



National Audit Office



REPORT

# Progress with delivering the Emergency Services Network

Home Office

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National Audit Office

# Progress with delivering the Emergency Services Network

Home Office

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## Report by the Comptroller and Auditor General

Ordered by the House of Commons  
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National Audit Act 1983 for presentation to the House  
of Commons in accordance with Section 9 of the Act

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**Gareth Davies**  
**Comptroller and Auditor General**  
**National Audit Office**

**3 March 2023**

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The National Audit Office study team consisted of:


Chris Battersby, Richard Lewis, Odera Ndujiuba, under the direction of Emma Willson.

For further information about the National Audit Office please contact:

National Audit Office  
Press Office  
157-197 Buckingham Palace Road  
Victoria  
London  
SW1W 9SP

 020 7798 7400

 [www.nao.org.uk](http://www.nao.org.uk)

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## Key facts

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**£2.0bn**

forecast amount spent on ESN up to March 2023

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**uncertain**

total expected lifetime spend on the Emergency Services Mobile Communications Programme. In June 2021, the Home Office estimated this at £11 billion, including the cost of running ESN and Airwave until ESN replaces it. The Home Office is updating its forecast which will increase

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**uncertain**

date Airwave is expected to be turned off. In June 2021, the Home Office forecast to end Airwave in December 2026. It is updating its forecast, but delays are expected

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**99.86%** target for the availability of Airwave, which is generally exceeded

**£1.1 billion** Competition & Markets Authority's (CMA's) provisional estimate of Motorola's supernormal profits, without a charge control, from operating Airwave between January 2020 and December 2026

**>£150 million** potential annual savings on the cost of Airwave from 2023 to 2029, should the charge control provisionally suggested by the CMA be introduced

**£304 million** total amount the Home Office forecasts it will have paid Motorola for the Emergency Services Network (ESN) to 31 March 2023. This includes for software and systems that the Home Office will not use when ESN operates, but considers valuable, and recurring payments for having aspects available for testing

**£27 million** amount the Home Office agreed, in December 2022, to pay Motorola to settle outstanding milestones and disputes following negotiations to end its ESN contract early. Motorola will also be paid £18 million to continue testing and enable the Home Office to ensure that ESN works with Airwave

## Summary

**1** In 2015, the Home Office contracted with suppliers to provide a new communication network (Emergency Services Network, ESN) to replace its existing Airwave network. All 108 police, fire and ambulance services (users) across England, Scotland and Wales use this critical network to communicate between the field and control rooms. As part of its Emergency Services Mobile Communications Programme (ESMCP, or the programme), the Home Office intended ESN to fully replace Airwave, cost less and provide users with access to modern mobile data.

**2** For users to start using the new network and then turn off Airwave, various elements need to work together. In 2015, the Home Office contracted with EE Ltd (EE) to provide priority access to its mobile network and increase network coverage. It also contracted with Motorola Solutions UK Limited (Motorola) for software and systems including critical features not normally found on a mobile network, such as a first-of-a-kind 'push-to-talk' functionality.<sup>1</sup> The Home Office has contracted different suppliers for other parts of the programme such as upgrading users' systems and ensuring that ESN covers remote areas.

**3** In 2016, our first report on ESMCP assessed the programme as high risk because of: the commercial approach; the ambitious technology and timetable; and uncertainty about users accepting ESN. It found that Motorola's purchase of Airwave in February 2016 created commercial risks given Motorola's role in ESN. It also found that the Home Office was trying to adopt an approach not used at a national scale in other countries which carried significant implementation risk. When we reported a second time, in 2019, we found that after a reset in 2018 the programme remained high risk. We reiterated that the Home Office should carefully manage the risk associated with Motorola's dual roles.

**4** In April 2021, as the Home Office considered that Motorola's Airwave profits were excessive and disincentivised it from completing its ESN contract, it wrote to the Competition & Markets Authority (CMA). To remove the risk that it would be forced to sell Airwave, in November 2021, Motorola told the Home Office that it may not extend its ESN involvement beyond December 2024. In 2022, the Home Office began to find a replacement and agreed to end Motorola's contract early.

<sup>1</sup> 'Push-to-talk' is the ability to make near-instant calls at the push of a button without having to wait for the recipient to answer.

**5** The Home Office forecasts that, between April 2015 and March 2023, the programme will have spent £2.0 billion on ESN and £2.9 billion running and maintaining Airwave. In 2018, following significant delays, the timetable for turning off Airwave was extended from 2020 to 2022. In 2021, the timetable was extended further to 2026. Following recent events, the Home Office now expects the date for turning off Airwave to be later, but it cannot be more specific until it has replaced Motorola.

**6** Our previous reports evaluated the Home Office's progress with ESN. This provides context for our current report, which describes the Home Office's progress since our 2019 report and our view of the programme's risks and issues. We do not evaluate performance to date, or seek to apportion responsibility for any challenges experienced by the programme. Because of the uncertainty facing the programme, we do not assess the value for money of continuing the programme or provide an exhaustive list of risks.

## **Key findings**

Progress since our last report

**7 In December 2022, the Home Office and Motorola agreed for Motorola to leave ESN early and receive £27 million to settle outstanding milestones and disputes.**

By late 2021, when Motorola had said it may not extend its ESN involvement, the Home Office and Motorola had limited confidence in each other's ability to complete the software within the time available and to work constructively together. The Home Office and Motorola therefore negotiated to terminate Motorola's ESN contract early, which the Home Office concluded was the quickest and least risky way to exit the contract. In December 2022, the Home Office agreed to pay Motorola £45 million which included £27 million to settle outstanding milestones and disputes, with the remainder for both testing and enabling the Home Office to ensure that ESN works with Airwave. The Home Office recognised that Motorola's exit from the programme would have a significant impact. It must introduce new software and systems and, while it finds another supplier, other parts of the programme have been paused (paragraphs 1.3 to 1.5 and 1.16 to 1.17).

**8 The Home Office has not received the critical systems and software that ESN needs, and will not use any of Motorola's work when ESN is live.**

In November 2021, when it indicated it could leave the programme, Motorola had been paid for meeting 85%, by value, of its contractual milestones. Some initial versions of Kodiak, provided by Motorola, were completed late. In June 2022, the Home Office estimated that delays to versions of ESN, which relied on Motorola's software, would contribute to pushing the programme back by 15 to 27 months. We have not attempted to determine responsibility, or to exhaustively set out reasons for delays to which both the Home Office and Motorola will have contributed. The Home Office forecasts that it will have paid Motorola £304 million by 31 March 2023. This includes recurring payments for having elements of ESN available for testing and payments for creating ESN software and systems. The Home Office does not expect to use any of the software and systems provided in ESN but considers that it has obtained some value from this work (paragraphs 1.11 to 1.17 and Figures 4 and 5).



**9 Other elements of the programme have been delayed with some not able to progress until the Home Office finds a new user services provider.** For example, work to provide users with full network coverage is progressing more slowly than expected in 2019. Although the Home Office considers that it can predict where coverage is incomplete, this has not been fully tested. EE has nearly completed its work to establish the main network, but the Home Office must still obtain planning permission for work on 42 of the 292 remote area sites. The Home Office no longer has a contract to provide it with a handset for ESN. The handset it had procured will not be supported after 2023. As the handset must work with the systems and software, the Home Office expects the new user services supplier to provide a handset for testing. The Home Office also needs to ensure that users can upgrade control rooms, but it does not have a full understanding of the work involved (paragraphs 1.18 to 1.26 and Figure 6).

**10 Although Airwave will eventually become obsolete, the Home Office does not know with certainty that it cannot last during the 2030s.** It continues to perform well, generally exceeding its 99.86% availability target, and users are confident that it allows them to communicate effectively. In using Airwave, the Home Office recognises that it must maintain a relationship with Motorola as Airwave's owner. This may be more challenging because any remedies decided upon by the CMA could affect this relationship. Although Airwave technology will eventually become obsolete, the Home Office does not know when this will happen. While some countries are replacing Airwave technology, others continue to use it with Motorola confident that Airwave can be used well into the next decade with adequate investment. Continuing to use Airwave could cost at least £250 million a year. For this to happen, the Home Office must formalise extending the Airwave contract beyond 2026, and itself or users must pay to maintain and replace some Airwave devices and control room systems. The Home Office considers that it cannot take the risk of remaining on Airwave. In August 2022, the Home Office decided to continue with ESMCP because it would cost more to start a similar programme that introduces a new network by the 2030s (paragraphs 1.6, 1.27 to 1.29 and Figure 7).

## Commercial risks

**11 The Home Office is currently trying to find a suitable replacement for Motorola, which addresses some risks.** Motorola provided critical aspects of ESN, including push-to-talk software. The new supplier will not have the same conflicting incentives as Motorola, who owns Airwave. The Home Office had considered making a direct award of Motorola's contract to EE but in August 2022, after analysing its options, decided to reprocure the contract. It began engaging with the market in October 2022 and expects to award a contract in April 2024. The Home Office told us that it assesses the risk of not identifying a supplier as low because alternative technology is available, but it has not yet been able to fully test this assessment (paragraphs 1.11 to 1.18 and 2.3 to 2.4).

**12 After considering alternatives, all of which the Home Office assessed as medium or high risk, it decided to continue with its current commercial approach to avoid further delays.** It recognises that the split of responsibilities between suppliers is suboptimal. It cannot fully address this without revisiting its other contracts, which would delay the programme further, and it has concluded that the current structure is workable. It has started to identify detailed lessons to help improve the new user services contract. As part of this contract, to help build users' confidence in ESN, it will continue to specify detailed requirements in advance but recognises that it may need to respond flexibly to user feedback. We have previously found that government digital projects need a flexible contracting process that recognises that scope and requirements may change (paragraphs 2.5 and 2.6).

**13 The Home Office plans to award EE a new contract, without competition, extending the role of EE.** Between 2015 and March 2023, it forecasts that it will pay EE £660 million for network infrastructure. EE's contract was due to be recompleted in 2022 but, following the 2018 reset, was extended to 2024. The Home Office is now seeking to award EE a new contract, without competition, to avoid delaying the programme. It intended the programme to use short-term network infrastructure contracts to avoid being locked into a single supplier and to take advantage of innovation. Extending EE's role creates a longer-term risk that the Home Office cannot realise these benefits. Also, a direct award may be subject to a higher risk of challenge, which could then delay the programme. The Home Office intends to recomplete the contract when it ends (paragraph 2.7 and Figure 4).

#### Technology risks

**14 There remains a risk that the technology will not work at scale across a mobile network.** The system to be provided by Motorola was regarded as market-leading and alternatives may require significant development. Since the Home Office contracted with Motorola in 2015, the market for this technology has widened with other countries developing similar approaches, and the Home Office is now more confident that ESN will technically work. However, it still needs to be developed to the standard and scale that ESN requires. The new contract will be the Home Office's third attempt to procure this technology. The Home Office has yet to test the technology in real-world conditions at any significant scale (paragraphs 2.8 to 2.10).

**15 The Home Office has not yet decided how ESN will come together as a network and who will be responsible for the live service.** We previously found that the Home Office was unclear as to how the different elements of ESN would be made to work together (“integration”), and did not have the capability it needed to fulfil its role. It started rating technical integration as a ‘red’ risk in February 2022. As the required skills are not always available within the Home Office, it has relied on contractors. It does not yet know how hard it will be to integrate the new software. This will depend on whether there is a clear technical architecture and whether Motorola’s work followed expected standards so can be easily replaced. The Home Office has paused work on how it will run ESN when it is live and it will resume this work when a replacement for Motorola is appointed (paragraphs 2.11 to 2.13 and 2.26 to 2.28).

#### User take-up risks

**16 Users are now more confident in the programme’s leadership but organisations expect to decide themselves whether to use ESN.** Police and fire user representatives told us that they had an improved relationship with leaders who better understood their needs. The Home Office has also made progress in agreeing with users the requirements that must be met before determining whether ESN can fully replace Airwave. However, individual police forces will make their own decisions about when to stop using Airwave. As suggested in our previous reports, given the complex network of users and approvals, getting users to accept ESN as a replacement for Airwave is inherently difficult. Transition planning remains at an early stage and some users are now temporarily disbanding dedicated ESN teams that had been preparing for testing and transition (paragraphs 2.14 to 2.22 and Figures 9, 10 and 11).

#### Programme-management risks

**17 The Home Office recognises the programme as high risk but has not been able to reduce many of the significant risks.** While it has improved the information reported to the programme board, this is sometimes inconsistent and incomplete. Since April 2021, most reported risks have consistently been assessed in the highest or second highest category. Most of those we observed in 2019 are still reported as risks and some have become more challenging or have crystallised. The Home Office told us that it now has increased confidence in the programme’s leadership. From June 2022 to February 2023, the programme’s senior responsible owner, who has a policing background, also had temporary responsibility for the National Law Enforcement Data Programme. This is something the Home Office previously told Parliament it would avoid (paragraphs 2.23 to 2.27 and Figures 8 and 12).

**18 The Home Office is updating the programme rationale alongside the timetable and costs.** It is developing a new business case, for approval in 2024, which will set out a revised strategic case for continuing the programme. The programme's original objectives from 2015 – saving money and bringing mobile data to users – may no longer be as strong justifications for the programme. The CMA's provisional recommendation for a charge control on Airwave would save the taxpayer at least £150 million a year between 2023 and 2029, which would then reduce any savings from ESN.<sup>2</sup> Also, most users we surveyed are already using data, including through commercial mobile contracts. Where users have adopted different data contracts, it will be harder for the Home Office to standardise approaches, which has an impact on both data and security risks. The Home Office told us that it would set a realistic programme timetable, not necessarily led by the end of the Airwave contract (paragraphs 2.29 to 2.30).

### **Concluding remarks**

**19** The Home Office forecasts that it has spent some £2 billion on ESN since 2015 but is a long way from having a functioning network to replace Airwave. A 2018 reset, introduced to address technology and commercial issues, did not work. Recognising this, in 2021 the Home Office wrote to the CMA expressing concerns over Airwave's excessive profits and Motorola's incentives to complete ESN. Subsequently, Motorola indicated that it may leave ESN and, in December 2022, the Home Office and Motorola agreed to end Motorola's ESN involvement early. This addressed recognised issues but means that the Home Office has paid Motorola for software and systems it will not use and Motorola has written-off some ESN investment. The Home Office must find a new supplier, which will not happen before April 2024, to continue the programme. However, although replacing Motorola may have been necessary, it does not guarantee that the programme will succeed.

**20** With the aim of putting the programme onto a stable footing, the Home Office has taken some tough decisions. These affect the programme's risks and uncertainties, but the Home Office cannot yet be certain of the impact of its actions. It now has more confidence in the programme leadership, which has improved the programme's relationship with users that is critical to ESN being accepted. However, ongoing uncertainty risks putting this new-found confidence at risk. To avoid doing so, the Home Office needs to make clear to users the value of ESN, particularly as Airwave meets their expectations and many have their own data solutions. It also needs to continue revising timetable and cost estimates, avoiding a repeat of past mistakes such as setting unrealistic time frames; complete other aspects of ESN; and bring everything together into a working service. Because Airwave will eventually need to be replaced, the Home Office must make sure that it has taken the time it needs to fix the problems and not waste money, as we have previously reported, or reset the programme again.

<sup>2</sup> Figures estimated in October 2022, at the time of the CMA's provisional decision.

## Recommendations

**21** Given the significant uncertainties facing the programme, the Home Office has an opportunity to ensure that the programme establishes a sustainable and realistic foundation. To help it do so, as it continues to redevelop its plans, we recommend that it:

- a** completes the work it has started to revisit the programme's objectives and assumptions, and to re-articulate the programme's rationale to demonstrate whether ESN remains the right thing to do given the increasing use of mobile data by users and technology developments;
- b** before the end of 2023, establishes a process for continually assessing the risks and investment required to maintain Airwave to better understand how long this network could be used for, and therefore the time it has available to complete ESN;
- c** continues developing a revised programme plan. This should include realistic time frames that are not driven by an arbitrary date for shutting down Airwave, but which allows sufficient time to complete and test that ESN's technical architecture works. This should include time and cost estimates that allow for optimism bias and are presented in ranges to reflect uncertainty where appropriate;
- d** uses its experiences from the user services contract to better manage the risks that it needs to avoid, or mitigate, with the new supplier to increase the likelihood of the technology being introduced on time and in line with users' needs;
- e** ensures that the new network infrastructure contract has sufficient mechanisms and incentives to establish effective relationships and ensure value for money within this contract period, while supporting a wider strategy for how the Home Office will avoid being locked into one supplier in the future; and
- f** improves the programme's management information, so that it is consistent and timely, and includes metrics as well as leading indicators to help consider progress and identify where action is required.

# Part One

## Programme status

**1.1** In 2015, the Home Office contracted with suppliers to start work on the Emergency Services Mobile Communications Programme (ESMCP, or the programme) to provide a new, critical, voice and data communications network (the Emergency Services Network, ESN) to all 108 emergency service organisations and over 380 other bodies (users). **Figure 1** shows the main elements of ESN. This part of the report sets out spend and progress to date alongside recent developments, including with Airwave, which is the network that users will continue to operate until ESN works fully.

### Developments since our last report

**1.2** In 2016, we reported the programme to be high risk, with risks around the commercial approach; an ambitious timetable for delivering world-leading technology; and reliance on users accepting that ESN was as good as Airwave. The Home Office was trying to adopt an approach not used nationwide elsewhere, which carried significant implementation risk.<sup>3</sup> In 2018, it reset the programme to deliver ESN incrementally. Our second report, in 2019, found that the Home Office had not managed the programme risks leading to poor value for money and delays.<sup>4</sup> The Home Office was unlikely to turn off Airwave by December 2022 as planned. Uncertainty and significant risks remained. The report reiterated that the Home Office should carefully manage Motorola Solutions UK Ltd's (Motorola's) role as Airwave owner and ESN supplier.<sup>5</sup>

3 Comptroller and Auditor General, *Upgrading emergency services communications: the Emergency Services Network*, Session 2016-17, HC 627, National Audit Office, September 2017.

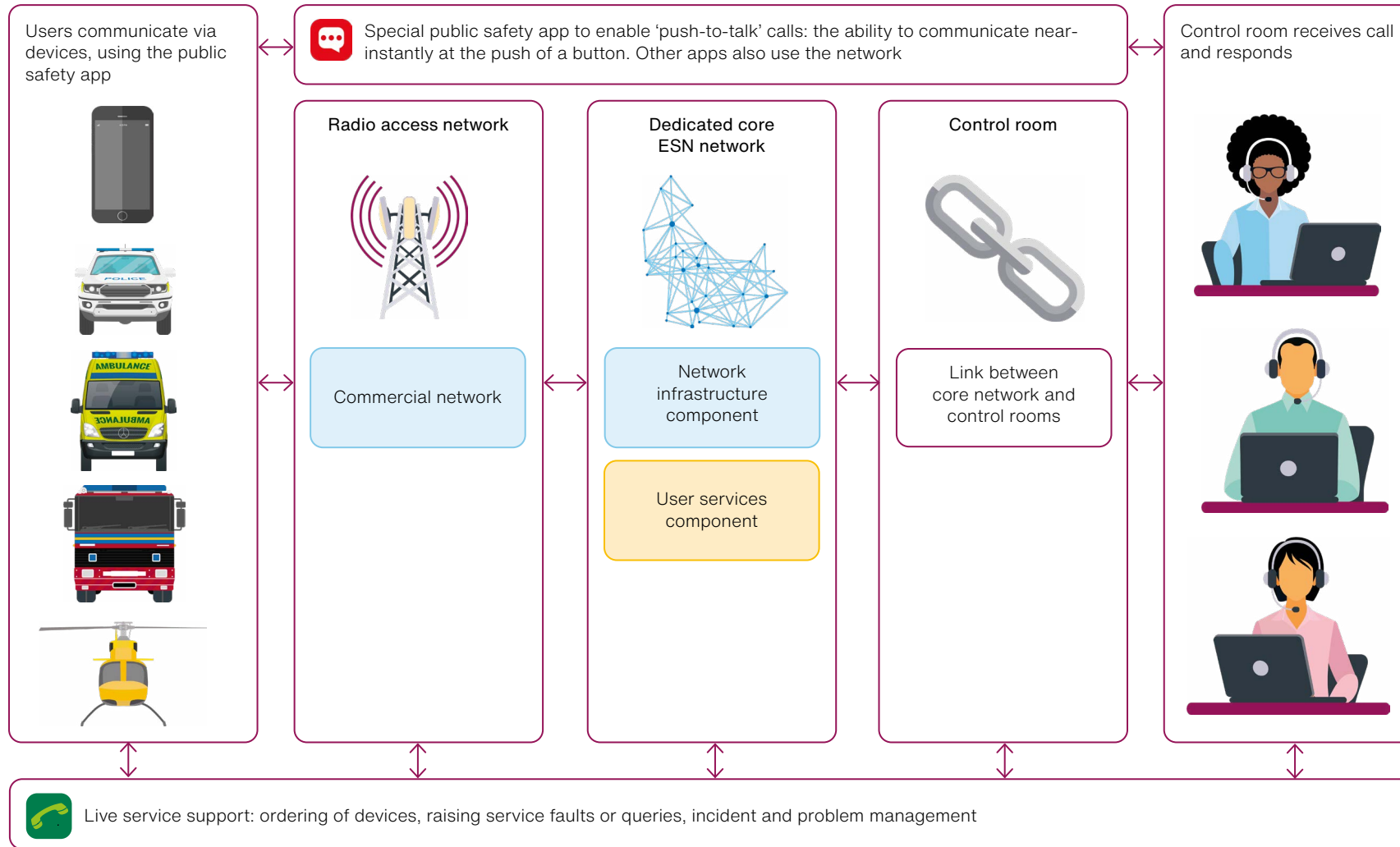
4 Comptroller and Auditor General, *Progress delivering the Emergency Services Network*, Session 2017-2019, HC 2140, National Audit Office, May 2019.

5 Motorola purchased Airwave in 2016, becoming the incumbent supplier of Airwave alongside being an ESN supplier.

# Figure 1

## The Emergency Services Network (ESN)

ESN comprises multiple elements that all need to be delivered for the network to operate



□ Network component  
 □ User services component  
 → Different elements of ESN are connected

Source: National Audit Office simplification of Emergency Services Mobile Communications Programme documentation

**1.3** Since 2019, significant developments have affected the programme (**Figure 2**). In April 2021, during a period when government's Major Projects Review Group had been discussing the programme, the Home Office wrote to the Competition & Markets Authority (CMA) expressing concerns about the Airwave contract.<sup>6</sup> It considered that Motorola's Airwave profits were excessive and that this disincentivised Motorola from completing its ESN contract. Similar concerns had been raised by the National Audit Office and the Committee of Public Accounts since 2016.

**1.4** In June 2021, the Home Office approved a revised business case, which HM Treasury subsequently approved in July subject to conditions including the Home Office developing a contingency plan for the Motorola contract. The business case extended the timetable for turning off Airwave to 2026 (**Figure 3** on page 16). At that time, the programme board was aware of risks and issues – in March 2021, the Infrastructure and Projects Authority had rated delivery confidence as 'amber/red'.

**1.5** In October 2021, following a public consultation, the CMA launched a market investigation to consider whether competition in the market for the supply of 'communications network services' for public safety in Great Britain was working well. This included investigating Airwave as the only provider of such a network. Should it identify anticompetitive features, the CMA can impose remedies such as price regulation. In November 2021, Motorola told the Home Office that, to remove the risk that it would be forced to sell Airwave, it may leave ESN after December 2024 when its contract ended. It told the Home Office that it should seek alternative arrangements for the software and services it was providing ESN, but that it might consider recommencing discussions if selling Airwave ceased to be a potential remedy following the CMA investigation.

**1.6** In August 2022, the Home Office evaluated its options for the programme, which included discontinuing work and remaining on Airwave. It recognised that Motorola leaving the programme would have a significant impact – until it finds another supplier, parts of the programme have been paused. It decided to continue the programme because it considered that Airwave was likely to need replacing by the 2030s, so work on any replacement would need to start by 2025. It estimated that, at that time, cancelling and restarting the programme would incur additional costs of roughly £4.5 billion compared with the estimated costs of completing the programme.<sup>7</sup>

<sup>6</sup> The Major Projects Review Group, jointly chaired by the Civil Service Chief Operating Officer and HM Treasury's Director General for Public Spending and Finance, scrutinises government's most complex programmes on behalf of HM Treasury and advises ministers on whether programmes should proceed.

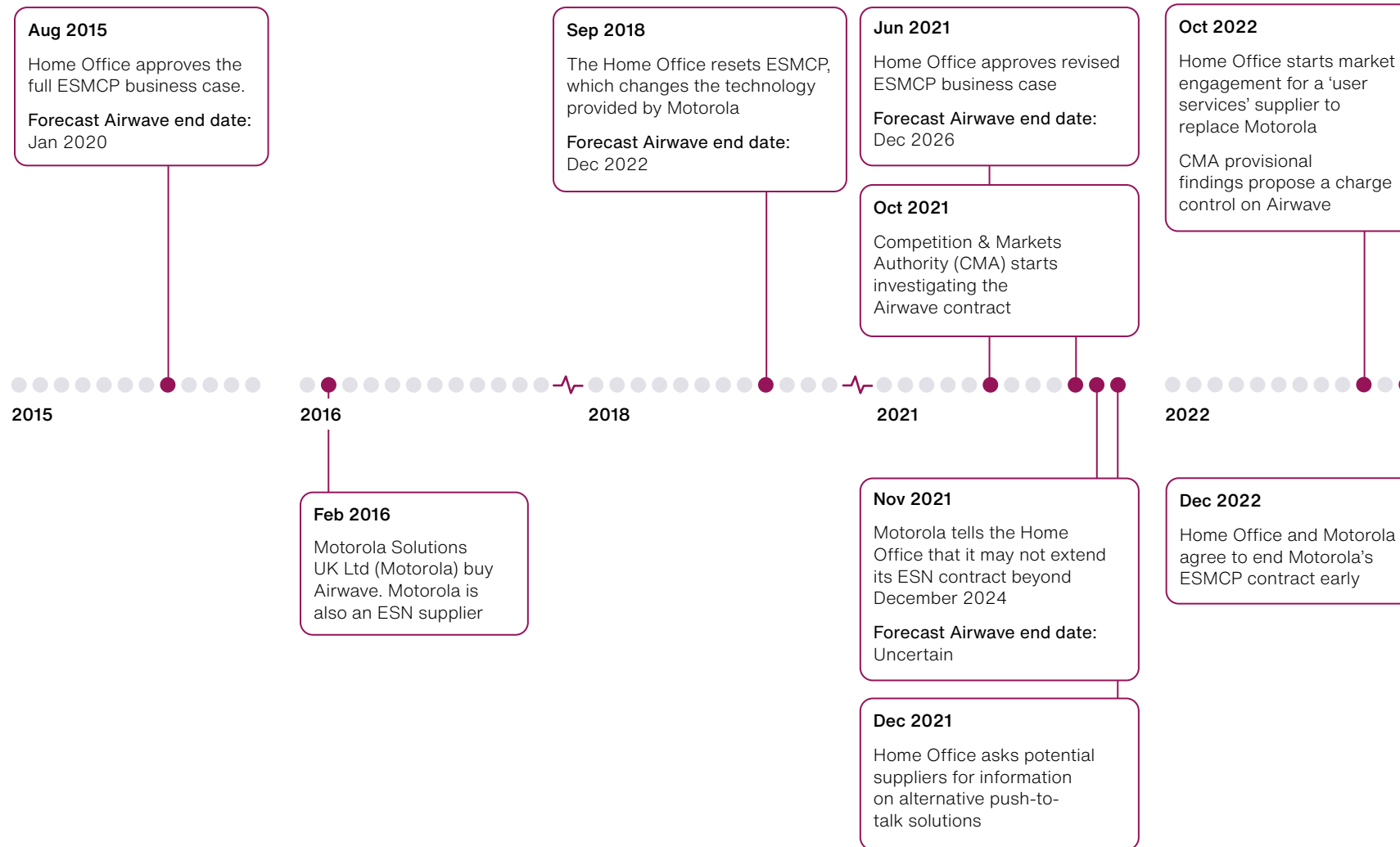
<sup>7</sup> Estimate based on the 2021 forecast, which did not assume any charge control on Airwave. The cost estimates and programme timetable are being updated.



**Figure 2**

Significant developments in the Emergency Services Mobile Communications Programme (ESMCP), 2015 to 2022

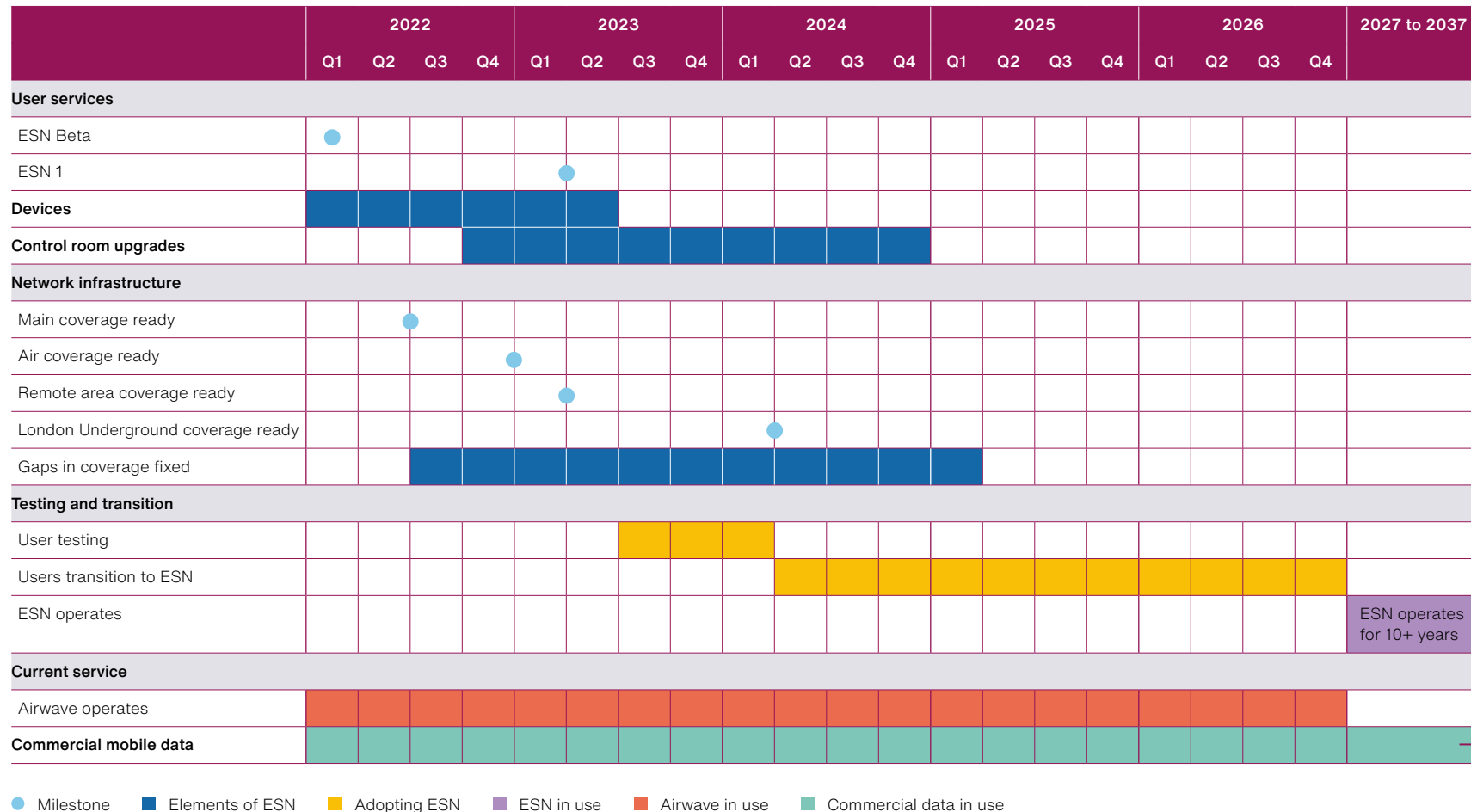
Since 2019 significant developments have affected the programme, pushing back the forecast Airwave end date



Source: National Audit Office analysis of Emergency Services Mobile Communications Programme events

**Figure 3**  
Emergency Services Mobile Communications Programme plan, as at June 2021

The Home Office had expected to undertake the activities needed to introduce the Emergency Services Network (ESN) by the end of 2026



**Notes**

- 'ESN 1' represents the point at which ESN's technology would be ready for final user testing and to start being widely used. 'ESN Beta' was a preliminary version with some of the required functionality.
- The Home Office expects dates to be delayed. Revised dates remain uncertain.

Source: National Audit Office analysis of Emergency Services Mobile Communications Programme business case 2021

**1.7** In October 2022, the CMA published its provisional report, finding that:

- The absence of any alternative option for such a communication network (until ESN is ready) had put the Home Office in a weak bargaining position in negotiations with Motorola.
- Motorola’s dual role as the owner of Airwave and an ESN supplier reduced its incentive to deliver ESN given the significant profits it received from Airwave.
- Airwave’s market power had enabled it to set a price above competitive levels and it had earned significantly higher profits from operating Airwave than from developing ESN. The CMA provisionally estimated that Motorola could be expected to make supernormal profits of around £1.1 billion between January 2020 and December 2026 from operating Airwave. It provisionally proposed to impose a charge control on the revenue that Motorola could earn from Airwave between 2023 and 2029.

Alongside its provisional remedies, the CMA proposed to recommend that the Home Office implement a plan to ensure that the supply of communications network services for public safety would be subject to competitive pricing arrangements, or similar measures, by the end of 2029.

**1.8** Motorola disagrees with the CMA’s findings and has said that it will pursue “all legal avenues to protect its contractual position”. The CMA told us that it expects to publish its final report and decision in April 2023.

## **Progress to date**

**1.9** The Home Office expects ESN to have cost £2.0 billion up to March 2023, which is less than the £2.6 billion it had expected in 2019 (**Figure 4** overleaf). The Home Office told us that it had deliberately slowed down some work on the programme following delays. In addition, it forecasts that £2.9 billion will be spent running and maintaining Airwave, and £380 million on commercial mobile services during that period. As at June 2021, the estimated lifetime cost of the programme, including building and running ESN for 10 years, using and maintaining Airwave until ESN replaces it, and commercial mobile costs, had increased by some 19% to £11 billion. These estimates are uncertain and do not reflect the recent decision to change suppliers, which will require a new programme timetable and increase costs.

**1.10** The Home Office, which has policy responsibility for police in England and Wales and the fire and rescue service in England, pays most of the programme costs. It receives some funding from other organisations including the Department of Health & Social Care (responsible for ambulance trusts in England), the Scottish Government (responsible for all three services in Scotland) and the Welsh Government (responsible for fire and ambulance services in Wales). The users also pay some costs directly.

**Figure 4**

Emergency Services Mobile Communications Programme actual and forecast spend, 1 April 2015 to 31 March 2023

The programme spent less than expected in 2019

	Expected spend (as at 2019)	Latest estimated actual spend <sup>1</sup>
	(£mn)	(£mn)
Main network infrastructure (currently provided by EE)	676	660
Programme management and integration	339	436
Coverage	373	421
User services (previously provided by Motorola)	354	304
Control rooms	72	90
Devices and other costs	534	64
Transition from previous service	157	6
Usage (phone calls and data)	60	-
<b>Total spend on the Emergency Services Network</b>	<b>2,565</b>	<b>1,981</b>
Previous service (Airwave, owned by Motorola)	2,834	2,938
Commercial mobile	349	380
<b>Total spend</b>	<b>5,748</b>	<b>5,299</b>
Contingency	249	-
<b>Total</b>	<b>5,997</b>	<b>5,299</b>
Income	(24)	-
<b>Net cost</b>	<b>5,973</b>	<b>5,299</b>

**Notes**

- 1 Compares 2019 forecast with latest available data from February 2023, which includes forecast spend for 2022-23 and actual spend data for earlier financial years. We have not audited the underlying data.
- 2 Both have been adjusted to show data in 2022-23 terms using Gross Domestic Product deflators (published in January 2023).

Source: National Audit Office analysis of Emergency Services Mobile Communications Programme financial data

## Progress with user services

**1.11** In 2015, the Home Office agreed with Motorola the ‘user services’ contract, which was originally expected to cost £230 million over 6.5 years. This included Motorola providing critical software to allow users a ‘push-to-talk’ functionality to make near-instant calls at the push of a button without having to wait for the recipient to answer. This is not normally supported by mobile phone networks. The contract also included other systems, such as for billing and reporting, needed for ESN to operate.

**1.12** As part of the 2018 reset, the Home Office and Motorola agreed to change the approach to push-to-talk functionality and to use Motorola’s existing Kodiak software, which had previously been used by non-emergency service users. The Home Office agreed a revised contract in May 2019, more than four months later than planned. This required Motorola to iteratively release new versions of Kodiak, which would be incorporated, with work from other suppliers, into ESN ‘products’ for users to test.<sup>8</sup> The Home Office and Motorola expected Kodiak to be able to meet all of ESN’s needs by the end of April 2020. The revised contract, expected to end in December 2024, was estimated to cost £410 million.

**1.13** In April 2021, a consultancy report identified significant failings with how ESN was being developed. It criticised both Motorola and the Home Office for not working collaboratively and Motorola for not providing visibility of the Kodiak development process or supporting infrastructure. It also concluded that the Home Office needed to be more active in managing the product and technology architecture. In June 2022, the Home Office estimated that delays to the final two products, ‘ESN Beta’ and ‘ESN 1’, necessary for ESN to work, contributed to a programme delay of 15 to 27 months. We have not attempted to determine responsibility or to set out an exhaustive list of factors behind the delays to which Motorola and the Home Office will have contributed.

<sup>8</sup> ESN products included three ‘ESN Direct’ products that were critical to building user confidence before the final versions, called ‘ESN Prime’ and ‘ESN Prime+’ were made available. Products were planned to align with new versions of Kodiak. The programme also planned products without Kodiak called ‘ESN Connect’ and ‘ESN Connect+’, and classed projects for air coverage and devices, coverage testing and creation of a software development kit as ‘products’.

**1.14** Some initial versions of Kodiak, provided by Motorola, were completed late and user-testing identified issues, which contributed to programme delays. The Home Office and Motorola have disagreed on whether contractual requirements had been met. For example, Motorola's software did not clearly notify users when calls were cancelled in the way the Home Office had expected. The Home Office considered that these were defects, but Motorola believed that it had complied with the contract specification. In autumn 2021, the security accreditor was concerned that government's security standards were not being fully met, although Motorola felt that it had complied with the standards set out in the contract. In November 2021, when Motorola announced that it may leave ESN in 2024, the Home Office agreed that Motorola had met 85%, by value, of its milestones since the 2018 reset (**Figure 5**). Since November 2021, Motorola has received payment for meeting further milestones alongside recurring payments for having elements available for testing. The Home Office forecasts that it will pay Motorola £304 million (to 31 March 2023) for work on ESN.

## Figure 5

Value and time frame of Motorola's invoices to the Home Office, 2018 to November 2021

Motorola was paid for achieving 85%, by value, of contractual milestones for the Emergency Services Network (ESN) by November 2021

	Contract milestone date	Days from contract milestone to invoice date	Milestone payment (£mn)	Percentage of total value (%)
<b>Milestones achieved as of November 2021</b>				
Testing, system support and other milestones	Between 2018 and 2021	-	105	64
<b>Motorola's software products</b>				
Kodiak 8.4.1	30 August 2018	N/A	10	6
Kodiak 9	31 December 2018	(30)	5	3
Kodiak 9.1	31 October 2019	4	5	3
Kodiak 10	30 April 2020	39	5	3
<b>Programme deliverables</b>				
ESN Assure	7 November 2018	296	3	2
ESN Direct 1	28 June 2019	143	3	2
ESN Connect	31 August 2019	47	1	1
ESN Direct 2	31 August 2020	(4)	5	3
<b>Total</b>			<b>140</b>	<b>85</b>
<b>Outstanding milestones as of November 2021</b>				
ESN Prime	28 April 2021	-	12	7
Post Prime	29 October 2021	-	5	3
Other milestones	Between 2021 and 2022	-	8	5

**Figure 5** *continued*

Value and timeliness of Motorola's invoices to the Home Office, 2018 to November 2021

	Contract milestone date	Days from contract milestone to invoice date	Milestone payment	Percentage of total value
<b>Milestone dates under dispute</b>				
ESN Beta	Not agreed	-	-	-
ESN 1	Not agreed	-	-	-
<b>Total</b>			<b>25</b>	<b>15</b>
<b>Cancelled milestones</b>				
ESN Direct 3	-	-	-	-
ESN Connect+	-	-	-	-
ESN Prime+	-	-	-	-

**Notes**

- Motorola invoices the Home Office once it has provided the work and the Home Office has agreed to accept it. Various reasons could explain the difference between the invoice date and contract milestone date.
- Table shows the status of contract milestones as of November 2021 when Motorola announced that it may not extend its contract beyond December 2024. Motorola received £6.7 million for achieving additional milestones after November 2021. In total, with milestone and other payments, Motorola has been paid an estimated £304 million since 2015.
- 'Programme deliverables' covers products to which a range of suppliers will contribute.
- 'Due date' shows position as of September 2022 and will have changed during the contract. Milestones marked as 'N/A' reflect that some Kodiak versions were available when the contract was signed.
- Dates are based on Home Office information, dates provided by Motorola may differ.
- Totals do not sum due to rounding.

Source: National Audit Office analysis of Home Office data

**1.15** In February 2020, the programme's independent assurance panel reported that the Home Office did not fully test early ESN products as well as it could have, contributing to the delays. This delayed two ESN products by five months and led to the cancellation of a third. The Home Office then decided to produce two new ESN products, known as 'ESN Beta' and 'ESN 1'. The Home Office and Motorola were disputing the milestones associated with these products. Motorola told us they were not incorporated into the contract.

**1.16** On 1 July 2022, Motorola and the Home Office began to negotiate to end the user services contract early. At this point, the Home Office had limited confidence in Motorola's ability to complete the software within the time available. Similarly, Motorola had limited confidence in the Home Office's ability, and considered that the Home Office had introduced an unreasonable number of contract changes.

**1.17** In December 2022, the Home Office and Motorola agreed that the Home Office would pay Motorola £45 million and that Motorola would leave ESN early. This included £27 million to settle outstanding milestones and disputes; £15.5 million to retain access to some infrastructure until December 2023 to facilitate testing; and £2.6 million to enable the Home Office to ensure that ESN works with Airwave. It assessed that this settlement was the quickest and least risky way to exit the contract. As part of the settlement, Motorola agreed not to challenge or directly participate in some future ESN procurements. The Home Office will not use Motorola's ESN work when ESN is operational, but considers that it has obtained some value from it. Motorola has written-off over £120 million given its exit from the programme.

**1.18** The Home Office considered awarding a replacement contract to EE Ltd (EE). This was a contingency option developed in June 2021. In August 2022, after analysing available options, the Home Office decided to reprocure the user services contract instead.

### Progress with ESN coverage

**1.19** ESN needs to be accessible by users across the country wherever they work, including where commercial mobile signals may be weak or unavailable. Almost all users surveyed said that Airwave met their current mobile communication needs at least to some extent, and that they expected ESN to match or exceed this. To establish coverage, various projects need to come together including for:

- the main network, provided by EE which is contracted to ensure that ESN has priority over other users of its commercial phone network and to build 675 new sites;
- 292 remote area sites, expanding coverage beyond the main network, provided by other suppliers;
- 82 sites supporting coverage for aircraft, provided by other suppliers; and
- London Underground coverage for which Transport for London is responsible.

**1.20** Work to establish network coverage, which can progress alongside the user services contract, has proceeded slower than expected and is not complete (**Figure 6**). EE has nearly completed its work on the main network and the Home Office considers that, given delays elsewhere, it remains on target to complete work across the full network before it is required. However, there remains a risk that this work will take longer than planned in 2019. For example, the Home Office still needs planning permission before work can start at 42 of the 292 sites in remote areas.



**Figure 6**

## Status of Emergency Services Network (ESN) coverage, 2022

**The Home Office has more to do so users can access the network**

Coverage needed	Requirement	Complete	Home Office assessment of status	
<b>Main network</b>				
New sites	675 sites	669 sites	● Red	Of the remaining sites, three need planning permission and three are built but not yet in use. EE has identified that it also may need 92 additional sites where coverage is weaker than expected, of which 57 are currently live.
Upgraded sites	20,000 sites	20,000 sites	N/A	N/A
Coverage along roads	218,780 km	218,760 km	● Red	EE's contract does not require coverage on every road, but it predicts that its network covers 541,000 km of the 548,000 km of roads in Great Britain.
Named locations including local metros	71 sites	71 sites	N/A	N/A
Sea coverage	12 nautical miles	12 nautical miles	N/A	N/A
<b>Remote areas</b>	292 sites	0 sites	● Red	42 need planning permission; work not started at 41; work in progress at 197; and 12 are built but not in use.  Several suppliers have responsibility for establishing sites on behalf of the Home Office. EE has been contracted to connect these sites to its network. Other mobile phone operators will be able to use these sites.
<b>Aircraft sites</b>	82 sites	0 sites	Not reported	20 sites need planning permission; work not started at 15; work in progress at 19; and 28 are built but not in use.
<b>London Underground</b>	All underground stations and tunnels	Not reported	● Red	Low level design completed. 87% of 422 km cable has been laid. TfL has let a contract to provide infrastructure on platforms, with work expected to complete in 2024.

**Note**

1 'Red', 'amber' and 'green' mean milestones are likely to be missed (or have been missed); at risk; or are on track respectively. The Home Office considers that a 'red' status would not delay the whole programme because it does not assess that these activities are on the critical path.

Source: National Audit Office analysis of programme information

**1.21** The Home Office cannot fully quantify the current gap between coverage provided by Airwave and ESN. In 2017, users identified some 21,000 locations where ESN coverage may be required. Since 2018, the Home Office has been collecting data on gaps and has set up a process for users to report gaps. Based on predictions, it considers that it has a clear understanding of where there is coverage but these predictions cannot yet be fully tested. It considers that the actual coverage gap is likely to be smaller than expected in 2017, but it does not aggregate its data. The programme will need to agree with suppliers the work needed to resolve any gaps and who will pay for this.

### Progress creating handsets and devices

**1.22** To use ESN, users will need handsets for individuals and devices in vehicles and aircraft. The Home Office no longer has a contract to receive a customised handset. As part of the original contract, Samsung had provided the Home Office with handsets, however, the final model will not be supported beyond 2023. Samsung told us that, due to the long time frames for testing whether handsets worked with the software, it would not be feasible to introduce a replacement handset before its contract ended. Therefore, Samsung exercised its ability to terminate its contract in September 2022. Because the handset must work with the systems and software provided as part of the new user services contract, the Home Office expects the new supplier to provide a handset for testing. It is unclear which handset will be used when ESN becomes operational.

**1.23** In 2019, the Home Office let contracts for providing devices in vehicles and aircraft and this work is at an early stage. We have previously noted that there was no market for device-to-device communication and there is no visible progress.

### Progress upgrading control rooms

**1.24** Control rooms allow organisations to make and receive calls, use data, and decide what action to take. In 2019, we found that the Home Office will not be able to switch Airwave off until all control rooms are upgraded, which depends upon work done by the emergency services and their suppliers. In 2019, the Home Office had no way to ensure that this work aligned with ESN plans.

**1.25** Since 2019, the Home Office has agreed contracts with five vendors to ensure that the main control room systems they sell will be upgraded to work with ESN. Motorola, who also sells control room systems, declined to sign a contract but stated that it would work cooperatively with the programme. The contracts, let between 2019 and 2022, will make available a control system product that assumes that ESN uses Motorola's technology. Users will then need to purchase and install the upgraded systems. Vendors had restarted upgrading systems for ESN following the 2018 reset and the Home Office had begun work with nominated user organisations to test how systems integrated with ESN. This testing, along with the vendors' upgrades, may need to be reworked when the new user services contract is in place.

**1.26** The Home Office does not have a full understanding of the work needed to upgrade all control rooms. As well as the main systems, control rooms use an unknown number of other systems that link to Airwave and will need upgrading. The Home Office does not know how many vendors provide these systems.

### Maintaining Airwave

**1.27** Users will continue to use Airwave until ESN is ready. The Home Office plans to extend the Airwave contract beyond 2026, guaranteeing that users can access Airwave, but it has yet to start negotiating the terms. This will be the third extension and will potentially cost more than £250 million per year. The Home Office had previously agreed only short-term extensions of three and four years. Almost all users surveyed said that they would need to replace Airwave devices over the next three years, and some told us that they may need to replace control room systems, which will then be upgraded for ESN. The Home Office recognises that it must maintain a relationship with Airwave's owner, Motorola, to continue using Airwave. This may be more challenging because any remedies decided upon by the CMA could affect the Home Office's and Motorola's relationship.

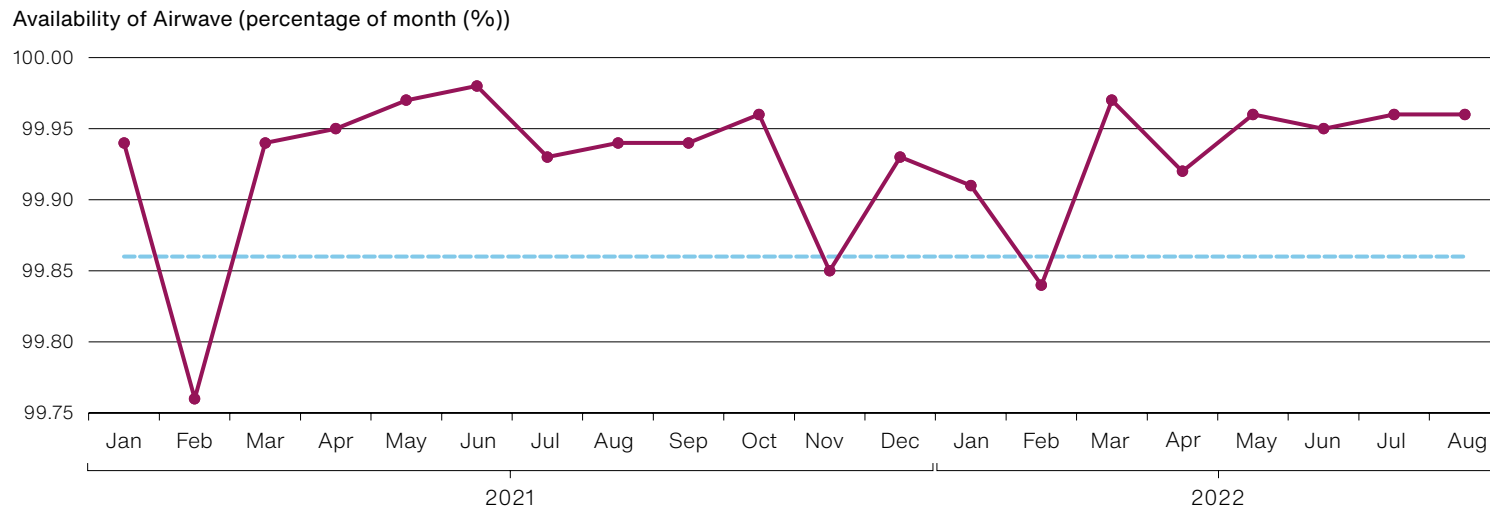
**1.28** Airwave continues to perform well (**Figure 7** overleaf). It generally exceeds agreed levels of availability although performance can be affected by the weather. Almost all users surveyed reported that Airwave met their needs at least to some extent. However, many commented that Airwave did not meet their modern data needs, with the majority supplementing it with commercial data contracts.

**1.29** Although Airwave will need to be replaced in the future, we have seen no evidence that with some investment Airwave cannot continue to meet users' needs for voice communication into the 2030s. Some countries have started to move away from using Airwave technology, but others continue to use it. Motorola is confident that Airwave can continue to be used well into the next decade with adequate investment, and it is continuing to invest in mobile radio technology. The Home Office told us that it expects components to need replacing by 2030 and that, over time, people with the skills to work on Airwave may be harder to find. However, it cannot determine the point beyond which Airwave cannot be used and considers that it cannot take the risk of remaining on Airwave.

**Figure 7**

Airwave performance, January 2021 to August 2022

Airwave has generally exceeded its contractual performance level of 99.86% availability



● Availability (%)	99.94	99.76	99.94	99.95	99.97	99.98	99.93	99.94	99.94	99.96	99.85	99.93	99.91	99.84	99.97	99.92	99.96	99.95	99.96	99.96	
■ Target (%)	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86	99.86

**Note**  
 1 Where performance has dropped below the contracted performance level, this has largely been due to extreme weather.

Source: National Audit Office analysis of Home Office data

## Part Two

### Risks and issues facing the programme

**2.1** The Home Office recognises the Emergency Services Mobile Communications Programme (ESMCP, or the programme) as high risk. We have previously highlighted various risks, particularly around the technology, commercial approach, user engagement and programme management. Our assessment of risks and issues has evolved over time (**Figure 8** overleaf). This part gives our current assessment of risks in light of the programme's uncertainties.

#### Commercial and contractual risks

**2.2** In our previous reports, we found that the Emergency Services Network (ESN) has a complex set of commercial relationships. The Home Office is now changing its main contracts for user services, previously contracted to Motorola Solutions UK Ltd (Motorola), and the main network, currently contracted to EE Ltd (EE).

#### The user services contract

**2.3** There is a risk that the Home Office is unable to let the new user services contract or that it takes longer than expected. When the contract was first let in 2015, the Home Office could only find one supplier, Motorola, willing to take on the contract. In 2022, the programme's independent assurance panel re-assessed the market and concluded that suppliers were investing in the technology that ESN needed.<sup>9</sup> The Home Office began market engagement to identify a replacement for Motorola in October 2022. The new supplier will not have the same conflicting incentives as Motorola, who owns Airwave.

**2.4** The Home Office told us that it assesses the risk of not identifying a supplier as low because alternative technology is available, but it has not yet been able to fully test this assessment. It told us that it has identified several potential suppliers, which may need to form consortia to bid, and it therefore concluded that not finding a supplier was a low risk. It will not know with certainty whether it can find a supplier until bids are received, currently expected in mid-2023, with contracts awarded by April 2024. The proposed 18 months' time frame is longer than it expected when it first began the procurement. Any delays will have an impact on the whole programme.

<sup>9</sup> The independent assurance panel, which undertook its first work in 2019, was created to provide continuous scrutiny.

## Figure 8

National Audit Office summary of changes to the Emergency Services Mobile Communications Programme's risks, 2016, 2019 and 2023

Most of the risks identified in 2016 remain

	2016 assessment <sup>1</sup>	2019 assessment <sup>2</sup>	Current assessment (2023)
<b>Technology risks</b>			
Emergency Services Network (ESN) requires bespoke technology that may not work	Technology would be world-first, with some parts not existing	Technology changed with some elements unproven	Technology market widened with some other countries adopting a similar approach. But, as technology evolves, it is untested in real-world conditions at any significant scale
Security standards need to be met	Unclear if ESN will meet needs of most security-conscious users	Security accreditation not in place	In 2021, there were concerns that security standards were not being met
Aspects of ESN need integration	Reliant on contractor	Not yet clear how the various elements of ESN will work together	Home Office has recognised that it has formal responsibility and needs to formally assess if it has the required skills
<b>Commercial risks</b>			
Contract structure ineffective	Attempting to pass delivery risk to suppliers	Main contracts being revised	Main contracts being replaced
Motorola's dual role disincentivises performance	Motorola role carries significant risk	Role of Motorola needs careful management	Motorola being replaced
<b>User risks</b>			
Users may be unwilling to use ESN	Mixed perception among users	Users expressed concerns with adopting ESN	Confidence rebuilt but at risk
Live service arrangements required	Users lack control over the service they receive, so may use other services instead	Unclear who will manage ESN to deliver a service to users	Work to decide how ESN will be managed is paused. Many user organisations have supplemented Airwave to use data
<b>Programme and outcome risks</b>			
Uncertain timetable	Ambitious plan to deliver by 2020	No coherent plan yet to deliver by 2022	Plan being revised, with uncertain timetable
Capability gap	Positive delivery-focused culture with low turnover	Many staff left the programme	Programme risks losing specialist expertise. Staff morale is a recognised risk
Reduced benefits	Optimism on benefits	Benefits reduced	Benefits uncertain and likely reduced

### Notes

1 Comptroller and Auditor General, *Upgrading emergency service communications: the Emergency Services Network*, Session 2016-17, HC 627, National Audit Office, September 2016.

2 Comptroller and Auditor General, *Progress delivering the Emergency Services Network*, Session 2017-2019, HC 2140, National Audit Office, May 2019.

Source: National Audit Office analysis

**2.5** The Home Office recognises its commercial approach, which has contributed to challenges across the programme, as suboptimal but decided to continue this to avoid further programme delays. The approach allocates responsibilities between contracts in a way that the programme's independent assurance panel found did not align with how the telecommunication market generally worked. In September 2021, the Home Office asked EE and Motorola to start considering how work could be moved between the two contracts. This work was not completed. When assessing its options to replace Motorola, in June 2022 the Home Office initially preferred to establish a prime ESN supplier rather than replacing the user services supplier alone. However, in August 2022, it decided to discount this approach as a full reprocurement of all contracts would delay the programme by three years. It will now recompetes the user services contract alone and maintain the commercial approach which it considers workable.

**2.6** The Home Office has not changed the overall user services contract structure. To help build users' confidence in ESN being as good as Airwave, the Motorola contract attempted to specify in detail how the push-to-talk software should work. We have previously found that government digital projects need a flexible contracting process that recognises that scope and requirements may change.<sup>10</sup> The Home Office told us that to maintain user confidence and to avoid delaying the procurement, it accepts the risk that overly rigid or ambiguous requirements may lead to contractual disputes and the need for flexibility to respond to user feedback. The Home Office has started to identify detailed lessons to improve the contract.

### The main network infrastructure contract

**2.7** In 2015, the Home Office originally let the main network infrastructure contract to EE for six years to December 2021, with a potential year's extension. It intended for this contract to be subject to future competition, with short-term contracts to avoid being locked into a single supplier and help take advantage of innovation. As part of the 2018 programme reset, the Home Office extended the contract to December 2024. It now considers that, to avoid delaying the programme, it must award EE a new contract, without competition, thereby extending EE's involvement in ESN. A direct award may be subject to a higher risk of challenge, which would then delay the programme. The Home Office has accepted the risk and intends to recompetes the contract when the extension ends, and allow for a restructuring of commercial arrangements in the future.

### Technology risks

**2.8** Developing and introducing new technology at scale for a range of users is inherently challenging. We have previously reported on the challenges of implementing digital change across government, including how systemic risks can arise from the technology solution chosen.

<sup>10</sup> Comptroller and Auditor General, *The challenges in implementing digital change*, Session 2021-22, HC 575, National Audit Office, July 2021.

## Introducing technology that works

**2.9** In 2019, we reported that the ESN technology had not yet been proven in real-world conditions, with risks that parts of the system would not be available in time. These risks remain as the planned testing of ESN at scale could not happen in 2021.

**2.10** In other countries, emergency services are beginning to take a similar approach to ESN, but there are still no examples of a system being used at the scale required by UK users. The Home Office considered Motorola's Kodiak technology as market-leading and there is a risk that any alternative may require significant development to be suitable. In 2021, the programme's independent assurance panel identified eight countries adopting a similar strategy and moving to using public mobile networks with some piloting solutions. This will give the Home Office confidence that it has the right approach but does not yet prove that ESN will work at scale. The new user services contract will be the third attempt to procure push-to-talk technology and make it work to the standards and scale expected by users.

## Connecting the different parts of ESN

**2.11** As with most digital programmes, components need to work seamlessly together ('systems integration') for ESN to work. For example, the push-to-talk technology needs to integrate with devices and the mobile network.

In February 2022, the programme board rated technical integration as 'red', given the risk that performance issues may not be discovered until it is too late to resolve them.

**2.12** In our 2019 report, we found that the Home Office was unclear as to how the different elements of ESN would be made to work together, and did not have the capability it needed to fulfil its role. We recommended that the Home Office set out responsibilities for technical integration. In 2015, it had awarded a contract to support integration but its management of the contract had left it responsible for undertaking and assuring this work. It has since recognised that it has formal responsibility, but it has not yet formally assessed whether it has the design, architecture and integration skills needed. It has relied on suppliers to provide specialist skills. In April 2021, the software consultancy appointed to review the user services contract (paragraph 1.13) found that the Home Office needed to take more responsibility and accountability for ensuring technical alignment across ESN. Technical integration will be harder:

- Without a clear technical architecture (design) for how the parts of ESN will work together. In a report on the user services contract, consultants stated that "we did not observe the level of architectural clarity and alignment we would expect to see in a programme of this scale". The Home Office considers that it has extensive technical architecture documentation covering the whole programme.



- Where existing work does not meet expected standards. As part of the 2018 reset, Motorola agreed to provide push-to-talk technology that complied with telecommunications standards. The Home Office has confidence that this risk has been mitigated, but cannot yet tell if this has been the case.
- If the new supplier takes responsibility for systems integration without clarity about their role or authority to manage suppliers.

**2.13** In 2019, using a framework, the Home Office let a management consultancy contract to Deloitte for delivery and advisory services. After being extended, this contract is now expected to end in May 2023. The Home Office then intends to let a new contract for in-depth technical expertise, with a different scope, through an open competition.

## User take-up risks

### User confidence

**2.14** The successful implementation of the programme depends on buy-in and engagement from user organisations. Users need confidence in the programme's direction to start the work needed to transition to ESN, and then in ESN itself to start using it. Since April 2021, the Home Office has continued to identify user confidence as a significant risk. It assessed the risk as having slightly reduced in August 2021, following the programme board's approval of the business case, but then increased its rating in April 2022 after independent analysis identified a fall in confidence among 60% of user organisations. The Home Office feels low user confidence is influenced by:

- limited visibility of progress, although most of our survey respondents reported that they felt fairly or very well-informed about progress; and
- uncertainty about how much they would need to spend to prepare for ESN, as highlighted in our 2019 report.

**2.15** The Home Office's approach for mitigating the user confidence risk includes establishing a realistic plan and demonstrating consistent delivery to time and scope against the plan. Risk reports show that the Home Office has not updated this approach since the start of 2022 despite the deterioration in confidence reported in April. These actions will be difficult to implement given current uncertainties about the programme's plan, and the Home Office has forecast that such mitigations will only reduce the risk slightly.

**2.16** User organisations have more confidence in the current programme leadership, appointed since summer 2020. Representatives of police and fire users told us they previously had little confidence in the programme but now had an improved relationship with leaders who better understood their needs. Along with representatives from Police Scotland, the Scottish Fire and Rescue Service and the Scottish Ambulance Service, the police user representative told us that they were at least to some extent confident in the current leadership taking on board their views and needs. Our survey of English fire and rescue services showed that this was the view of 41% of the 36 responding to our survey (**Figure 9**).

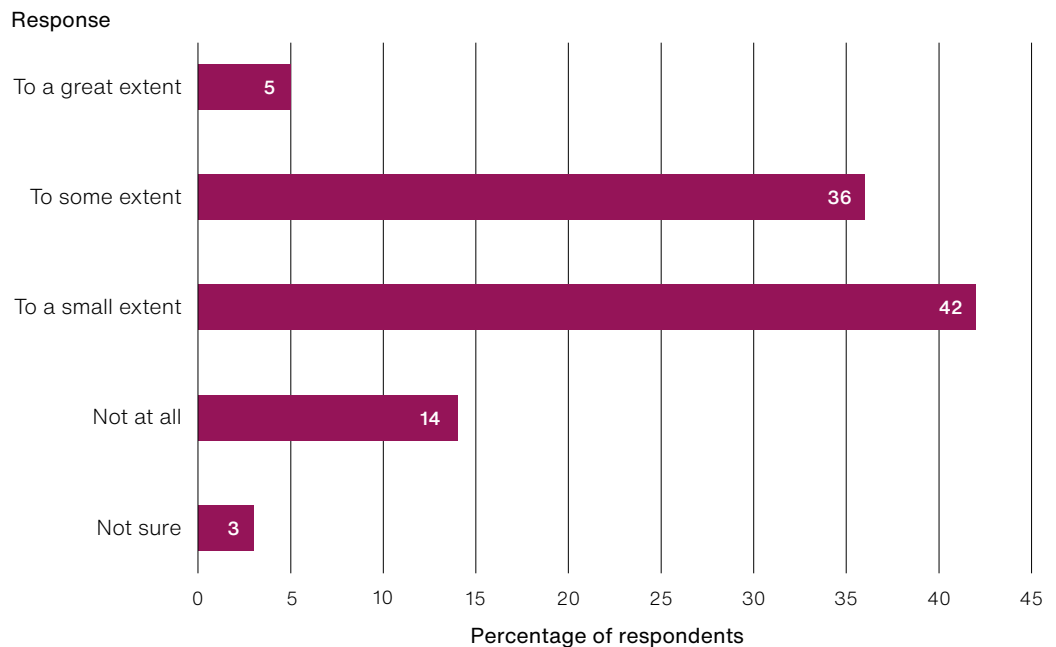
### Understanding conditions for transition and replacing Airwave

**2.17** For users to start using ESN, the Home Office intends for it to support the safety of the emergency services and for it to be ‘equivalent to Airwave’. There is a risk of delay if some users are unconvinced that these conditions have been met.

**Figure 9**

Survey responses from England fire and rescue services on confidence in the leadership of the Emergency Services Mobile Communications Programme (ESMCP), autumn 2022

**Most fire service respondents have some confidence in the ESMCP leadership**



**Notes**

- 1 Chart shows responses to the question “To what extent does your organisation have confidence in the current leadership to take on board the views and needs of users?”.
- 2 Based on 36 out of a possible 44 responses, giving an 82% response rate.

Source: National Audit Office analysis of England fire and rescue survey responses

**2.18** The Home Office has set out some 1,464 detailed requirements that must be met before users will agree that ESN can fully replace Airwave. These cover the capabilities they require including coverage, resilience, security, and health and safety standards. Achievement of these requirements will be assessed through two stages of acceptance criteria comprising:

- minimum transition standards and capabilities required for users to operate ESN at scale; and
- Airwave exit criteria whereby users decide that they can rely on ESN as the sole communications system and therefore turn off Airwave.

**2.19** The Home Office has made progress in agreeing acceptance criteria with users and making sure that these are understood. It revised these, first agreed in 2017, in August 2019 following the programme's reset. It expects to make further updates once users start to test ESN. Most survey respondents reported that they had a fairly or very good understanding of the criteria for both transitioning to ESN and turning off Airwave (**Figure 10** overleaf).

**2.20** As suggested in our previous reports, given the complex network of users and approvals, getting users to accept ESN as a replacement for Airwave is inherently difficult. Even if ESN satisfies all the acceptance criteria, users have not made a binding agreement with the Home Office to use ESN, which creates a risk that individual organisations will decide that they do not want to use it. The Home Office expects that, once ESN has been tested, assured and shown to meet acceptance criteria, national police representative bodies will make a nationwide recommendation to use ESN. Users will then need to decide locally as to whether to start transitioning to ESN. The Home Office has assessed service acceptance as a high risk since at least April 2021, acknowledging that ESN may not match user expectations.

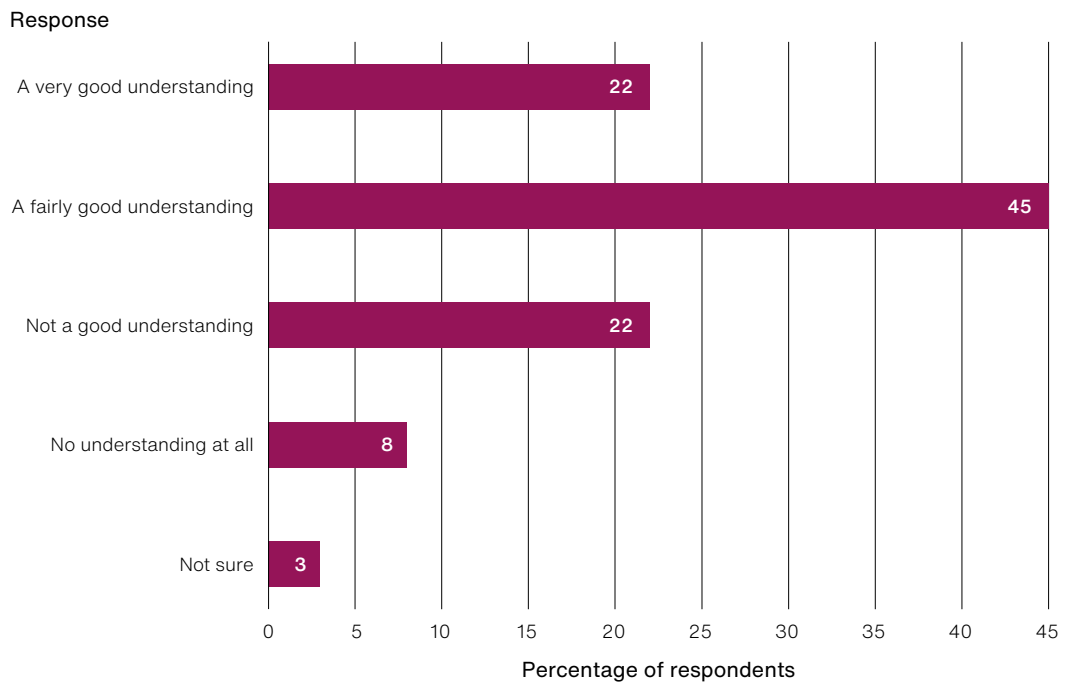
**2.21** Most respondents to our survey had at least some confidence that ESN would meet their needs (**Figure 11** on page 35). Most England fire and rescue respondents (70%) were at least to some extent confident that ESN coverage would be as good as Airwave, while over half (55%) were at least to some extent confident that ESN would be as resilient.

**2.22** Transition planning generally remains in the early stages and current delays create uncertainty around how much can be done now. Most survey respondents said that they are making plans for, or are in the process of, upgrading control rooms but have made little to no progress on providing training to staff who will use ESN or on changing operational procedures. In autumn 2022, police and fire representatives told us that user organisations were temporarily disbanding dedicated ESN teams due to the uncertainties around ESN. There is a risk that users will not be able to scale up teams when needed, particularly if users need to recruit new staff with specialist skills.

**Figure 10**

Survey responses from England fire and rescue services on the conditions for transitioning to the Emergency Services Network, autumn 2022

**Most fire service respondents have a fairly or very good understanding of the conditions for turning off Airwave**



**Notes**

- 1 Chart shows responses to the question “How much of an understanding does your organisation have of the conditions under which you would be comfortable to turn off Airwave?”.
- 2 Based on 36 out of a possible 44 responses, giving an 82% response rate.

Source: National Audit Office analysis of England fire and rescue survey responses

**Programme management risks**

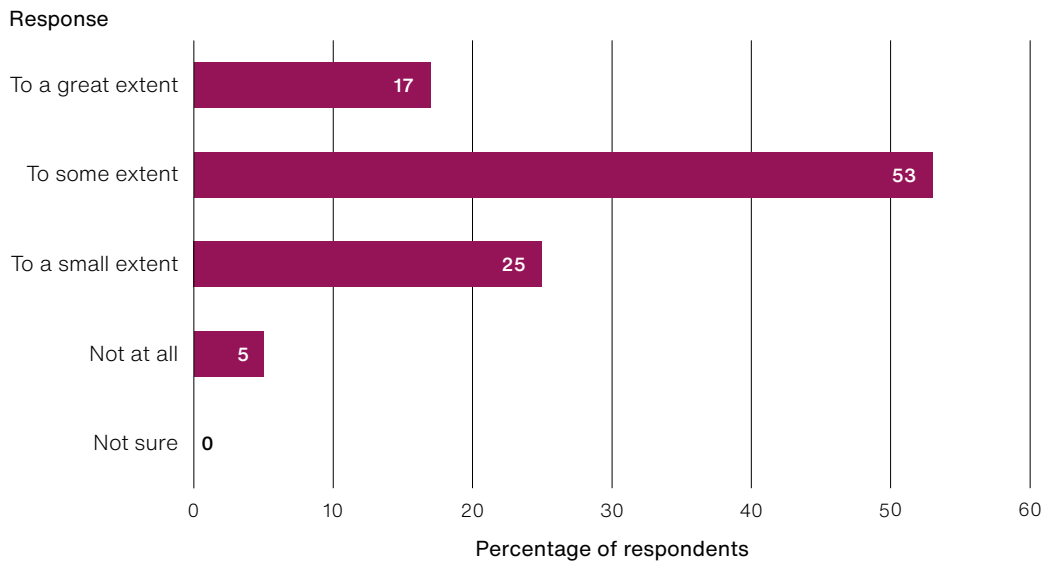
Risk reporting and management

**2.23** The Home Office recognises the programme as high risk. Since April 2021, most risks reported to the programme board have consistently been assessed as the highest or second highest risk category (**Figure 12** on pages 36 and 37). The Home Office also reports issues to the programme board. These include issues relating to the user services contract, which have been raised since November 2020.

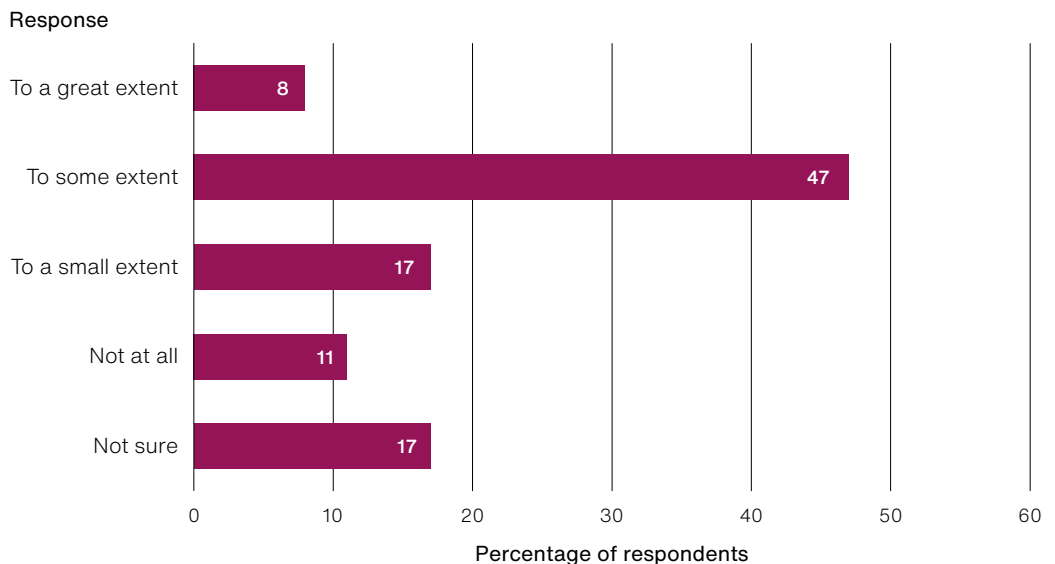
**Figure 11**

Survey responses from England fire and rescue services on confidence in the Emergency Services Network (ESN), autumn 2022

**Most fire service respondents have some confidence that ESN will provide coverage that is as good as Airwave**



**Most fire service respondents have some confidence that ESN will provide a level of resilience that is as good as Airwave**



**Notes**

- 1 First chart shows responses to the question “To what extent is your organisation confident that ESN will provide coverage that is ‘at least as good’ as the current Airwave system?”.
- 2 Second chart shows responses to the question “To what extent is your organisation confident that ESN will provide a level of resilience that is ‘at least as good’ as the current Airwave system?”.
- 3 Both charts are based on 36 out of a possible 44 responses, giving an 82% response rate.

Source: National Audit Office analysis of England fire and rescue survey responses

**Figure 12**

Summary of the Emergency Services Mobile Communications Programme's risks raised with the programme board, April 2021 to September 2022

The Home Office recognises the programme as high risk and has not been able to significantly reduce its risks

Risk/issue	Description	Rating <sup>1</sup> of risk/issue at programme board meeting								
		2021				2022				
		Apr	Jun	Aug	Oct	Jan	Feb	Apr	Jun	Sep
<b>Technology</b>										
Kodiak technology	The version of Kodiak contracted for may not meet programme needs	Not reported	Not reported	Not reported	Not reported	RISK	ISSUE	ISSUE	ISSUE	Not reported
Other technology	For example, coverage, control rooms, devices and the air project may not be ready	RISK	RISK	RISK	RISK	RISK	RISK	RISK	RISK	RISK
Requirements	The programme fails to get service acceptance of the Emergency Services Network (ESN) solution. ESN may fail security requirements	ISSUE	Not reported	RISK	RISK	RISK	RISK	RISK	Not reported	Not reported
<b>Commercial</b>										
Supplier performance and relationship	Supplier underperformance and deteriorating relationship following the Competition & Markets Authority report	ISSUE	ISSUE	ISSUE	ISSUE	ISSUE	ISSUE	ISSUE	ISSUE	ISSUE
<b>User</b>										
User confidence	Low user confidence may lead to a lack of support for the programme	RISK	RISK	RISK	RISK	RISK	RISK	RISK	RISK	RISK
Mass deployment	The programme may not be able to deploy at the scale required	RISK	RISK	RISK	RISK	RISK	RISK	RISK	Not reported	Not reported
Live service	The programme may not be ready to run ESN as a live service	RISK	Not reported	RISK	RISK	RISK	RISK	RISK	Not reported	Not reported
Disaster recovery	A disaster may reduce resilience	RISK	Not reported	RISK	RISK	RISK	RISK	RISK	RISK	RISK
<b>Wider programme</b>										
Affordability	There is a misalignment between the budget and spend profile	RISK	RISK	RISK	RISK	RISK	RISK	RISK	RISK	ISSUE
Programme plan	The plan needs to be updated	ISSUE	Not reported	ISSUE	ISSUE	ISSUE	ISSUE	ISSUE	Not reported	Not reported
Recruitment	Long time to recruit civil servants	Not reported	Not reported	Not reported	Not reported	ISSUE	ISSUE	ISSUE	Not reported	Not reported
Staff morale and skills	Changes to the programme affects staff morale. Reducing the number of contracted staff reduces technical capability	Not reported	Not reported	Not reported	Not reported	RISK	RISK	RISK	RISK	ISSUE

■ Risk/issue of critical objectives not being achieved   
 ■ Risk/issue of stated objectives falling below acceptable levels  
■ Risk/issue of objectives falling below goals but being above minimum acceptable levels

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**Figure 12** *continued*

Summary of the Emergency Services Mobile Communications Programme's risks raised with the programme board, April 2021 to September 2022

**Notes**

- 1 The programme board meets roughly every eight weeks.
- 2 Risk and issue ratings reflect actual assessments before considering any potential mitigation. Ratings are colour-coded ('red', 'amber/red', 'amber', 'green') based on likelihood and impact. 'Green' represents a risk/issue of objectives falling below goals but remaining significantly above minimum acceptable levels.
- 3 Figure shows the main risks reported to the board at each meeting. Where we have combined similar risks, we have taken the highest risk rating.

Source: National Audit Office analysis of data reported to the programme board

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**2.24** The Home Office has generally improved its programme board risk reporting, but information is sometimes inconsistent and incomplete. The programme reports its top risks and their ratings, but these do not consistently include descriptions of each risk; cause and impact; planned mitigation actions; or predicted post-mitigation ratings. This information is included in the more detailed monthly risk registers and in some reports to the programme board but is missing from other reports.

**2.25** Risk reporting also does not include how successful actions have been in reducing or managing risks and many risks have crystallised or become more challenging. For example, the Home Office rated the risk of inadequate funding as the second-highest risk category since at least April 2021, increasing it to the highest category in June 2022 and reporting it as an issue in September 2022, implying ineffective mitigation actions.

### Skills and capabilities

**2.26** A complex programme like ESMCP requires technical and programme management skills. In April 2021, the Government Internal Audit Agency reported on the Home Office's management of the user services contract and found that there was a suitable team with appropriate skills, knowledge and experience to manage the programme and Motorola contract. The Home Office told us that it now has increased confidence in the programme's leadership. This followed the Home Office appointing a new programme director in 2020 and a new senior responsible owner (SRO), who has a policing background, in March 2021. It told Parliament that it intends for SROs to have responsibility for only one major programme but, from June 2022 to February 2023, the ESMCP SRO was given temporary responsibility for the National Law Enforcement Data Programme, another complex digital programme.

**2.27** From January 2022, the Home Office reported that reducing the number of contracted staff created a risk of losing specialist expertise, and that the long time to recruit civil servants remained an issue. The Home Office told us that it is confident that the programme currently has the right skills and capabilities but acknowledges that there are challenges recruiting civil servants due to wider headcount limits.

### Running ESN as a live service

**2.28** Users will not realise the benefits of ESN until it is operational and the Home Office has yet to make progress in deciding how it will work. It developed a draft plan, but this work has been paused while the user services contract is reprocured.

### The strategic case for the programme

**2.29** As delays with the user services contract, and its subsequent reprocurement, will affect the timetable and costs, the Home Office is developing a revised business case that it expects to approve in 2024. As part of this, it will reassess the strategic case to provide assurance that the programme remains the most appropriate use of taxpayers' money. The business case will also outline the revised timetable and costing. The Home Office told us it would set a realistic timetable for the programme, not necessarily led by the end of the Airwave contract.

**2.30** As set out in the 2015 business case, the programme's original objectives were to save money and bring mobile data to emergency services. Since then:

- Should the Competition & Markets Authority (CMA) impose a charge control on the Airwave service it would reduce potential financial savings from the programme. The CMA has not yet determined whether there is an adverse effect on competition and, if so, whether a charge control is required. However, in its October 2022 provisional decision, it estimated that the taxpayer could save at least £150 million a year between 2023 and 2029. Any financial saving will not be a programme benefit. Further ahead, our preliminary analysis of Home Office data suggests that the programme could still save over £200 million per year after 2029, but it will take at least 10 years to recoup the cost of the programme. Motorola has suggested that should a charge control at the levels initially suggested in the provisional decision be implemented, this would have a disproportionate impact, creating more problems than it is there to solve.



- Estimated productivity benefits will fall as users have developed their own approaches to using mobile data. User representatives told us that most police forces do not have a great interest in the data products that the programme will provide, given that they already use data, including through commercial contracts. Most survey respondents had introduced their own alternatives. The 2015 business case expected over £3 billion of benefits, but by 2019, this had been reduced to £1.5 billion and is expected to fall further.<sup>11</sup> The programme no longer expects to provide any apps, other than to enable push-to-talk, so the programme will not directly lead to any productivity gain for users. The programme still provides a common platform and priority access for data. These benefits will be difficult to measure but, should users have different data contracts, it will be harder for the Home Office to standardise approaches which will have an impact on data and security risks.

<sup>11</sup> Net present value of benefits expected between 2015 and 2037. For consistency, the 2015 figure has been extrapolated to account for the change in programme timetable following the 2018 reset.

# Appendix One

## Our evidence base

**1** We produced this report on the Emergency Services Mobile Communications Programme (ESMCP, or the programme) to deliver a new communication network (Emergency Services Network, ESN) after analysing evidence collected between September 2022 and February 2023. This enabled us to provide a factual update on the programme's progress since our last report in 2019, set out the remaining programme risks, and reach our independent conclusions and recommendations for the Home Office.

### **Document review**

#### Focus and purpose

**2** We reviewed key programme documents to understand the programme's progress and risks. These documents included:

- business cases and approvals;
- the programme's financial model;
- programme board papers;
- commercial documents;
- resourcing documents;
- planning documents;
- risk management documents;
- technical documents;
- stakeholder analysis;
- lessons learned documents;
- the programme's independent assurance panel's reports;
- Infrastructure and Projects Authority reports;
- Government Internal Audit Agency reports;

- an independent remediator's report on the causes of the delays delivering ESN;
- Competition & Markets Authority (CMA) publications, including submissions, working papers and the provisional decision report; and
- previous (2016 and 2019) National Audit Office (NAO) reports on ESN.

### Analytical approach

**3** We reviewed each document to help us better understand the Home Office's progress with ESN and key programme developments since our 2019 report, and to inform our view of the programme's risks and issues. Where necessary, we followed up with the Home Office to get clarification on the contents of the documents and to request further documents as required. We also used our document review to inform our interview questions and to confirm the findings from interviews.

### Interviews

#### Selection

**4** We interviewed the programme team (Home Office civil servants and contractors); suppliers contracted to deliver ESN; and representatives of the emergency services, to further our understanding of the programme. We interviewed people working in the following areas of the programme:

- finance;
- commercial;
- ESN as a live service;
- overall technical solution;
- technology, including for devices, control rooms and the air-to-ground network;
- governance and project management office;
- resourcing, skills and capabilities;
- security;
- coverage;
- deployment and user engagement; and
- contract management of Airwave.

**5** We also interviewed people outside the Home Office including from:

**Main suppliers**

- Motorola.
- EE.
- Samsung.

**Emergency services organisations**

- National Police Chiefs' Council.
- National Fire Chiefs Council.
- Representatives of the Scottish and Welsh emergency services.

**6** We also interviewed the CMA to further our understanding of its provisional decision from its market investigation.

**7** Interview topics included:

- the role of the team in the programme;
- developments in the team's work and current status;
- the team's views on the remaining programme risks; and
- lessons learned.

**Survey of emergency services organisations**

Focus and purpose

**8** To ensure we gathered a comprehensive range of insights and perspectives on the programme, we conducted a survey of emergency services organisations that covered:

- users' experience of, and views on, the current Airwave system;
- users' understanding of the programme;
- users' confidence in the programme;
- users' views on the value of ESN; and
- plans for transitioning to ESN.

## Survey design and dissemination

**9** The user survey mainly consisted of multiple-choice questions to allow for some degree of quantitative analysis. We also included open follow-up questions, where respondents could give free-text answers, to give us a more detailed understanding of users' views.

**10** Our draft survey questions were reviewed by the NAO survey team before being sent out to user organisations on 12 November. We closed the survey on 9 December 2022.

**11** The survey was sent to lead user representatives of the emergency services across England, Scotland and Wales, and we requested a representative response from, or on behalf of, each user organisation. However, as some emergency services' ESN teams had been temporarily disbanded by the time the survey was sent out, we took a hybrid approach whereby we received:

- 36 out of a possible 44 responses from England fire and rescue services, giving an 82% response rate;
- one representative response for the 43 England and Wales police forces;
- one representative response for the 11 England ambulance services; and
- responses for Police Scotland, the Scottish Fire and Rescue Service and the Scottish Ambulance Service.

## Analytical approach

**12** We analysed the survey findings by looking at the distribution of the responses across the various options given. These findings have been used to inform our report, but we have only presented responses for the England fire and rescue services as percentages or in figures because we consider that the response rate is high enough to provide a representative view.

## **Financial analysis**

### Analytical approach

**13** We analysed financial data from the programme's financial model, and latest available data on actual spend from February 2023, to understand the programme's total cost and how this has changed since the previous 'reset'. We compared spend as expected in 2019, shortly after the programme's previous 'reset' and when we last reported, with the latest available data on actual spend. We analysed spend up to 31 March 2023 to align to the end of the current financial year, which falls very soon after our publication date. We aggregated this spend to align with the main elements of the programme. We converted all costs to real terms using Gross Domestic Product deflators published in January 2023 to ensure comparability.

### Limitations

**14** The latest programme financial model is from 2021 and a revised forecast has not yet been completed by the Home Office because of the uncertainties around the new contracts. Data for the current financial year, 2022-23, remains a forecast and subject to change. We did not audit the underlying data.

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