement that TETRA will be obsolete towards the end of the current decade, and increasingly expensive to support beyond that. Secondly, all the countries that were interviewed are intending to follow the same strategy as Great Britain, with six countries well on their way. All countries have benefited from Great Britain's experience as one of the first adopters.

The programme has consulted widely and in depth with users in the preparation of the FBC. Consequently, timelines were amended to ensure a more realistic and agreed delivery plan in which users and other stakeholders can have confidence. The business case was predicated upon the planning assumption that 3ES will start to transition to ESN from 2024, and transition will complete around the end of 2026. Whilst we are working to deliver the technology in the shortest possible timeframe, the transition of users from Airwave to ESN needs to consider safety and operational imperatives above all else. For this reason, the timeline needs to allow us the flexibility to upgrade over 200 control rooms and transition circa 300,000 users to the new service.

The case for continuing the ESN programme remains compelling despite the comparatively short timespan over which the benefits and savings are measured (to FY 2036/37). However, the ESN solution and its benefits to the public, in both increased public safety and economical terms, will persist beyond 2037.

ESN will introduce a mission critical push to talk (MCPTT) solution based on modern mobile telephony technology (4G/LTE) to emergency services mobile communications, providing an integrated voice and data capability. Crucially, it reduces the reliance on bespoke infrastructure, and it will leverage mobile communications technology developments allowing the 3ES to benefit from wider commercial improvements in capability over the lifespan of the service. It is built on a commercial mobile network, meaning that it is therefore projected to be much cheaper to run than Airwave (with annual savings at circa £250m per annum). Core ESN capability has been proven to work, for example, Bedfordshire with Connect fleetwide from November 2021 and West Yorkshire FRS use Direct 2 (voice communications) for a limited subset of users alongside Airwave as a fallback. It has also been used by Immigration Enforcement staff operationally in low risk environments.

The programme's Independent Assurance Panel (IAP) has looked at the emergency communication strategies that other countries are pursuing. The panel interviewed the international standards organisation, ETSI (European Telecommunications Standards Institute), and those responsible for emergency communications in nine other countries and concluded that Great Britain is following the right strategy. The IAP observed that there are no plans to develop advanced data communications capabilities within TETRA. The view of ETSI is that TETRA will effectively be obsolete by 2030.

The IAP review highlights the fact that all the administrations they have spoken with are in the process of replacing their TETRA capability or are about to start. There is no evidence that anyone is planning to retain TETRA beyond 2030, and a number will have fully implemented an alternate solution by 2025.

The IAP review concluded that retaining TETRA in any form is not recommended; 4G/LTE is the chosen path for ESN. A number of countries have been watching ESMCP and have learnt from the programme's evolution; from a time where there were no international standards to a point at which we now have devices in users' hands.

The main strategic risks for the programme are:

- The successful implementation of ESN depends on user organisations being satisfied that it is an adequate replacement for Airwave and provides sufficient capacity, coverage, security and resilience to meet operational needs, as well as being affordable in order to manage future financial pressures on other operational services they provide.
- The programme may be unable to secure a long-term financial commitment in terms of Spending Review funding for the life of the programme to enable delivery within timescales. The Covid pandemic impact is also likely to result in financial pressures across government departments to achieve savings over the coming years.
- There is a financial affordability pressure that may constrain the programme and its stakeholders' critical path to transition. There are supplemental activities that may incur additional spend over and above the costs identified in the FBC, that may risk the ability of user organisations to be able to afford the transition from Airwave to ESN.
- The ability of one or more suppliers to deliver in the required timeframe, which could result in further delays.
- Management of the conflict of interest presented by Motorola being both a main supplier to ESN and the owner of Airwave. This must ensure fair competition and not put user organisations at a commercial disadvantage, as well as ensuring the future device strategy promotes growth in the competition market for future procurements.

The programme has an ongoing risk management system to ensure that containment and mitigation plans are in place for all programme risks.

Economic Case

The economic case considers the following options:

- **Option 1:** Stop ESN and continue with Airwave indefinitely (do minimum)
- **Option 2:** Stop ESN, extend Airwave and start a new programme to replace it from April 2022 (discounted before full appraisal)
- **Option 3:** Deliver ESN incrementally, with a risk-based expected Airwave Shut Down date of December 2026.

As explained above, Option 1 which would mean Airwave continuing, really is not a realistic option that would deliver the capability required for emergency services and would be financially unsustainable. Option 2 would, in effect, mean that the investment in the development of the ESN service to date would be lost.

Option 3 (the preferred option) is based on a realistic plan and assumptions of when the transition from Airwave to ESN can be achieved for user organisations. This plan is based on:

- Delivery of the functionality that users require to commence transition with a solution that is operationally safe and fit for purpose by mid-2023.
- The need for users to have a comprehensive assurance process including six months of Operation Evaluation that will not start until the full functionality is delivered.
- Three months of live pilot to further exercise the solution in a live unconstrained environment whilst formal service governance is undertaken to thoroughly review and accept ESN as a safe and secure service.
- A transition window of 27 months that will allow user organisations to safely move from Airwave to ESN.
- The provision of core network coverage ahead of transition commencing. This includes the London Underground and remote areas delivered under the Extended Area Services (EAS) project. Whilst the programme recognises that further additional coverage for critical operational locations will continue to be put in place during transition, no user organisation will be asked to commence their transition until they have acceptable coverage.
- Completion of control room upgrade work to ensure that control room systems and necessary components are upgraded to interface with ESN. Whilst further development is required, the current plan allows for this to be completed away from the critical path.

The business case concludes that Option 3 offers by far the best Net Present Social Value (NPSV) by introducing a system that:

- Matches and improves on Airwave's critical voice functionality at lower cost.
- Provides significant additional data functionality than Airwave.
- Delivers a series of benefits to the general public, particularly around coverage.

Economic Benefits

The monetised benefits in the table below phase in as the ESN network is fully rolled out. These benefits are all non-cashable wider public benefits and do not include the benefit of 3ES transferring from Airwave to ESN, which instead enter the NPSV through reductions in cost.

It is important to note that this cost reduction element (about £250m per year) far exceeds the total of other all other benefits.

| Monetised benefits | Description |
|---|--|
| Other user savings | Other current non-emergency service users of Airwave switch to ESN, leading to savings for society. |
| Saved lives in mobile coverage not-spots | Lives saved through having the ability to call the emergency services for help in current signal not-spots. |
| Mobile coverage (residents) | Benefit of 4G mobile phone coverage to the general public in current signal not-spots which will now get coverage due to ESN. |
| Mobile coverage (businesses) | Benefit of 4G mobile phone coverage to businesses in current signal not-spots which will now get coverage due to ESN. |
| Mobile coverage (roads) | Benefit of 4G mobile phone coverage to passengers in vehicles on roads in current signal not-spots which will now get coverage due to ESN. |
| Mobile coverage (trains) | Benefit of 4G mobile phone coverage to individuals on trains in current signal not-spots which will now get coverage due to ESN. |

We expect that ESN will deliver improvements in efficiency and effectiveness for all users compared to Airwave and their current commercial mobile offerings, however these benefits have not been monetised.

As user organisations and the Programme work together towards implementation of the ESN service, this will only be on the premise that the operational service can continue to be delivered without 3ES users being put at risk.

Commercial Case

The commercial case provides historical context for the programme's current commercial structure. It explains why there is the same supplier for the legacy Airwave contract and the ESN Lot 2 contract.

The existing legacy Airwave contract has been extended until December 2026 from its current end date of December 2022.

The long-term commercial challenges are being worked through, including how procurement can support a future operating model and allow ESN to evolve to take advantage of technological advances, and continue to deliver value for money. In addition, the current structure of ESN contracts needs to be reviewed in order to examine the possibility of maximising the opportunities of disaggregation, with contracts aligned to international mobile technical standards driving greater competition in the supply chain.

Finance Case

The actual financial case contains the breakdown of the cost of the programme to date, and for the lifetime of the business case to 2036/37. It also covers how funding for the ESN service is allocated between the Home Office, Department of Health and Social Care (DHSC), and the Scottish and Welsh Governments.

Based on the preferred option (option 3, incremental delivery of ESN), the total cost of the ESMCP programme to 2036/37 including costs that have already been incurred and the costs of Airwave until ESN is fully rolled out is £11.3bn.

Management Case

ESMCP is a complex programme that is a cross-government and multi-agency undertaking which necessitates for multi-tiered and parallel governance arrangements. The management case outlines how ESMCP manages all the different facets needed to deploy and implement the preferred option in such an environment successfully.

The Programme Senior Responsible Owner (SRO), Simon Parr, has ultimate accountability for the Programme. The Programme Director, John Black, has responsibility for the delivery of the programme.

ESMCP is included within the Government Major Projects Portfolio (GMPP), which contains approximately 200 of the largest and complex government projects. This brings with it a number of reporting requirements that are managed through the Infrastructure and Projects Authority, a joint unit of the Cabinet Office and the Treasury.

The governance structure levels align with the overall programme structure Levels 0-4:

- **Level 0:** Programme Board: Provide oversight and direction, ensuring efficient and effective operational leadership of the ESMCP programme. This board brings together key stakeholders from across Government, including Funding Sponsoring Bodies, 3ES Senior Users (SUs), and other senior representatives of the user communities and other stakeholders. This is chaired by the SRO and reports into the Ministerial Steering Committee.

- **Level 1 Boards:** Programme Level Boards: In place to oversee the successful delivery of the key facets of the programme in terms of strategy, design, delivery and management of the programme itself. SUs and suppliers are members of the Project Review Board. These are chaired by the Programme Director.
- **Level 2 Boards:** Functional Boards: Make decisions on key delivery areas, such as approval of level 2 milestones, assumptions, dependencies and risks. The majority of these have user representation and there is a dedicated board to Assurance, and one governing deployment of the ESN solution to user organisations. These are chaired by function leads.
- **Level 3 & 4 Working Groups:** These support the running of workstreams and the management of interactions between workstreams. This also includes governance which is being established within user organisations to successfully deploy the ESN solution. This includes the Deployment Delivery Group, which monitors and controls deployment across the regional/service level. These are typically chaired by workstream/project leads.

ESMCP reports to the Home Office Finance & Investment Committee for investment related requests that require Home Office approval. It also reports to the Home Office's Commercial Approvals Board for commercial approvals, and technical approvals from the Technical Delivery Board for technical assurance.

User Engagement Strategy and Plan

User engagement activities are underpinned by a user engagement strategy which outlines the outcomes and principles for effective user engagement. The user engagement plan is built based on programme attendance at user governance at the national, regional and local level but also includes one to one engagement with key stakeholders from the user community and a sequenced set of targeted engagement activities to support delivery of the outcomes below.

The outcomes that effective user engagement aims to achieve are:

- Building confidence in ESN capabilities and deliverability
- Ensuring structure and consistency in all interactions with the programme
- Meeting the dynamic needs of user organisations
- Keeping users informed throughout the delivery lifecycle.

Communications Strategy and Plan

The communication strategy for the programme is focussed on how professional communication tools and techniques can support the delivery of the programme. The strategy is underpinned by a communications plan that is jointly owned and developed with user representatives and core suppliers in a regular forum chaired by the Communications Lead within the programme.

Deployment

ESN deployment planning to date has had to be assumptive. As a result of the re-baselining of the Integrated Programme Plan, most deployment-impacting assumptions will be addressed. However, given the technical nature of ESN functionality; the need to perform transition planning well in advance of the solution and enabling capabilities being delivered; and the operational environment into which it is being deployed an element of assumptive planning will always feature in user organisation deployment plans.

Deployment planning will take an iterative approach, with deployment plans being refined over time. The initial priority of the ESMCP Programme is to identify a high-level deployment timeline for each of the 3ES England, 3ES Scotland and 3ES Wales. In order to achieve this, a service deployment sequencing plan will be developed which identifies the first user to commence deployment and the last user to finish all transition activities within each service.

The service deployment sequencing plans will be underpinned by detailed deployment plans for each individual user organisation deploying ESN. These sequencing plans will be coalesced into a single ESN national deployment plan that will provide a baseline plan for ESN Deployment and capture the end-to-end timeline against which each user organisation will deploy ESN.

Transition

The Home Office ESN Live Service team is responsible for all ESN products once they have reached / achieved Service Acceptance. The Full Operating Model will be delivered before Airwave is shut down and will allow the programme to be closed and all remaining services provided by the programme to be subsumed into a sustainable organisation.

Benefits Realisation

The programme is following the Home Office benefits management guidance and processes within the Home Office Investment Portfolio. The programme will use a benefit profile and Benefits Realisation Plan to manage, track and report benefits realisation progress throughout delivery.

Glossary

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| 3ES | The three emergency services, i.e. police, fire and ambulance |
| 3GPP | 3 rd Generation Partnership Project. The telecommunications standards development organisation which develops technical specifications for communications solutions such as mission-critical push-to-talk, mobile communications networks and a range of other communications solutions deployed in the industry |

ESMCP

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| ESMCP | Emergency Services Mobile Communications Programme |
| ESN | Emergency Services Network, system that will replace Airwave |
| ETSI | European Telecommunications Standards Institute |
| FBC | Full Business Case |
| GMPP | Government Major Projects Portfolio |
| IAP | Independent Assurance Panel |
| LTE | Long Term Evolution; standard of wireless data transmission for mobile devices that allows increased capacity and speed using a different radio interface |
| MCPTT | Mission Critical Push-To-Talk (the functionality for devices to be able to communicate with other users) |
| MPRG | Major Projects Review Group |
| NPSV | Net Present Social Value; standardised calculation of the present value, taking account of future costs and benefits allowing multiple options to be compared |
| SRO | Senior Responsible Owner |
| SU | Senior User; nominated lead representatives of each of the user communities including police, fire, ambulance, Wales, Scotland, and larger national organisations |
| TETRA | TErrestrial Trunked Radio; radio technology upon which the Airwave system is based |