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**Supporting mobile
connectivity**

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Summary

Accessing the internet while on the go is a part of daily life for most people in the UK, and yet the Department for Science, Innovation & Technology (the Department) has more work to do to ensure the UK has the mobile connectivity it needs now and in the future. Launched in 2020, the Shared Rural Network programme aims to increase 4G coverage from 91.4% of the UK landmass to 95% by December 2025. Four years in, coverage is at 93.1%. To meet the 95% target, progress will need to continue at the same rate as the past year, even though the remaining locations will be even harder to reach and connect. This pace may not be sustainable and three of the four mobile network operators have already advised the Department that they are each unlikely to meet interim obligations, set by Ofcom, to increase their own 4G coverage to 88% of the UK landmass by 30 June 2024.

The Government's £501 million investment in the programme is subject to cost pressures, which combined with delivery challenges means installing new masts will cost more than expected. The Department is not yet certain by how much the programme's costs will rise as a result of these pressures, how much of any cost increase will be borne by the taxpayer and whether cost pressures will affect mobile network operators' ability to achieve coverage targets.

Furthermore, the Department has not confirmed which specific areas are in the 5% of the UK that will not have 4G connectivity, and it does not yet have a plan to ensure people in these areas are not left behind. It has not communicated to stakeholders how any gains from increased mobile connectivity translate into better outcomes for consumers and businesses, especially in areas with very low populations.

Public reporting of mobile connectivity across the UK is not fit for purpose. Ofcom's data for measuring connectivity often does not reflect people's experience. People often experience worse coverage than reported because of local geography or building materials used within premises. The Department itself lacks information on whether mobile network operators are on track to meet targets to improve connectivity for road users and premises, and has insufficient data to judge whether connectivity on UK railways is improving.

While the Department has a strategy for supporting 5G, we are unconvinced about what it has achieved to date for its £400 million investment or how it will demonstrate progress. We therefore encourage our successor Committee to keep a close eye on the above issues concerning both 4G and 5G mobile connectivity, and to continue to hold the Department to account for progress on both.

New technologies—such as low orbiting satellites—are emerging very fast. The Government needs to consider these in conjunction with its other policies to ensure investment produces the most favourable results.

Introduction

For most people in the UK, accessing the internet is part of daily life. Mobile connectivity allows people to access the internet and communicate while on the go and in locations where a wired connection does not exist. The Government therefore considers that access to good-quality mobile connectivity is key to growing the economy.

While a competitive market plays a key role in delivering mobile connectivity, the Government may choose to intervene where there is a weaker commercial case for investment, such as in remote areas. One such intervention is the Shared Rural Network programme, in which the Department for Science, Innovation & Technology and Building Digital UK (BDUK), an agency of the Department, are working with the four mobile network operators—EE, Three, Virgin Media O2 and Vodafone—to deliver reliable 4G mobile coverage to 95% of the UK landmass by December 2025. In support of the 95% target, Ofcom licence obligations commit each mobile network operator to increase its 4G coverage to 88% of the UK landmass by 30 June 2024, and to 90% by 31 January 2027.

The Shared Rural Network programme consists of three elements:

- **Partial Not Spots:** This element aims to increase coverage in areas where there were at least one, but not all four, mobile network operators offering 4G coverage so that there is coverage from all four in more areas, at an estimated cost to the operators of £532 million.
- **Extended Area Service:** The Home Office is making available up to 292 masts in remote parts of the UK that it is building as part of its Emergency Services Network programme, and will upgrade these masts so that the mobile network operators can then install the equipment they need to provide commercial 4G coverage.
- **Total Not Spots:** This element aims to provide 4G coverage in the hardest-to-reach areas of Scotland that did not previously have any such coverage. The Government will provide £501 million over 20 years for this element and to develop the Extended Area Service.

The Government also funds other programmes that aim to create favourable conditions for investment in technologies for the UK's future connectivity needs, such as 5G mobile, and has committed over £500 million since 2017 to this. It has set out its plans in its 2023 wireless infrastructure strategy.

Conclusions and recommendations

1. **The Department is not certain what the eventual cost of the Shared Rural Network programme will be, who will bear cost increases and how addressing cost increases will impact on coverage.** Cost pressures and delivery challenges experienced on the programme to date mean that the costs of delivering masts have been higher than expected. On the Extended Area Service element of the programme, the Government's costs have risen by an estimated £44 million due to irrecoverable VAT and inflation. To absorb these additional costs, the Department is considering options for delivering the required increase in 4G coverage but with fewer masts. Cost pressures also mean that the final cost of the Total Not Spot element of the programme is uncertain. BDUK considers that it now has a better understanding of the cost increases on the Total Not Spot element than it did previously, and under the agreement by which the Department provides funding for the Total Not Spot element, it expects that any additional costs should be funded by the mobile network operators. However, Ofcom's licence agreements with the operators allow for relief of their individual obligations if costs are deemed excessive, creating uncertainty about where any costs will fall or if the Government's target for 95% 4G coverage will be met.

Recommendation 1: *The Department and BDUK should work closely with the mobile network operators to ensure that government:*

- *Gets the information it needs from the operators to gain certainty on the cost increases; and*
 - *Uses this information to inform decisions on how cost increases will be managed while at the same time ensuring that coverage targets are met.*
 - *Fully considers emerging new technologies such as low orbiting satellites to ensure investments produce the most cost-effective results.*
2. **The Department has not identified the specific benefits it is aiming to achieve in the most remote areas of the UK to help guide decisions on where investment is most needed to improve connectivity.** To secure good value from the Shared Rural Network programme, the Department needs to know where improved connectivity will offer the greatest benefits for the funding available. However, the Department's business case for the programme included limited evidence of the specific benefits of extending mobile coverage into remote and sparsely populated areas, where building masts may be more difficult or expensive, or where there may be an impact on the environment. Stakeholders from the northwest of Scotland, in areas which are particularly remote, have already raised concerns about the impact on the environment and questioned whether the benefits justify the investment of taxpayers' money. The Department accepts that there is a need for more information on the benefits of improving connectivity in remote areas and says that the individual benefits of each mast will be set out as part of the planning process, which will help to test the benefits of each site.

Recommendation 2: *Now that the proposed locations of Shared Rural Network masts are more certain, the Department should revisit its cost benefit analysis*

to determine more precisely who will benefit, and how, from its investment in 4G connectivity. It should use this information to inform final decisions on mast locations and numbers and to communicate the case for investment to stakeholders.

3. **The Department has not confirmed which specific areas are in the 5% of the UK landmass that will not have 4G connectivity, and it does not yet have a plan for ensuring that consumers and businesses in these areas get the connectivity they need.** At the outset of the programme, the Department committed to increasing 4G coverage to 95% of the UK landmass, but, because the location of masts was not certain, it did not confirm which specific geographical areas would benefit from better coverage. Although the location of masts and the areas that will gain 4G coverage is now clearer, the Department has not set out where the remaining coverage gaps will be or determined how it will ensure that consumers and businesses in these areas get the coverage they need. The 5% of landmass that will not gain coverage from the Shared Rural Network programme is extremely rural and remote, with very low population and only small numbers of people travelling through, and the Department's view is that there is a line to be drawn on how much to invest in those areas where it might not make economic sense to build a mast. The Department acknowledges that it might be more economical to use alternative technologies such as low earth orbit satellites instead of masts to provide coverage in these areas.

Recommendation 3: *With clearer information about the proposed location of masts, the Department should now confirm which areas of the UK will still not have 4G connectivity once the Shared Rural Network programme is complete. It should assess the impact of this on communities in these areas and develop a plan for alternative ways of ensuring they get the connectivity they need.*

4. **The mobile coverage reported by Ofcom does not always reflect the actual level of service that businesses and consumers experience, and which may sometimes be significantly worse than reported.** The data that Ofcom publishes on mobile coverage across the UK is based on modelled estimates provided by the mobile network operators. Ofcom also conducts sample tests to check the data provided by the mobile network operators. However, the mobile coverage levels published by Ofcom do not always reflect the consumer experience. For example, trees, local geography or different building materials used within premises can affect the coverage that people experience. In addition, some people experience worse coverage inside premises and may only receive a 3G signal indoors, despite getting a 4G signal outside. The lack of a 4G signal in some locations may have implications for the connectivity people will experience when mobile network operators begin their planned 3G switch off, which they are due to do from this year and which has already started to happen. The Department has asked Ofcom to determine how it can improve coverage data to better reflect people's experiences, and Ofcom is looking at how it can use crowd-sourced data for this purpose. The Department has said it will explore with Ofcom the setting up of a repository so that consumers can report coverage gaps directly.

Recommendation 4: *The Department should take urgent action to ensure that it has meaningful data on mobile coverage that reflects people's actual experience. As part of this it should:*

- *Work with Ofcom to develop ways that consumers and businesses can directly report coverage gaps in real-time to help build a more realistic and detailed picture of mobile coverage across the UK;*
 - *Ask Ofcom to examine any cases where areas have lost all mobile connectivity following 3G switch off; and*
 - *Ensure that mechanisms for measuring access to 5G coverage are fit for purpose.*
5. **The Department lacks up to date information to track progress on whether the Shared Rural Network programme will meet its targets for increasing connectivity on roads and premises.** In addition to the overall target to increase 4G coverage to 95% of the UK landmass, the Department also aims to provide 280,000 additional premises and 16,000 kilometres of roads with 4G coverage through the Shared Rural Network programme. However, the Department is unclear on how many premises and roads had gained 4G connectivity so far and is still in discussions with the mobile network operators about getting the information it needs to track progress against these targets. Furthermore, it says that Ofcom will not assess whether the mobile network operators have met these targets until 2027. Despite not being able to confirm what progress has been made so far, based on information BDUK has received to date from the mobile network operators, the Department says it is confident that it will meet the roads and premises targets.

Recommendation 5: *The Department should work with Ofcom and the mobile network operators to ensure that it can report publicly on progress against its targets for increasing 4G connectivity on roads and premises.*

6. **Progress in improving connectivity on UK railways has been hampered by a lack of up-to-date coverage data.** Mobile connectivity along major rail routes remains poor and passengers can often struggle to make calls, stream videos or work online. Improving rail connectivity is very challenging, with tunnels, cuttings and safety glass on modern trains making reception difficult. It is also, according to the Department, expensive because it requires installation of infrastructure alongside the railway track. Improving connectivity on railways is the responsibility of the Department for Transport and proposals to improve mobile connectivity need to be judged alongside other priorities for investment on the railways. However, the data on rail mobile coverage that is available to inform these investment decisions is not fit for purpose. There is a lack of granular data showing, for example, mobile coverage for each metre of rail. The data is also out of date, with Ofcom publishing its last study on rail mobile coverage in 2019.

Recommendation 6: *Working with Ofcom and the Department for Transport, the Department should make a plan for more frequent collection of coverage data on the UK rail network to help it prioritise the rail lines where improvements in coverage is most needed. This information should be published on a regular basis so that rail travellers have clearer information on the coverage they will experience.*

7. **The Department's plans for supporting investment in 5G infrastructure are undeveloped and it has not articulated what it has achieved from taxpayers'**

investment to date. Since 2017, the Department has committed over £500 million to determine how 5G technology could be used by consumers and businesses in the UK, to promote investment in 5G, and for research into more advanced technologies. The Department has published information on the outcomes of its spending programmes but has not brought information together to make it clear what it has achieved to date. Nor does the Department currently plan to directly support the roll-out of 5G infrastructure in the same way as it has done for 4G. There have been calls for the Government to act quickly to support 5G deployment in areas where the market is unwilling to deliver, but the Department is waiting to see how willing the mobile network operators are to invest and how far the commercial roll-out progresses before deciding if government investment is needed. It has set an ambition for standalone 5G to be available in all populated areas by 2030, but has not yet defined all populated areas or the level of 5G performance it considers the UK needs.

Recommendation 7: *The Department should set out more clearly what it has achieved from its investment to date in 5G, as well as setting more meaningful and measurable targets for assessing its progress in supporting the roll-out of standalone 5G mobile coverage.*

1 Delivering the Shared Rural Network programme

1. On the basis of a report by the Comptroller and Auditor General, we took evidence from the Department for Science, Innovation & Technology (the Department) and Building Digital UK (BDUK), an agency of the Department, on progress in delivering UK-wide reliable mobile connectivity that meets the country's needs now and in the future.¹ We also received written evidence from the Local Government Association, Digital Mobile Spectrum Limited, Three UK, BT Group, Virgin Media O2, Ericsson and Vodafone UK.²
2. For most people in the UK, accessing the internet is part of daily life. In 2022, UK adults spent an average of four hours a day on the internet. Mobile connectivity allows people to access the internet and communicate while on the go and in locations where a wired connection does not exist. The Government therefore considers that access to good-quality mobile connectivity is key to growing the economy.³
3. While a competitive market plays a key role in delivering mobile connectivity, the Government may choose to intervene where there is a weaker commercial case for investment, such as in remote areas. One such intervention is the Shared Rural Network programme, in which the Department and BDUK are working with the four mobile network operators—EE, Three, Virgin Media O2 and Vodafone—to deliver reliable 4G mobile coverage to 95% of the UK landmass by December 2025. Ofcom, the regulatory and competition authority for the UK's communication industry, awards licences to the mobile network operators for using the UK radio spectrum.⁴ In support of the 95% 4G mobile coverage target, Ofcom licence obligations commit each mobile network operator to increasing their 4G coverage to 88% of the UK landmass by 30 June 2024, and to 90% by 31 January 2027.⁵
4. The Shared Rural Network programme consists of three elements:⁶
 - Partial Not Spots: This element aims to increase coverage in areas where there were at least one, but not all four, mobile network operators offering 4G coverage so that there is coverage from all four in more areas, at an estimated cost to the operators of £532 million.
 - Extended Area Service: The Home Office is making available up to 292 masts in remote parts of the UK that it is building as part of its Emergency Services Network programme, and will upgrade these masts so that the mobile network operators can then install the equipment they need to provide commercial 4G coverage.
 - Total Not Spots: This element aims to provide 4G coverage in the hardest-to-reach areas of Scotland that did not previously have any such coverage.

1 C&AG's Report, [Supporting mobile connectivity](#), Session 2023–24, HC 555, 22 February 2024

2 Local Government Association ([SMC0001](#)); Digital Mobile Spectrum Limited ([SMC0002](#)); Three UK ([SMC0003](#)); BT group ([SMC0004](#)); Virgin Media O2 ([SMC0005](#)); Ericsson ([SMC0006](#)); Vodafone UK ([SMC0007](#))

3 C&AG's Report, paras 1, 1.2

4 C&AG's Report, para 1.8

5 Q 2: C&AG's Report, paras 3, 2.6

6 C&AG's Report, paras 2.4–2.5

5. Digital Mobile Spectrum Limited (DMSL), an organisation wholly owned in equal part by the four mobile network operators, is responsible for overseeing the Extended Area Service and Total Not Spot elements of the Shared Rural Programme. In March 2020, the Department signed a grant agreement with DMSL whereby the Department pays DMSL grants for work done on these two elements and DMSL passes the grant on to the mobile network operators. The Department also funds the work undertaken by the Home Office as part of the Extended Area Service element. In total, the Department is spending £501 million over 20 years to 2039–40 for the Extended Area Service and Total Not Spots elements of the programme.⁷

6. The Department also funds other programmes that aim to create favourable conditions for investment in technologies for the UK’s future connectivity needs, such as 5G mobile, and has committed over £500 million since 2017 to this. It has set out its plans in its 2023 wireless infrastructure strategy.⁸

Delivery against targets and cost expectations

7. Launched in 2020, the Shared Rural Network programme aims to increase 4G coverage from 91.4% of the UK landmass to 95% by December 2025.⁹ According to BDUK’s latest information, coverage currently stood at 93.2% of the UK, 1.8% below the target. BDUK told us that after a slow start by the mobile network operators it wanted to gain some confidence that the operators can achieve the required delivery rate to reach 95% coverage. BDUK noted that the operators had been averaging an increase in coverage of about 0.1 percentage points a month over the past five or six months. The challenge for mobile network operators was to sustain that rate of increase.¹⁰

8. We noted that, in late 2023, three of the four mobile network operators had already advised BDUK that they were each unlikely to meet their Ofcom licence obligation to increase their own 4G coverage to 88% of the UK landmass by June 2024 and wanted to discuss an 18-month extension.¹¹ BDUK confirmed that Ofcom would assess whether an extension should be given in respect of its licence obligation, and would complete its assessment in autumn later this year.¹² However, the Department noted that it was entirely possible for some of these June 2024 obligations not to be met and for the operators still to be in good shape to hit the December 2025 target of 95% coverage. BDUK pointed out that the gap between the June 2024 licence obligation date and the programme’s target date of December 2025 provided a significant contingency which was now being used.¹³ DMSL wrote to us to say that the programme is on track to meet key deadlines, with momentum from industry to deliver.¹⁴

9. Both the Department and BDUK acknowledged that there have been significant cost challenges on the programme.¹⁵ On the Extended Area Service element of the programme,

7 C&AG’s Report, paras 7, 2.5 and 2.6

8 C&AG’s Report, paras 3 and 15; Department for Science, Innovation & Technology [UK Wireless Infrastructure Strategy](#) April 2023

9 C&AG’s Report, para 6

10 Qq 2, 4

11 Q 3; C&AG’s Report, para 3.8

12 Qq 2–3

13 Qq 4

14 Digital Mobile Spectrum Limited ([SMC0002](#))

15 Q 25

the Government's costs have risen by an estimated £44 million due to irrecoverable VAT and inflation, while, on the Total Not Spot element, in late 2023, DMSL indicated that delivery of the planned number of sites and the increase in coverage required from this element was set to exceed the current level of associated government funding.¹⁶

10. To absorb these additional costs, the Department is considering its options. These include delivering the required increase in 4G coverage but with fewer masts.¹⁷ For example, BDUK estimates that only about 170 of the original 292 Extended Area Service masts could be needed to deliver the increase in coverage required of this element, and also understands that the number of masts needed under the Total Not Spots may come down significantly from the current estimate of 260.¹⁸ However, the Department acknowledged that, in respect of extra costs being incurred by the Home Office, Ministers could choose to provide more funding, although currently the Department was looking instead to remain within the current cost envelope by optimising the number and placement of masts to deliver the required coverage.¹⁹

11. BDUK said that the mobile network operators will pick up any additional costs they incur in delivering the programme as they are required to deliver the coverage obligations in their licences from Ofcom. However, the licences also allow the operators relief from these obligations if costs have been excessive. BDUK told us that Ofcom would say that it needed to be reasonable in coming to its judgement about operator compliance with their licence obligations. However, we note that, if Ofcom were to grant such relief, this could put the achievement of the Government's 95% target at risk.²⁰

12. BDUK told us that costs had been one of three areas where it had wanted improved information from the operators. Although it had previously received information from DMSL on costs, the information DMSL had provided had not allowed BDUK to manage the spending profiles for the government-funded elements of the programme. BDUK had now signed an amendment to the funding agreement with DMSL to receive cost information which would allow it to do this.²¹

The benefits of the programme

13. The Department's business case for the programme as a whole identified a range of benefits, such as supporting tourism and business productivity in rural areas. It estimated that the programme would result in quantifiable benefits of £1,352 million. However, the business case included limited evidence of the specific benefits of extending mobile coverage into the more remote or sparsely populated areas, including locations where building masts may be more difficult or expensive, or where there may be an impact on the environment.²² We therefore asked how much of the £1,352 million benefits specifically related to enhanced connectivity in rural areas. The Department was unable to give a

16 C&AG's Report, para 13

17 Q 25

18 Qq 26, 37

19 Q 25

20 Qq 6, 25; C&AG's Report, paras 13, 3.15

21 Q 18; C&AG's Report, para 2.12

22 Q 11; C&AG's Report, para 9

specific figure but said that the overwhelming majority of the benefits were in rural areas, because those tended to be the areas where the market has not been fully incentivised to deliver.²³

14. A number of stakeholders from Scotland, in areas which were particularly remote, have raised concerns about the programme's impact on the environment and questioned whether the benefits justified the investment of taxpayers' money.²⁴ We therefore asked if the Department had done enough in its business case to identify the cost-benefit analysis of putting masts in very rural areas. The Department told us that the business case was high level and could not be disaggregated for individual masts. This was because the programme was a deal between government and mobile network operators whereby the operators would fund the Partial Not Spot element and, in return for this, the Department would fund the Extended Area Service and Total Not Spot elements. It therefore needed to be viewed in the round.²⁵

15. BDUK added that subsequent decisions about where masts should be located is allowing for greater specificity in identifying the programme's benefits. For example, when seeking planning permission, DMSL must submit business plans for each cluster of masts and these should demonstrate what the individual and specific benefits for those locations will be. BDUK therefore expects the planning process to be a really important part of testing the benefits of those sites.²⁶ In addition, over the couple of months to June this year, DMSL is conducting a site-by-site analysis of each proposed Total Not Spot site in terms of the coverage it delivers and its value for money. As part of this, DMSL is also meeting with community interest groups to discuss their concerns.²⁷

The 5% of the UK landmass that will not have 4G connectivity

16. We were concerned about the people in the 5% of the UK landmass that would have no 4G coverage after December 2025, and whether these communities would lose out forever. The Department assured us that the 5% consisted of the most unpopulated areas of the country, such as extremely remote parts of the Highlands of Scotland. These were extremely rural areas where broadly nobody lives and where there were low levels of people travelling through. The Department pointed out that 95% coverage of the UK landmass would still mean that 99% of UK premises would be reached. As a result, only a very small number of people would have no 4G coverage. The Department's business case for the programme had shown that the benefits of building significant amounts of infrastructure in really remote areas for very small numbers of beneficiaries 'fell off a cliff' beyond 95% coverage.²⁸

17. The Department's business case for the Shared Rural Network programme did not confirm which specific geographical areas would benefit from better coverage as a result of the programme and which would not.²⁹ We therefore asked if the Department now knew which specific geographical areas would have lower coverage after the programme ended. The Department replied that it had a broad idea, based on the data in Ofcom's latest

23 Q 38

24 Qq 7, 11, 12

25 Q 11

26 Q 11

27 Qq 12, 18

28 Qq 40, 41

29 C&AG's Report, para 2.13

Connected Nations report and the programme's plans for installing masts. However, it would not know the exact areas until the plans were implemented and there was still some uncertainty over the number of masts that would be delivered under the programme.³⁰

18. We asked the Department about the scope for using alternative technologies, such as low earth orbit satellites in place of masts, to provide mobile coverage in those areas which would still have no 4G coverage after the completion of the Shared Rural Network programme. The Department told us that it was already undertaking trials of the use of such technology in areas where there were serious issues in providing access to broadband services. The trials were going very well and local feedback had been very positive. The Department noted that satellite-enabled mobile telephones were currently expensive both in terms of their upfront costs and the ongoing subscription costs.³¹ However, it expected that over time that satellite technology would probably become the most cost-effective solution for the relatively few premises in the 5% of the UK without 4G coverage.³²

30 Q 40; C&AG's Report, para 13

31 Qq 14–16

32 Qq 59–60

2 Data on mobile coverage

Reported coverage versus people's experience

19. Ofcom is responsible for collecting and publishing data on mobile coverage. Ofcom's coverage data are based on modelled estimates provided by the mobile network operators. Ofcom checks the modelled data by conducting sample tests using antennas attached to some of its vehicles.³³ We showed the Department maps of 4G and 5G coverage across the country which are based on Ofcom's reported coverage; the Department acknowledged that people's experience of mobile coverage may be worse than what is reported by Ofcom.³⁴ The Local Government Association also wrote to us with its concerns about the disconnect between the level of reported coverage and the real-life experience of residents, especially in rural areas.³⁵ The Department said that local factors, such as trees, geography and the type of building materials used within premises, can mean people experience worse coverage than Ofcom reports.³⁶

20. For the Shared Rural Network programme, the Department reports progress on improving outdoor coverage and not indoor coverage. The Department confirmed that it collects data on indoor coverage. Understanding whether people can get a mobile signal indoors is important because, for example, people in rural constituencies may use 4G as an alternative to having a fixed broadband connection at home.³⁷ Furthermore, mobile network operators have started switching off their 3G signals. This may mean that people who can get 4G outside their home but can currently only get a 3G signal inside may be left without mobile data indoors when their operator switches off 3G. The Department explained that Ofcom has agreed clear expectations with the mobile network operators that, as they switch-off their 3G services, they need to provide a similar 4G service.³⁸

21. The Department told us that local gaps in 4G coverage may not be due to the lack of a mast, but due to the nature of the equipment on that mast; for example, the antennas may not be angled correctly or the equipment may not be strong enough to provide full coverage. However, the Department acknowledged that the coverage data it currently has does not enable it to understand these very local gaps in coverage or to identify the infrastructure adjustments needed to address them.³⁹

22. As part of the wireless infrastructure strategy, the Department asked Ofcom to improve its understanding of local coverage gaps. In 2023, Ofcom started using crowdsourced data to better measure the speed of connection that people experience at a local level. The Department explained that it would like similarly detailed data for areas with no mobile coverage, but that the crowdsourced data cannot yet provide this. Nonetheless, the Department told us that it expects big improvements in the level of detail of the coverage data that Ofcom will be publishing later in 2024.⁴⁰ Such improvements should benefit consumers as better information about gaps in coverage should incentivise mobile

33 Qq 24, 44; C&AG's Report, paras 1.8, 3.21

34 Qq 16, 24

35 Local Government Association ([SMC0001](#))

36 Q 24

37 Qq 23–24, 27

38 Qq 41–42; C&AG's Report, para 5

39 Qq 42, 46

40 Qq 24, 44

network operators to improve their coverage. We asked the Department whether there was any way for members of the public to feed in when and where they are not getting a good signal. The Department responded that, while no such site currently exists, it would speak to Ofcom about developing a central repository for people to report coverage gaps.⁴¹

Measuring improvements to road and premises coverage

23. As part of its Shared Rural Network programme, the Department aims to extend 4G coverage to 280,000 additional premises and an additional 16,000 kilometres of UK roads by December 2025.⁴² Many of the expected benefits of the programme come from increased premises coverage.⁴³ To ensure that mobile network operators deliver these increases, Ofcom included premises and roads targets in the operators' spectrum licences. However, Ofcom will not assess whether mobile network operators have met these targets until the end of the licence period in 2027.⁴⁴

24. We asked the Department how it will know whether it has achieved its premises and roads targets and whether there was a risk of getting to the end of 2025 without being able to assess progress.⁴⁵ The Department told us that it would like better visibility of its progress against these targets, including more detailed coverage forecasts, and it is speaking with the mobile network operators about getting the necessary information.⁴⁶ It described the challenge of trying to get the mobile network operators to share commercially sensitive data about their network's coverage. The Department said it would like the mobile network operators to share the data with it privately.⁴⁷

25. The Department told us that it does have some numbers on the increased coverage of roads and premises, but that they are unverified and it is not confident in them.⁴⁸ The Department estimates that, since the start of the programme, coverage on roads has improved by about 11 percentage points. However, the Department told us it is not clear to what extent this increase in road coverage is due to the programme.⁴⁹

26. The Department recognised that it needs to do more work to understand its impact on road coverage, and told us it is working with Ofcom and with the mobile network operators to improve the information available.⁵⁰ Nevertheless, the Department told us that it is confident that, come December 2025, it will be able to assess whether it has met its premises and roads targets,⁵¹ and that, based on the data it has received from the mobile network operators to date, it expects to meet the target.⁵²

41 Qq 43, 51

42 Q 49; C&AG's Report, para 2.3

43 Q 11

44 Q 27; C&AG's Report, para 2.6

45 Qq 49–50

46 Qq 27, 49–50

47 Qq 27, 28

48 Q 28

49 Q 19

50 Q 19

51 Qq 49–50

52 Q 28

Mobile coverage on railways

27. Connectivity along major rail routes remains poor. Passengers can struggle to make calls, stream videos or work online. The Department told us that improving connectivity on railways is challenging. It explained that it is hard for the signal to penetrate through tunnels, deep cuttings and safety glass on modern trains. According to the Department, improving coverage on trains would be expensive and require complex infrastructure along the side of the track, which, it described, as more difficult than improving coverage on roads. The Department further explained that there is a weak commercial case for individual mobile network operators to invest in railway coverage, due to the high costs for infrastructure and marginal commercial benefits.⁵³

28. The Department told us that it lacks sufficiently detailed data of coverage across the railways. To understand the coverage challenges along different stretches of track, it needs data for each metre. In 2020, the National Infrastructure Commission recommended that Ofcom should report on mobile coverage on the railways at least every two years. Ofcom's last study on rail coverage was in 2019. The Department said that it had asked Ofcom to improve reporting of coverage on the railways, including improving how Ofcom measures coverage.⁵⁴

29. The Department told us that Network Rail, and in turn therefore the Department for Transport and its accounting officer, are responsible for the business case for improving connectivity on the railways. Owing to the infrastructure required, the case for improving connectivity has to be judged alongside other priorities for investment on the railways. Project Reach, Network Rail's programme to improve connectivity on the railways has been delayed, with some key rail lines missing out. The Department acknowledged that, as it and the Department for Transport learn more about the gaps in coverage and the case for intervention, they will want to do more to improve connectivity on the railways.⁵⁵

53 Qq 19, 21; C&AG's Report, para 4.14

54 Qq 19, 22; C&AG's Report, para 4.14

55 Qq 19–22

3 Plans for 5G and future connectivity

Establishing the case for 5G

30. Government's plans for investing in future mobile connectivity are set out in its 2023 wireless infrastructure strategy. 5G is the latest generation of wireless technology. Non-standalone 5G, which makes use of existing 4G infrastructure, can be faster than 4G, while standalone 5G technology, which uses 5G infrastructure throughout, enables even higher speeds and the ability to connect thousands of devices in a small area.⁵⁶ The Department outlined potential uses for standalone 5G technology, such as in advanced manufacturing, the operation of ports, healthcare and enhancing sporting, cultural and music events.⁵⁷ It claimed that widespread UK adoption of standalone 5G could bring cumulative productivity benefits of between £41 billion and £159 billion between 2021 and 2035.⁵⁸

31. Since 2017, the Department has spent £400 million in developing possible uses for 5G because it is not yet obvious that consumers will need 5G and the commercial case is not yet clear enough to support industry's investment.⁵⁹ The Department's strategy set out its plans to provide a further £36 million for UK regions to promote growth through investment in 5G, and up to £100 million for research into more advanced technologies such as 6G.⁶⁰ The Department told us that its research programmes and testbeds have aimed to understand the potential applications that may only be possible using 5G technology and how to grow them to scale. However, the Department acknowledged that, although it has published information on what it has funded and achieved, there is more it can do to draw together the findings of its research.⁶¹

32. While we could see the logic of demonstrating the benefits of 5G, the sums involved have been large, and we were concerned that commercial operators could have worked out themselves what benefits they could get from standalone 5G without government intervention.⁶² We asked the Department when it expected to see a dividend from its investment. The Department said that it was about to hit the tipping point at which commercial operators will pick up on the Government's research and start spending their own money.⁶³

Deployment of 5G infrastructure

33. The mobile service company Ericsson wrote to us about the UK National Infrastructure Commission (NIC) Second National Infrastructure Assessment which stated that the government should prepare to act fast to support 5G deployment in areas where the market is unwilling to deliver.⁶⁴ The Department told us it is reluctant to spend public money on building infrastructure that the private sector would build for itself "within

56 C&AG's Report, paras 15, 4.3, footnote 8

57 Qq 53–54, 57

58 Q 62; C&AG's Report, para 15

59 Qq 17, 52, 55; C&AG's Report, para 4.4

60 C&AG's Report, para 15

61 Qq 52–53, 61

62 Q 56

63 Q 58

64 Ericsson ([SMC0006](#))

a reasonable timeframe”. It told us that its policy is that the roll-out of infrastructure should be commercially-led and that it currently has no plans to directly support 5G roll-out in the same way as it did for 4G. It was waiting to see how willing the mobile network operators are to invest and how far the commercial roll-out gets before deciding if government investment is needed.⁶⁵

34. The Department has stated that it wants to see standalone 5G in all populated areas by 2030.⁶⁶ Although non-standalone 5G is more widely available, the Department thinks it unlikely to meet the UK’s future connectivity needs. The Department has yet to define what it means by populated areas or to set out the level of performance needed.⁶⁷ We asked the Department about what this target would look like in practice, in terms of landmass coverage, and how close it was to meeting it. The Department responded that the vision for 5G in 2030 is not a target but an ambition as, without providing funding, it has no control over the level of 5G coverage achieved.⁶⁸

65 Qq 17, 52, 61

66 C&AG’s Report, para 15

67 Q 61; C&AG’s Report, paras 4.6, 4.7

68 Q 63

Formal minutes

Thursday 23 May 2024

Members present

Sir Geoffrey Clifton-Brown, in the Chair

Mr Jonathan Djanogly

Richard Fuller

Peter Grant

Sarah Olney

Matt Warman

Declaration of interests

The following declarations of interest relating to the inquiry were made:

22 April 2024

Matt Warman declared the following interest: he was a Minister in the former Department for Digital, Culture, Media and Sport between 2019 and 2021, and in 2022, which included responsibility for mobile connectivity programmes.

Supporting mobile connectivity

Draft Report (*Supporting mobile connectivity*), proposed by the Chair, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 34 read and agreed to.

Summary agreed to.

Introduction agreed to.

Conclusions and recommendations agreed to.

Resolved, That the Report be the Thirty-fifth Report of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, That embargoed copies of the Report be made available (Standing Order No. 134).

Adjournment

The Committee adjourned.

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

Monday 22 April 2024

Sarah Munby, Permanent Secretary, Department for Science, Innovation and Technology; **Emran Mian CB OBE**, Director General for Digital, Technology and Telecoms, Department for Science, Innovation and Technology; **Dean Creamer CBE**, Chief Executive, Building Digital UK

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Published written evidence

The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website.

SMC numbers are generated by the evidence processing system and so may not be complete.

- 1 BT Group ([SMC0004](#))
- 2 Digital Mobile Spectrum Limited ([SMC0002](#))
- 3 Ericsson ([SMC0006](#))
- 4 Local Government Association ([SMC0001](#))
- 5 Three UK ([SMC0003](#))
- 6 Virgin Media O2 ([SMC0005](#))
- 7 Vodafone UK ([SMC0007](#))

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the [publications page](#) of the Committee's website.

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