



House of Commons
Scottish Affairs Committee

Digital Connectivity in Scotland

Fifth Report of Session 2017–19

*Report, together with formal minutes relating
to the report*

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The Scottish Affairs Committee

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Committee reports are published on the [Committee's website](#) and in print by Order of the House.

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Committee staff

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1 Introduction

1. Digital connectivity has transformed the way people work, learn and communicate, and is an essential part of modern life. In 2017, 90% of households in Great Britain had internet access compared to 57% in 2006, and 73% of adults accessed the internet using a mobile, more than double the 2011 rate of 36%.¹ Digital connectivity is also a driver of economic growth—the availability and take-up of faster broadband speeds is predicted to add £17 billion to the UK’s economic output by 2024.²

2. Scotland has seen improved broadband and mobile coverage over the past few years. Ofcom’s latest data shows that the area covered by 4G mobile services from all operators in Scotland increased by 76% between June 2017 to January 2018. The latest Ofcom figures for January 2018 showed that superfast broadband coverage (24Mbps)³ was at 91% in Scotland, compared to 87% in May 2017.⁴ However, despite improvements in recent years, Scottish mobile and broadband coverage is still behind the rest of UK with Scotland’s large rural landmass posing significant challenges: in 2017, 94% of urban Scotland had access to superfast broadband, compared to 56% of rural areas.⁵

3. Both the UK and Scottish Governments are committed to improving digital connectivity in Scotland. Telecommunications policy is reserved to Westminster; however, the Scottish Government has been responsible for designing and implementing the rollout of UK Government programmes in Scotland. The Scottish Government has developed its own policies to deliver broadband coverage as well as contributing funding to the UK Government programmes in Scotland.

Our inquiry

4. During our “My Scottish Affairs” inquiry at the start of this Parliament, we asked members of the public to suggest topics for us to investigate.⁶ Digital connectivity was one of the areas that received the largest number of suggestions and we launched this inquiry in response to that feedback.⁷

5. We held six evidence sessions with 38 witnesses—including academics, coverage experts, community and business representative bodies, local authorities, broadband and mobile providers, and representatives from the UK and Scottish Governments. We had the highest level of written submissions for any of our inquiries in this Parliament, receiving over 120 contributions from people across Scotland—90 of which were from individuals and community groups. We are grateful to all those who have contributed. The graph below summarises the main issues raised in the individual submissions, several of which we consider in more detail in this Report.

1 Office for Nation Statistics, [Internet access - households and individuals: 2017](#), August 2017

2 SQW Group for DCMS, [UK Broadband Impact Study: Impact Report](#), November 2013

3 Broadband speed is measured in Mbps - megabits per second. The higher the number of megabits you are able to download per second, the faster the connection. Download speed is the most common measurement: it is the speed with which you can receive data over the internet.

4 Ofcom, [Connected Nations update – Spring 2018](#), April 2018

5 Ofcom, [Connected Nations](#), 2017

6 Scottish Affairs Committee, [My Scottish Affairs inquiry](#), 7 June 2018

7 Full terms of reference can be found on the inquiry [website](#).

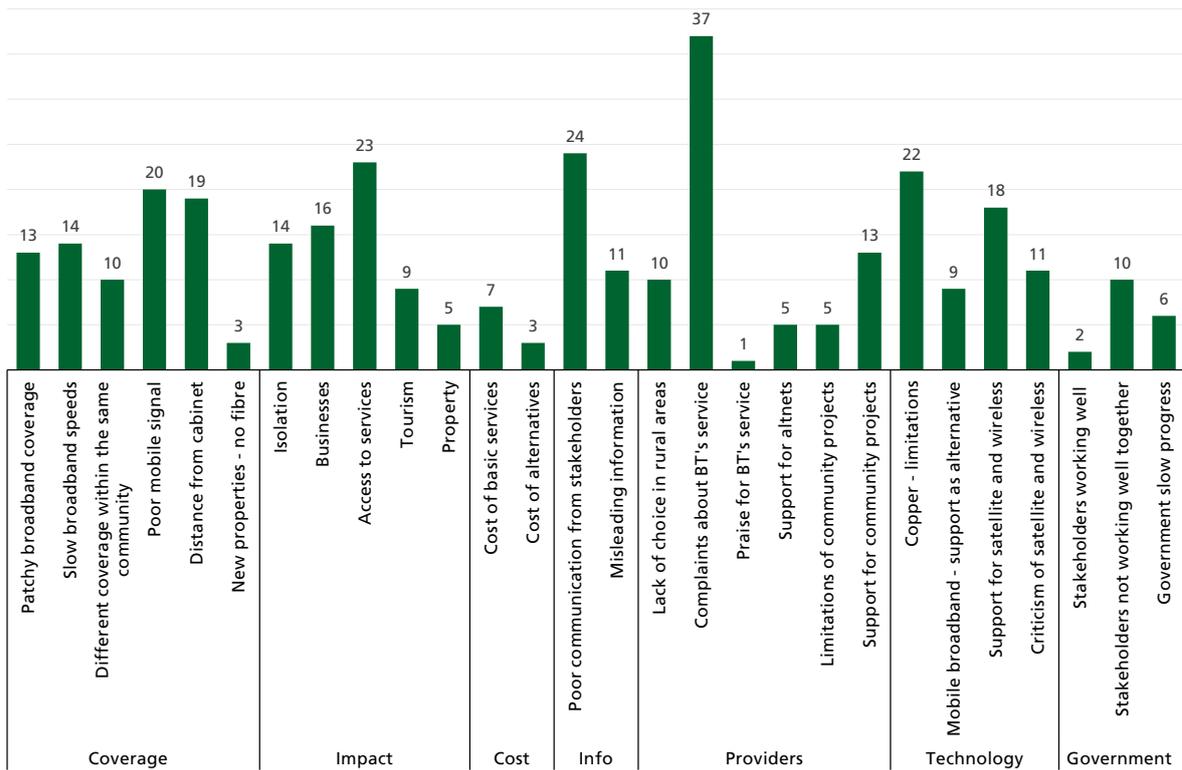


Figure 1: Analysis of written evidence

In this Report we consider:

- a) Broadband coverage issues and their impact on consumers in Chapter Two;
- b) The relationship between the UK Government and Scottish Government in Chapter Three;
- c) The options for delivering broadband to remote areas in Chapter Four;
- d) The transition to full-fibre technology in Chapter Five;
- e) Mobile phone coverage in Chapter Six, and
- f) The challenges of delivering telecoms infrastructure for providers in Chapter Seven.

2 Broadband coverage and availability

6. Broadband coverage is a modern utility: according to Which? nine in ten people regard it is an essential alongside water, gas and electricity.⁸ However, over half of the people Which? surveyed said that they had had a problem with their broadband provider in the last year.⁹ During the course of this inquiry we heard from several individuals and community groups about the poor quality of coverage in their area and the impact this has on them and their communities, particularly as more public services are becoming digital by default.¹⁰ For example, Southdean Community Council said:

Smart meters, mobile banking, downloading forms from the internet, emails, online planning applications, care of the elderly via digital services, are amongst examples of tasks that are easier elsewhere (some are impossible), and the lack of ability to properly participate in the digital age is leaving us increasingly disadvantaged.¹¹

Current coverage in Scotland

7. According to Ofcom's most recent data, 91% premises in Scotland have access to superfast broadband¹² and ThinkBroadband's latest figures show that coverage is now at 93.4% compared to 95% in England,¹³ a gap of 1.6%.¹⁴ Coverage has improved over the last few years, increasing by 18 percentage points since June 2015 (see Table 1).

Table 1: Superfast broadband coverage (30Mbps) in Scotland¹⁵

| | | June 2015 | June 2016 | May 2017 | January 2018 |
|--|----------|-----------|-----------|----------|--------------|
| Access to download speed of 30Mbps or higher (superfast) | Scotland | 73% | 83% | 87% | 91% |
| | England | 84% | 90% | 93% | 94% |

Source: Ofcom Connected Nations: Spring Update 2018

These improvements have been delivered through a combination of commercial rollout and rollout that has been subsidised by Government funding.

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- 8 [Q1](#)
- 9 [Q1](#), Which?, [More than half of households experience problems with broadband](#), 2017 - this was a survey of 1,700 people
- 10 UK Government, [Digital Strategy](#), November 2012
- 11 Southdean Community Council ([DCS0005](#))
- 12 Ofcom calculates this by combining coverage data - the download speed available at every residential and small business property in the UK - with data from providers, which describes the actual broadband speeds for every active line in the country. This gives Ofcom a view of services that *can* be delivered to every home and SME, and of the speeds that are actually being received. (Ofcom, Connected Nations 2017)
- 13 Thinkbroadband, [Local Broadband Information: UK Superfast and Fibre Coverage](#), accessed 13th July 2018
- 14 Ofcom and ThinkBroadband's coverage figures differ mainly because of the timing of publication. ThinkBroadband update on a daily or weekly basis as needed, whereas Ofcom do quarterly data releases. They also use slightly different methodology - ThinkBroadband update their model as network roll-outs happen; Ofcom use data provided by broadband providers.
- 15 These speeds are based on the *measured speed* for the access line, which is the speed of the broadband connection to a premise, as recorded by the operator.

8. There is a significant difference between coverage in rural and urban areas. Rural areas tend to have poorer coverage and slower speeds as a combination of higher installation costs and a smaller market of potential customers means there is less of an incentive for providers to invest.¹⁶ Ofcom's latest figures in Table 2 show that the gap between rural and urban areas in Scotland is 38%, although the situation has improved over the past few years.

Table 2: Coverage of superfast broadband (30Mbps) by urban and rural premises in Scotland

| | 2015 | 2016 | 2017 |
|-------|------|------|------|
| Urban | 82% | 90% | 94% |
| Rural | 31% | 46% | 56% |
| Gap | 51% | 44% | 38% |

Source: Ofcom Connected Nations: Scotland 2017

The Scottish Government pointed out that parts of rural Scotland are amongst the most difficult areas in Europe to deploy telecoms infrastructure.¹⁷

9. Academics specialising in rural broadband told us that broadband availability and community resilience were intrinsically connected. Rural economies are built on businesses, tourism and the property market—these all depend on connectivity because it can hugely influence a person's decision to set up in, visit, relocate to or remain in an area.¹⁸ Professor Sarah Skerratt, Scotland's Rural College, said:

There is a connection [...] between broadband and housing and recruiting labour into that business sector. [...] broadband does not sit alone as a piece of infrastructure. It enables and disables progression within the economy.¹⁹

10. **Digital connectivity is an essential utility—everyone should have affordable access to a high-quality connection. Scotland's broadband coverage has improved significantly in recent years, increasing by 20% since 2015 despite its low population density and significant geographical challenges. However, more progress needs to be made, with over 6% of Scottish premises still unable to access superfast broadband, according to the latest figures from ThinkBroadband. In a society that increasingly operates on a “digital-first” basis, we are concerned that a proportion of people in Scotland do not have access to a good quality and reliable broadband service, particularly in rural areas.**

Communicating broadband coverage

11. One of the most frequent issues that the public raised with us during this inquiry was the gap between the broadband service they received and the coverage they had been told was available in their area. Whilst technical factors such as distance from the premises to the cabinet and the quality of the consumer's technology mean it is inevitable that

16 Scottish Government, [Rural Scotland Key Facts 2015](#), 15 May 2018

17 Scottish Government ([DCS0081](#))

18 [Q88](#) [Dr Philip], [Q92](#) [Dr Bosworth]

19 [Q92](#)

customers with the same provider will experience different broadband speeds,²⁰ Which? highlighted that information was not as clear to consumers as it could be:

There is a lot more that both Governments and Ofcom could be doing to make sure that consumers have all that information so that they can make the right decision, whether around choosing a package or, when they have a package, where they are not getting the experience that they should be getting.²¹

There are many sources of information about broadband coverage and the different terms that are used to describe broadband speeds. Ofcom produces regular research on broadband coverage²² and runs applications which enable customers to check their speed at postcode-level. Local speed checker platforms are offered by independent organisations like Which? and ThinkBroadband, who also collate their own weekly coverage data for a consumer audience.²³ Government rollout programmes and commercial providers give availability information by postcode on their websites and companies also use advertisements to promote broadband availability.

12. There are a number of different ways to describe broadband speeds:

- a) **Headline speed:** this is usually used in adverts for broadband services and means that the speed is available to at least 50% of customers at peak time.²⁴ The available speed is a median speed available at peak time and must be described as the “average”. This definition changed recently: before Ofcom and the Advertising Standards Authority (ASA) introduced new regulations in November 2017, the advertised headline speeds referred to the maximum speed available to at least 10% of customers, and were preceded by the words “up to” instead of “average”.²⁵
- b) **Point of sale speed:** the estimated speed that a customer is quoted before they purchase the broadband service for the first time. It is an estimate of the maximum speed a customer will be able to experience on their individual line and is often lower than the headline speed.
- c) **Measured line/sync speed:** the maximum rate at which the line connecting a customer’s property to the street cabinet or exchange can operate. It is normally lower than the point of sale speed because of local technical factors such as line interference.
- d) **Consumer experience speed:** the measured speed that the consumers actually experience. It is normally lower than the sync speed because of the quality of wiring in the user’s home, the number of devices they connect, a reduction in speed from using WiFi to connect a device to the household’s hub, and the number of other people connecting to the internet, particularly at peak times.

20 ASA, [Broadband speed claims: Advertising guidance \(non-broadcast and broadcast\)](#), November 2017

21 Q3 [Pete Moorey]

22 They publish an annual [Home Broadband Performance report](#) and [Connected Nations coverage report](#) - this now has biannual updates.

23 See ThinkBroadband “[Local Broadband Information](#)”

24 Ofcom ([DCS0119](#))

25 ASA, [Major change to broadband speed claims in ads](#), 23 November 2017

As the graph below shows, speeds normally diminish between these measurements.

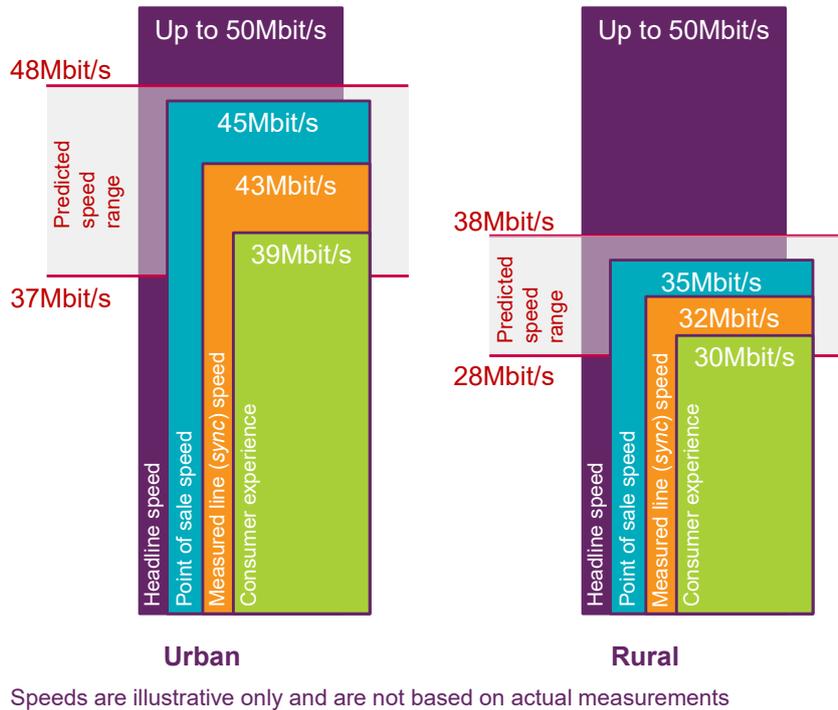


Figure 2: Ofcom, [Connected Nations 2016](#)

In addition to different descriptions of speed, the UK and Scottish Government use different definitions of superfast broadband (the UK Government defines it as 24Mbps whereas Ofcom and the Scottish Government define it as 30Mbps), and some broadband programmes and providers describe only the technology being used to deliver the service, for example “fibre-enabled broadband”,²⁶ which may imply a certain level of coverage without guaranteeing it.

13. The issue of communities being told they had access to “fibre-enabled”, whilst still receiving low speed, was mentioned by several groups that contacted us during the inquiry.²⁷ Grace Ormiston, a local resident of Eccles, reported that their village still does not have access to superfast speeds, despite BT phoning the community and telling them they were entitled to superfast broadband.²⁸ This is because, whilst their nearest cabinet is “enabled for fibre” which delivers a fast speed to the cabinet, their community is “too far from the cabinet to get increased connection speed”²⁹ due to the fact that the remaining connection to residences uses copper wire (see Figure 3 below) which causes speed to drop quickly, particularly over longer distances.

26 Grace Ormiston ([DCS0022](#))

27 Aberdeenshire Council ([DCS0095](#)), Killearn Community Council (KCC) & Killearn Broadband Group (KBG) ([DCS0057](#)), Borgue Community Council ([DCS0029](#))

28 [Q200](#)

29 Grace Ormiston ([DCS0022](#))

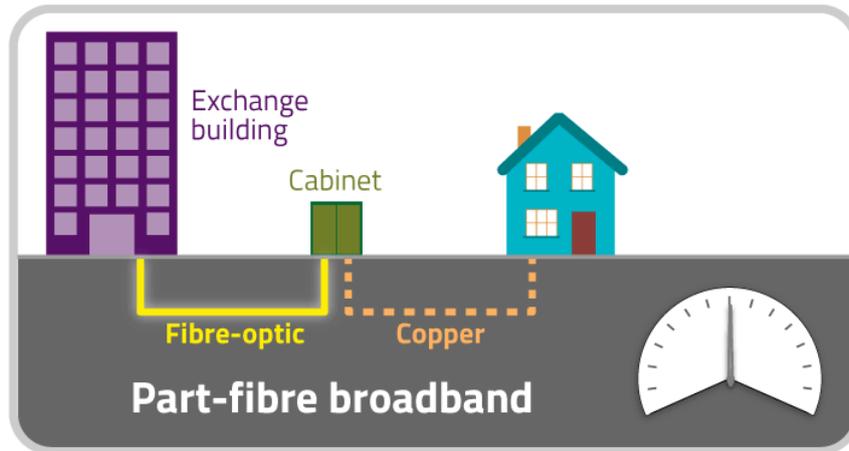


Figure 3: Ofcom, [Building a full-fibre future](#)

14. The ASA recently reviewed how the term “fibre broadband” can be used in adverts. At present it can be used even if only part of the connection uses fibre cable, so it can refer to service where the final connection to the premises uses a slower, copper line.³⁰ The ASA considered whether the entire connection should use fibre cable for an advert to use the term “fibre broadband” but decided against this position arguing that customers “do not notice “fibre” claims in ads”.³¹

15. CityFibre explained that there is poor consumer awareness of what full-fibre is and how it differs from part-copper, part-fibre products that some providers such as BT use to deliver superfast broadband. They blame “lax advertising rules” and have criticised the ASA’s decision on how “fibre” is used in broadband advertising.³² CityFibre have been granted permission by the High Court to proceed with a Judicial Review of the ASA’s decision which is expected to be heard this summer (2018).³³

16. When we discussed the ASA’s decision with Ofcom they suggested the issue might need revisiting, arguing that as full-fibre connections became more common it would become more important to distinguish between this and those that are only partially-based on fibre.³⁴ They said terms like “fibre” are used most widely in marketing terms, but it is often unclear what precise speeds are available through this technology.³⁵ The UK Government’s 2017 Digital Strategy committed to ensuring that the term “fibre” should only be used to describe full-fibre services.³⁶

17. We were struck by the complexity that some consumers face in determining what broadband speed they should expect and recognise the frustration caused when this is not delivered. We welcome Ofcom’s work to refine how broadband speeds are measured, but believe that it does not go far enough. The consumer’s experience of broadband speed should always be the priority: we believe that all stakeholders have a responsibility to reflect accurately the actual available speed in all communications so that consumers fully understand what speeds they can get.

30 Ofcom, [UK fixed-line broadband performance](#), November 2016

31 ASA, [ASA concludes review of “fibre” broadband](#), November 2017

32 [Q121](#)

33 CityFibre, [CityFibre challenge Advertising Standards Authority over “Fake Fibre” Ruling](#), accessed July 2018

34 [Q405](#)

35 [Q408](#)

36 UK Government, [UK Digital Strategy](#), March 2017

18. The language used to describe broadband services can be confusing for the consumer. We welcome the steps both Ofcom and the Advertising Standards Authority have taken to improve accuracy in communicating broadband speeds to customers. However, we believe it is misleading to use the phrase “fibre broadband” to describe connections that rely on copper technology which deliver much slower speeds. We recommend that the ASA revisit their November 2017 ruling that “last mile copper solutions can be referred to as “fibre broadband.”” As more companies offer full-fibre services it is important that customers know exactly what they are paying for.

Enforcing speeds

19. We explored with Internet Service Providers (ISPs) what recourse customers had when they did not receive the speeds that had been promised when they signed up for a service. In response, Brendan Dick, BT Scotland, emphasised that the customer should be told what speed they should expect at the point of sale.³⁷ He also highlighted that Openreach engineers are often sent to resolve technical issues on a premise-by-premise basis.³⁸

20. Ofcom’s existing codes of practice on broadband speeds require signatories to provide customers with a Minimum Guaranteed Access Line Speed (MGALS) at the point of sale (on request) and give customers the right to exit their contracts if their speed falls below a minimum level.³⁹ In March 2019 these requirements will change to require ISPs to provide better estimates to consumers. They will have to reflect the slower speeds people can experience at “peak” times and providers must show the MGALS figures before sale (instead of on request). The changes will also strengthen the consumer’s right to exit: providers will have one month to improve speeds if they fall below the MGALS level before they must let customers walk away penalty-free.⁴⁰

21. Whilst the ability to leave a contract without penalty is welcome, it is of limited use when there is no other broadband provider that a consumer can switch to. This is often the case for people living in rural communities where there is no commercial incentive for multiple providers to offer a service. We heard from a number of people who had felt they had no choice but to stay with their current provider.⁴¹ When we discussed the issues with Ofcom they admitted there were some shortcomings in the current right to exit scheme:

I would say that there is a fundamental issue here, which is that the right to exit, of course, does not do you a great deal of good if you want a service and you only have one provider.⁴²

They said that improving the quality of information was crucial, and that the shift to fibre will make the service people receive more reliable.⁴³

37 [Q200](#)

38 [Q198](#)

39 Ofcom, [Better Broadband Speeds Information: Voluntary Codes of Practice](#), March 2018,

40 ISPreview, [Ofcom Enhances UK Code of Practice for Broadband ISP Speeds](#), October 2017

41 Mr Stuart Smith ([DCS0004](#))

42 [Q396](#)

43 [Q396](#)

22. At the end of 2017, Ofcom accepted an industry scheme, proposed by the main ISPs, which allows consumers to claim automatic compensation for: delayed repair following loss of service, missed appointments, and delays with the start of a new service. However, this does not include compensation when speeds are consistently and substantially below those customers were promised while signing up to a service.⁴⁴

23. **We welcome the current “right to exit” policy which lets consumers leave contracts without penalty if the service they received is below what they were told they could expect when signing up to a service. However, this right only offers meaningful recourse if there is another provider customers can move to—which simply isn’t the case for many people in more rural areas. *We recommend that Ofcom consult on introducing a right to automatic compensation for consumers in areas that are serviced by only one provider and whose broadband speeds fall below the minimum guaranteed level.***

44 Ofcom, [Automatic Compensation - Protecting consumers from service quality problems](#), 2017

3 How broadband is delivered in Scotland

24. Government-supported rollout of broadband in Scotland is delivered by the Scottish Government’s Digital Scotland Superfast Broadband programme. Telecommunications policy, including wireless, telegraphy and internet services, are reserved matters,⁴⁵ and the UK Government sets broadband and wider telecommunications policy. Broadband Delivery UK (BDUK), part of the Department for Digital, Culture, Media and Sport, is responsible for managing the Government’s funding for broadband delivery across the UK. The BDUK Superfast Broadband Programme is divided into three phases:

- Phase 1: Provide superfast broadband coverage (24Mbps) to 90% of UK premises by early 2016. Phase 1 was completed in Spring 2016.⁴⁶
- Phase 2: Provide superfast broadband coverage to 95% of UK premises by the end of 2017. This was completed in December 2017.⁴⁷ The current figure for superfast coverage in the UK is 95.3%.⁴⁸
- Phase 3: Explore options to provide superfast coverage to the hardest to reach parts of the UK—“the final 5%”.⁴⁹

The UK Government gave the Scottish Government responsibility for designing and implementing the superfast rollout programme in Scotland, to which the Scottish Government has also contributed its own investment.⁵⁰ The Scottish Government provided this funding even though they were under no obligation to provide funding in an area that is clearly reserved.

Digital Scotland Superfast Broadband

25. The Scottish Government is currently delivering broadband through the Digital Scotland Superfast Broadband (DSSB) programme. DSSB is made up of a Highlands and Islands programme and a rest of Scotland programme and is the vehicle through which Phases 1 and 2 of the UK Government’s broadband policy was delivered. Both Governments contributed to the funding of DSSB with the Scottish Government providing £62.8m and the UK Government contributing £100.8m; the full breakdown of funding, provided by Audit Scotland, is shown below.⁵¹ The Scottish Government said that it is “committing unprecedented sums to extend broadband and mobile coverage in Scotland”.⁵²

45 Ofcom, [Connected Nations report](#), 2017

46 ISPreview article, [Q2 2017 “Fibre Broadband” Take-up Progress for the £1.6bn BDUK Project](#)

47 ISPreview article, [Q3 2017 Take-up Progress of the BDUK Superfast Broadband Rollout](#), 8 February 2018

48 Thinkbroadband.com, [“UK Superfast and Fibre Coverage”](#), accessed 13 July 2018

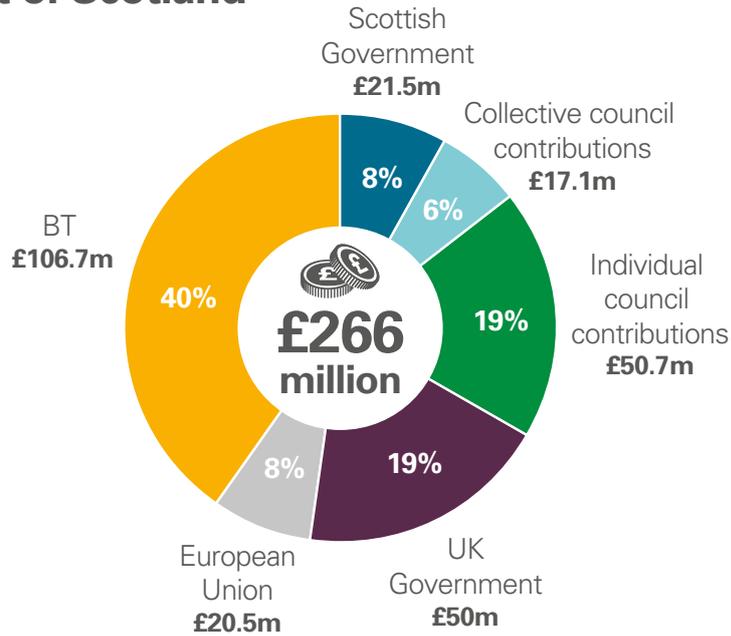
49 House of Commons Library briefing, [Superfast Broadband coverage in the UK](#), 2017

50 House of Commons Library, [Superfast Broadband Coverage in the UK](#), March 2017

51 Audit Scotland Progress Report, [Superfast broadband for Scotland](#), 2015

52 Scottish Government ([DCS0081](#))

Rest of Scotland



Highlands and islands

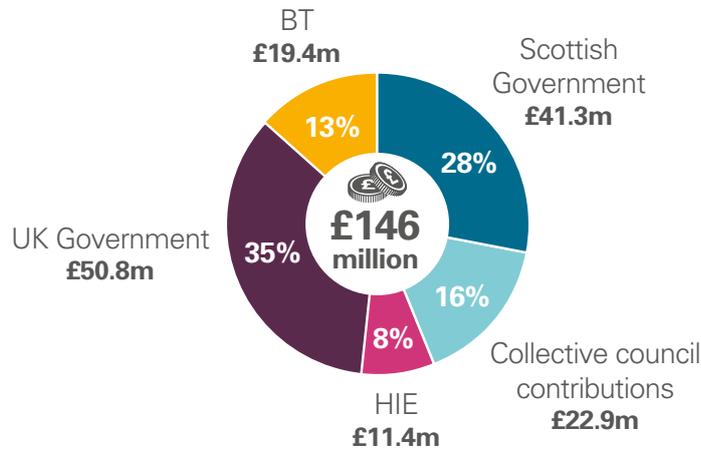


Figure 4: Audit Scotland, [Superfast broadband for Scotland](#)⁵³

DSSB aimed to provide 95% of Scottish premises with fibre broadband,⁵⁴ initially by the end of 2017,⁵⁵ this target was moved to March 2018.⁵⁶ In January 2018, the Scottish Government announced that it had delivered fibre broadband to 95% of premises.⁵⁷

53 HIE refers to Highlands and Islands Enterprise
 54 Fibre broadband refers to the technology used to deliver broadband (having fibre cable running to the cabinet) and is not a measure of speed. Superfast broadband in Scotland (30Mbps) currently stands at 93.4%.
 55 Scottish Government, [Broadband coverage extended](#), 22 October 2017
 56 Digital Scotland, [The Partnership - Digital Scotland Superfast Broadband](#), accessed 18 July 2018, ISPreview.co.uk, [UK and Scottish Governments Row Over Superfast Broadband Again](#), 20 January 2018, ISPreview.co.uk, [Scotland Commit £600m for 100% Coverage of 30Mbps Broadband](#), 14 December 2017
 57 Scottish Government, [95% broadband coverage](#), 17 April 2018, The Scotsman, [Keith Brown: Superfast broadband for all Scots is coming](#), 22 January 2018,

Progress on broadband delivery

26. In addition to the £100.8 million described above, the UK Government allocated a further £20.99 million in February 2014 to support further rollout by Digital Scotland.⁵⁸ The way that this funding was used has been the subject of intense debate between the UK and Scottish Governments, which we explored with Fergus Ewing MSP, Cabinet Secretary for the Rural Economy and Connectivity, and Matt Hancock MP, then Secretary of State for DCMS.

27. The Secretary of State said that the Scottish Government has “sat” on the £20.99 million that the UK Government had given the Scottish Government to deliver Phase 2 of broadband rollout.⁵⁹ He said this has caused slow progress on broadband delivery in Scotland:

The latest funding [£20.99m] that we gave was announced in February 2014. It is a source of deep frustration to me that the procurement for that broadband roll-out, where we allocated the money in 2014, only began in December 2017, some three and a half years later, and indeed the procurement process chosen by the Scottish Government is a slower form of procurement than we use in the UK Government. That means that the roll-out of the subsidised broadband system in Scotland has been slower than it could well have been...⁶⁰

He said that, as a result, the UK Government will work more directly with local bodies in Scotland on broadband rollout on future broadband delivery, “in the same way as we do with English local authorities”.⁶¹

28. In response the Cabinet Secretary said that DSSB took a different approach to procurement from local bodies in England. In England, individual county councils or local enterprise partnerships have responsibility for rollout: they operated a phased approach, with separate procurements for Phases 1 and 2 of the UK programme. The Scottish Government chose to design their programme as a large-scale rollout that covered all of Scotland, and combined Phases 1 and 2. He said that this meant that when the £20.99 million was allocated, DSSB was not complete:

we designed the DSSB programme, with local authority partners, to avoid the need for successive small-scale procurements. At the point when we were allocated the funds, the DSSB programme still had several years to run and the precise coverage to be delivered had yet to be finalised.⁶²

He said that because of this the Scottish Government could not launch another procurement to use the additional funding without risking legal challenge, and that this was discussed with UK Government officials at the time:

Had we launched another procurement at that point, before the DSSB coverage footprint was known, the uncertainty over the target premises

58 Department for Culture, Media and Sport, UK Government ([DCS0104](#))

59 [Q461](#)

60 [Q459](#)

61 [Q474](#)

62 Fergus Ewing MSP, [Letter to the Chair from Fergus Ewing MSP on digital connectivity](#), 3 May 2018

would have made it impossible for any supplier other than BT to bid; and the whole process would have been at risk of legal challenge on that basis. This was discussed and agreed at the time with BDUK officials.

We also explored the possibility of adding the £20.99 million to the DSSB contracts but, this option was in fact removed by the UK Government, which allowed a UK-wide state aid agreement with the EU to lapse in 2015. It took a year for them to negotiate a new agreement with the EU, the terms of which precluded any further investment in the DSSB (and all other BDUK framework) contracts.⁶³

The Scottish Government has said that it will use the £20.99 million as part of the total £600 million of funding for the Reaching 100% (R100) programme, which is the next stage of their rollout plan and aims to deliver broadband to the final 5% of Scotland.⁶⁴

29. In response, the Secretary of State said that the design of the DSSB procurement was not different from the process followed by local authorities in the rest of the UK, arguing that a number also chose to “fund and buy broadband delivery as a collective rather than individually. He said that “other local bodies have undertaken the same exercise and have been able to procure a second contract”⁶⁵ and added:

To be clear, BDUK advised the Scottish Government to follow the same procurement path as other local authorities and gave guidance on how any build overlap could be managed. There was no formal agreement between BDUK and the Scottish Government to not follow this advice.⁶⁶

There is clearly a difference in opinion on whether there had been agreement between the two Governments on how this funding was to be used, which we have not been able to resolve during the course of the inquiry.

Future relationship

30. We explored with witnesses how the two Governments have worked together on broadband delivery. Aberdeen City Council told us that the relationship was broadly positive saying that “on the whole, the UK Government, the Scottish Government, Local Authorities and supplier communicate well”.⁶⁷ Others had a more critical view: Scottish Rural Action told the Committee that lack of interaction between the two Governments “blocked” progress,⁶⁸ and Hugh Aitken, CBI, and Stuart Mackinnon, FSB, both argued that a more “joined-up” strategy was needed between governments and other stakeholders.⁶⁹

63 Fergus Ewing MSP, [Letter to the Chair from Fergus Ewing MSP on digital connectivity](#), 3 May 2018

64 [Q294](#)

65 Secretary of State for DCMS, [Letter to the Chair from the Secretary of State for Digital, Culture, Media and Sport on digital connectivity](#), 13 June 2018

66 Secretary of State for DCMS, [Letter to the Chair from the Secretary of State for Digital, Culture, Media and Sport on digital connectivity](#), 13 June 2018

67 Aberdeen City Council ([DCS0058](#))

68 Balquhider Community Broadband ([DCS0090](#)), Scottish Rural Action ([DCS0056](#))

69 [Q177](#), [Q178](#)

31. Both ministers described how the officials from both Governments have worked together on previous programmes, and continue to meet regularly to discuss future policies such as the UK Government’s Universal Service Obligation.⁷⁰ The Secretary of State said:

I have been very, very clear throughout this process that [...] the work together at a technical level must continue. My officials have worked with the Scottish Government to try to speed this along, and we remain open to doing that as much as possible. In a way I would love to get to the position where we can put the debate behind us.⁷¹

Fergus Ewing MSP proposed “resetting the relationship” between the two Governments,⁷² saying that establishing “constructive relations with the UK Government” was essential to overcoming the challenges of improving Scotland’s broadband coverage.⁷³

32. During the course of this inquiry, it was clear that there is intense political disagreement between the UK and Scottish Governments about the rollout of broadband in Scotland. We note that the issue of how £21 million was scheduled into procurement processes has led to disharmony between the two Governments, that all parties initially contributed £412 million to this programme and that £600 million is committed to the R100 programme. Whilst there is clearly discord over the different approaches adopted by both Governments, they are united in wanting to provide broadband coverage to the whole of Scotland. We welcome the acknowledgement from both ministers that the relationship needs to improve and their commitment to building on the collaboration that continues to take place between officials. *We recommend that the UK and Scottish Governments take steps to improve their relationship on broadband delivery and find ways to effectively work together to provide coverage to the whole of Scotland, putting past disagreements behind them.*

70 [Q312](#), [Q431](#). We discuss the USO further in Chapter 4.

71 [Q522](#)

72 [Q261](#)

73 [Q261](#)

4 Broadband for the “final 5%”

33. As broadband coverage across the UK continues to improve, the policy focus for both the Scottish and UK Governments is shifting onto the problem of how to provide superfast broadband coverage to citizens living in the hardest to reach areas—the “final 5%” that will not be connected through current rollout programmes. The UK Government is addressing this issue by putting obligations on providers to provide minimum service levels, whilst the Scottish Government is continuing the approach of subsidising commercial roll-out through its Reaching 100% (R100) programme.

Reaching 100%

34. The Scottish Government’s R100 programme aims to provide coverage to the final 5% of the Scottish population by subsidising the rollout of broadband by commercial providers. Launched in June 2017, R100 aims to deliver superfast broadband (30Mbps) to all premises in Scotland by March 2022. It is designed primarily as a rollout programme to three regional lots in rural Scotland. It will also include a demand-led element in which premises not covered by the rollout will be able to apply for vouchers to subsidise superfast broadband provision.⁷⁴ The R100 programme is worth £600m which is made up of £579.01m from the Scottish Government and the £20.99m that the UK Government allocated to DSSB in 2014.⁷⁵

35. Fergus Ewing argued that the UK Government should provide more funding for R100. Whilst praising the £100.8m that the UK Government contributed to the previous DSSB programme,⁷⁶ the Cabinet Secretary criticised the £20.99m contribution to R100, arguing that the UK Government’s contribution should be comparable to that made to DSSB:⁷⁷

A purist would say that the contribution, because it is wholly reserved, should be 100%. A pragmatist might say that the DSSB contribution, where the UK put £100 million in, would be a comparator, which, if followed, would lead to a contribution of £218 million by the UK Government for our £100 million [...] Funding needs to be sorted out, and I have asked the UK Government—and Mr Hancock in person—to make a more commensurate contribution.⁷⁸

36. In response the Secretary of State commented that the UK Government are unwilling to provide more funding:

When the UK Government chooses, as a policy decision, to fund money to try to solve problems for people in Scotland, and chooses to fund that money through the Scottish Government, and the Scottish Government does nothing with it for several years, you can understand why the amount of money does not go up.⁷⁹

74 Scottish Government ([DCS0120](#))

75 Fergus Ewing MSP, [Letter to the Chair from Fergus Ewing MSP on digital connectivity](#), 3 May 2018

76 [Q280](#)

77 [Q255](#)

78 [Q255](#)

79 [Q481](#)

He also outlined the funding that the UK Government had already contributed relative to Scotland's population:

Scotland has received 17% of UK funding for superfast broadband, although it comprises roughly 8% of the population. This means there has been more than double the spending per person in Scotland on superfast broadband by the UK Government than there has been for the rest of the United Kingdom.⁸⁰

37. The Committee welcomes the actions of both Governments to provide broadband coverage to the “final 5%”. People in rural areas face a much greater challenge in getting connected and this should be reflected in how funding for broadband delivery is allocated. We recommend that the UK Government increase its current level of investment to reach the last 5%.

Universal Service Obligation

38. In December 2017, the UK Government announced its Universal Service Obligation (USO) which will give every household in the UK the legal right to access broadband speeds of at least 10Mbps by 2020.⁸¹ Under this scheme a universal service provider will be obliged to connect premises that do not currently receive a service of 10Mbps in response to “reasonable requests” up to a cost threshold of £3,400.⁸² Ofcom has been given responsibility for implementing the scheme over the next two years. This includes identifying a universal provider who will be required to offer the service and establishing an industry levy to fund delivery.

10Mbps download speed

39. Whilst broadly supporting the need for a universal broadband service, some witnesses suggested the 10Mbps download speed was “much too low” for future demand.⁸³ Dr Lorna Philip, University of Aberdeen, raised concerns about the demands on speed in the future.⁸⁴ Ettrick and Yarrow Community Council said:

... we consider the 10Mbps standard is wholly inadequate, and ill-informed, and will prove to be a brake on the longer-term capacity aspirations.⁸⁵

Other witnesses argued that if the USO was set at 10Mbps, this figure should represent the absolute minimum consumer experience of speeds. Which? said that 10Mbps should be the actual speed consumers *will* receive in their homes at peak times, not just the speed they *could* receive.⁸⁶ Expert witnesses argued that 10Mbps should be a “safety net” or floor, rather than a minimum target.⁸⁷

80 [Q464](#)

81 UK Government press release, [High speed broadband to become a legal right](#), 2017

82 House of Commons Library briefing, [Superfast broadband coverage in the UK](#), 2017

83 Borders Community Broadband ([DCS0028](#)), Cordelia Galley ([DCS0075](#))

84 [Q95](#)

85 Ettrick and Yarrow Community Council ([DCS0064](#))

86 [Q23](#)

87 [Q27](#)

40. The Government’s decision to set the USO download speed at 10Mbps was based on technical advice from Ofcom who said this figure reflected the “need to get decent broadband out to everybody as soon as possible” and they were concerned that a higher specification could risk increasing the direct costs of intervention and displacing private sector investment.⁸⁸ Ofcom has said that it expects “capacity demands on broadband networks to continue to rise” and “it is very likely that an initial 10Mbps rate would need to be reviewed in the future.”⁸⁹ The Secretary of State said that there would be regular reviews to see whether the 10Mbps should be increased.⁹⁰ The Digital Economy Act 2017 allows for the USO to be reviewed at any time and requires that it be reviewed when the take up of superfast broadband (30Mbps) reaches at least 75%.

41. Consumers’ data usage is projected to increase by 50% a year and by the point of USO delivery in 2020 we are concerned that its 10Mbps download speed will not meet consumer needs. We recommend that the UK Government reviews the specification of the USO in the next 6 months, as it has already made provision for in the Digital Economy Act, to ensure the policy is designed to meet the evolving needs of consumers. To keep pace, we recommend that the Government consider increasing the 10Mbps minimum download speed, and specify that this should be the speed consumers receive at all times, including peak periods.

£3,400 cost threshold

42. The USO has a “reasonable cost threshold” of £3,400 for connecting any one property to a USO capable network. The owner of the premises will have to meet the additional costs above this threshold or do some of the deployment work themselves to reduce the cost. Witnesses told us that this £3,400 cap will rule-out some premises in remote rural areas from accessing the internet. The Scottish Chambers of Commerce Network said that the cap will cause “difficulty in bringing access to 100% of premises”.⁹¹ Robert Emmott, representing Comhairle nan Eilean Siar, said “if you cap it at £3,400, that is not going to get to the most remote places.”⁹²

43. To minimise the number of premises that are above this threshold, the USO provider will also have to aggregate demand for connections in a local area to bring down the cost of connecting each individual property.⁹³ Ofcom’s modelling suggests that this would bring the costs of connecting 99.8% of premises within the threshold.⁹⁴ However, in some locations it will be expensive to deliver a USO connection: Ofcom have said that it could cost up to £45,000 to deliver to certain premises in the 0.2%.⁹⁵

44. Which? told us that the bringing together (aggregating) of requests for connections under the USO was a sensible way to reduce cost but highlighted that there needs to be a simple and streamlined way for consumers to put in a request for a connection. They said that once a few people request connections in a community, Ofcom should ensure all other

88 Ofcom, [Achieving decent broadband connectivity for everyone: Technical advice to UK Government on broadband universal service](#), December 2016

89 Ofcom, [Technical advice on a broadband USO](#), 2016

90 Q523

91 Scottish Chambers of Commerce ([DCS0097](#))

92 [Q143](#)

93 Ofcom ([DCS0119](#))

94 DCMS, [A new broadband USO: Government’s response to consultation on design](#), March 2018

95 House of Commons Library briefing, [A Universal Service Obligation \(USO\) for Broadband](#), December 2017

households have adequate time to also send a request for this first deployment. Otherwise, the remaining households could be permanently excluded from further deployments if their costs are above the £3,400 threshold, as there might not be enough people to bring the costs of a second round of deployment under the cost threshold.⁹⁶ Ofcom plans to consult on their approach to demand aggregation, including any practical implications for consumers, in late 2018.⁹⁷

45. Whilst it appears that most households will be able to be connected with the USO's £3,400 cost threshold, there remains a risk that consumers in the most remote areas will be excluded, even with the plans for communities to pool demand to reduce costs. We call on the UK Government to set out in its response to this Report what additional support will be provided for consumers where the cost of connecting their premise is above the USO cost threshold, to ensure those consumers can enjoy the same basic standard of service that is enjoyed by the rest of the UK.

46. Ensuring communities can effectively come together to pool their demand for broadband connections will be essential to the success of the USO, by reducing the costs of each individual connection and bring more under the threshold. This process of "demand aggregation" must be designed around the consumer to ensure no household misses out on the main deployment of the USO to their community. We recommend that Ofcom directly consult communities on the design of the aggregation process and require the USO provider to run a comprehensive communications campaign to ensure that all consumers are aware of their right to request a connection.

Impact on consumer bills

47. Some witnesses were concerned that the USO will increase consumer bills. This is because all providers will contribute to the costs of the USO via an industry levy, which will be used to meet the costs of delivering the USO by the universal service provider, and companies may decide to pass this additional cost onto consumers.⁹⁸ Ofcom will design the levy and decide who will contribute to it. The UK Government have said the industry cost-sharing mechanism will "enable the designated universal service provider(s) to recover any unfair net cost of the obligation via contributions to a fund by others in the sector."⁹⁹

48. When we raised this with Ofcom, they confirmed that "it is certainly likely that providers would pass on at least part of those costs to consumers."¹⁰⁰ Ofcom's impact modelling predicted that the USO could cause a 1–2% increase on typical monthly household spend on fixed voice, internet and mobile services, depending on the USO's technical specification.¹⁰¹ Which? said that Ofcom should consider the impact on consumer bills as they move forward with the design of the USO.¹⁰²

96 Which? (DCS0094)

97 Ofcom, [Call for expression of interest: Implementing the Broadband Universal Service Obligation](#), June 2018

98 ISPreview, [Scotland Seeks Fair Funding and Criticises UK 10Mbps Broadband USO](#), 16 April 2018

99 DCMS, [A new broadband Universal Service Obligation: Government's response to consultation on design](#), March 2018

100 [Q413](#)

101 Ofcom, [Achieving decent broadband connectivity for everyone](#), 2016

102 Which? (DCS0094)

49. We welcome the Government’s intention to minimise the cost of the USO for the public by funding it through an industry levy, but are concerned that consumers will end up paying for it indirectly through higher bills. *We recommend that Ofcom monitor the impact of the USO on consumer bills, publishing its findings within one year of the USO launch.*

USO and R100

50. The UK Government’s USO and the Scottish Government’s R100 policies have broadly similar aims: to provide broadband coverage to the hardest-to-reach areas. The USO will adopt an entirely demand-led approach where customers must apply for a connection; R100 is primarily a rollout programme, but is likely to also have demand element with financial support given to residents in extremely remote areas that are not covered in the initial to fund the delivery of broadband to their properties.¹⁰³ This will mean that some premises will be eligible for support from both programmes.

51. The Scottish Government told us that they saw opportunities to marry up the design of the USO with the on-demand element on R100.¹⁰⁴ Because the USO is offering a 10Mbps connection funded by an industry levy, the Scottish Government told us that they would like to explore the option of giving people the option of scaling up to a 30Mbps connection—with the Scottish Government potentially funding the difference.¹⁰⁵ In a letter to the Secretary of State on 16 May, Mr Ewing said:

I am pleased that officials have indicated a willingness to ensure that the two interventions work together towards a positive outcome ... It is vital that, at the very least, we design a single point of entry for the public to avoid confusion but I see a far greater prize; ensuring that the public funding committed to the R100 programme is used in the most effective way possible and does not wholly displace industry funding through the USO.¹⁰⁶

The Scottish Government has proposed establishing a joint USO Working Group to facilitate this alignment, they argued that a “pan-UK standing committee” is “an effective way of ensuring that the USO is developed in a way that benefits all parts of the UK.”¹⁰⁷

52. The Secretary of State told us that the interaction between the USO and R100 was a “challenge” that the two Governments had to get right.¹⁰⁸ Ofcom also said that there is “potential - particularly the on-demand element of the R100 scheme - to find a sensible way of co-ordinating that with the on-demand elements of the USO scheme.” Steve Unger, Chief Technology Officer, Ofcom suggested:

The idea there, I think, is that you might be able to find some way of combining an R100 voucher with the USO funding in order to perhaps increase the number of people who are eligible for USO. That is the thing that we are exploring.¹⁰⁹

103 Scottish Government ([DCS0120](#))

104 [Q276](#)

105 Scottish Government ([DCS0120](#))

106 Cabinet Secretary for the Rural Economy and Connectivity, Correspondence to Rt. Hon. Matt Hancock MP, 16 May 2018

107 Scottish Government ([DCS0081](#))

108 [Q527](#)

109 [Q430](#)

53. The UK Government’s USO and the Scottish Government’s R100 programme are different approaches to the same goal: providing broadband coverage to the most remote areas. There will be some areas that could benefit from both the USO and R100 and it is vital that the two programmes work together effectively. *We recommend the two Governments establish a joint USO working group to coordinate activity between the two programmes. One of the first jobs of this group should be to explore the feasibility of combining the on-demand elements of R100 with the USO to ensure that R100 funding does not displace industry funding provided under the USO.*

Community broadband schemes

54. Community broadband schemes are broadband programmes that are run by local groups, often in areas which are not covered by commercial or publicly funded roll-out.¹¹⁰ Community schemes can take many forms, including buying into existing roll-outs and building community owned and operated infrastructure.¹¹¹ In Scotland, some projects have been supported by Community Broadband Scotland, a Scottish Government initiative which has assisted communities to develop their own solutions, and others operate entirely independently.¹¹²

55. Academics specialising in rural issues and community representatives told us that broadband initiatives benefitted from being able to tailor their service to the needs of local communities, as well as having secondary benefits such as strengthening local community identity.¹¹³ High-Speed Universal Broadband Services (HUBs), a provider of backhaul and other services to community broadband networks in Scotland, told us that community networks are “uniquely positioned to innovate in response to local needs. They thrive by reinvesting revenue in local infrastructure and services in ways that are infeasible for larger incumbents.”¹¹⁴ Dr Marwan Fayed, Director at HUBs, highlighted that community broadband networks are growing: “collectively in Scotland... there are about 4,000 premises being served by community networks, and that is projected to grow by 50% in the next 12 to 18 months.”¹¹⁵

56. However, community broadband schemes also face challenges. Some expressed concern about the impact government interventions can have on the viability of their network.¹¹⁶ They questioned the value of public funding being used to subsidise other operators deploying networks in areas where they operate, with HUBs describing it as “anti-competitive behaviour”.¹¹⁷ A community broadband project in Heriot said that they were told Openreach was planning to overbuild their network to provide full-fibre coverage, supported by Government funding. Whilst welcoming the benefits of this coverage, they questioned “why Heriot has been singled out for such a complete transformation at a cost of at least £1 million, when the community network was built for less than £100,000.”¹¹⁸

110 House of Commons library, [Roll-out of broadband to rural communities in Scotland](#), November 2017

111 Gov.uk, [Introduction to Community-led Schemes](#), February 2018

112 House of Commons library, [Roll-out of broadband to rural communities in Scotland](#), November 2017

113 [Q102](#)

114 High-Speed Universal Broadband Services CIC ([DCS0066](#))

115 [Q323](#)

116 High-Speed Universal Broadband Services CIC ([DCS0066](#)), Killlearn Community Council (KCC) & Killlearn Broadband Group (KBG) ([DCS0057](#))

117 [Q329](#)

118 Heriot Community Broadband ([DCS0063](#))

57. When we raised this issue with Ofcom, they said they were supportive of community broadband schemes and committed to “making sure the way we design a public intervention does not disrupt business.”¹¹⁹ Steve Unger, Chief Technology Officer, said that they will design the Universal Service Obligation so that the provider does not “undermine” community broadband schemes in areas which have them.¹²⁰

58. Community broadband providers have played an important role in providing coverage to remote areas of Scotland, which have been under-served by larger providers. We heard that a number of schemes felt they were at risk of being overbuilt by Government-funded interventions. We therefore welcome Ofcom’s commitment that they will design the future USO in a way that does not undermine community broadband schemes.

119 [Q444](#)

120 [Q444](#)

5 Full-fibre future

59. Full-fibre technology is the next generation of broadband technology, capable of providing download speeds of 1Gbps (1,000Mbps).¹²¹ It uses fibre rather than copper cable along the whole connection, which can transfer more data over longer distances and deliver a more reliable service. However, it can be expensive to deploy in remote or rural locations because operators need to lay fibre optic cables over much longer distances. Currently, most premises in Scotland, and the wider UK, rely on Openreach's network of copper telephone lines for at least part of their connection—only 2% of Scottish premises can access full-fibre.¹²²

60. The UK Government's strategy is to improve full-fibre coverage by funding rollout, promoting competition and reducing regulatory barriers to commercial deployment. In May 2018, the Chancellor of the Exchequer pledged to install full-fibre superfast broadband connections to 15 million premises by 2025, and a nationwide full-fibre to the premises network by 2033.¹²³ When asked about balancing full-fibre rollout with delivering coverage to the final 5%, the Secretary of State for Digital, Culture, Media and Sport said:

I think you have to do both. Making sure that we can get the coverage to the final 5% across the UK—including in Scotland—is incredibly important, but at the same time we have to get started on the next generation of technology.¹²⁴

Funding

61. The UK Government has established two funds to support investment in full-fibre networks by businesses and local authorities:

- **Digital Infrastructure Investment Fund**, a £400m Government investment which is expected to release over £1bn funding for industry through private finance; and the
- **National Productivity Investment Fund (NPIF)**, a £740m investment in full-fibre telecommunications infrastructure.¹²⁵

During our inquiry, witnesses focused on funding from the Gigabit Voucher Scheme, which is part of the NPIF.

Gigabit Broadband Voucher Scheme

62. In March 2018 the UK Government launched its £67m Gigabit Broadband Voucher Scheme. Vouchers can be used by small businesses and the local communities around them to contribute to the installation cost of faster connections over gigabit-capable infrastructure. Small to medium-sized businesses can claim a voucher worth up to £3,000 and residents can claim a voucher worth up to £500 as part of a group project, which are then pooled together and used to subsidise the delivery of fibre networks to that

121 House of Commons library, [Superfast Broadband Coverage in the UK](#), March 2017

122 Ofcom, [Connected Nations Update: Spring 2018](#), 2018

123 ISPreview, [Chancellor Targets Full Fibre for Majority of UK Premises by 2025 UPDATE3](#), 22 May 2018

124 [Q543](#)

125 House of Commons library briefing, [Superfast broadband coverage in the UK](#), 2017

community by a commercial provider. At present, all communities' bids must include at least one business, and the vouchers from business must make up at least half of the total funding.¹²⁶

63. Providers largely supported the scheme: Virgin Media said that the demand voucher schemes make areas more commercially viable¹²⁷ and the Independent Networks Cooperative Association said they are a helpful way of encouraging smaller-scale projects.¹²⁸

64. Whilst there was support from broadband providers, there was more uncertainty from the business community, who are the main audience for the voucher scheme. The Scottish Chambers of Commerce (SCC) reported that “there has not been huge uptake of the gigabit voucher scheme” in Aberdeen as part of the pilot.¹²⁹ Both the SCC and the Federation of Small Businesses suggested to us that this was a communications challenge: businesses need to be made aware that the scheme exists.¹³⁰ The SCC said there was a need for a “more substantial communications plan to point businesses and individuals to the support that is available” and that there was also a role for representative bodies such as themselves to provide “clustering mechanisms for voucher initiatives.”¹³¹

65. The requirement for half of the funding to come from business applications was seen as a potential barrier for smaller communities. High-Speed Universal Broadband Services (HUBS), a community broadband network which specialises in providing full-fibre networks to rural and remote communities, highlighted that “the business-to-residence ratio [is a requirement] that very few communities can meet”, because of the small number of properties in these areas.¹³²

66. Whilst there is still progress to be made in providing universal broadband coverage, investment in full-fibre is vital to the UK's economic growth. We welcome UK Government funding for full-fibre investment, particularly through the national rollout of the Gigabit Voucher Scheme. We recommend that the Gigabit Voucher Scheme works closely with business groups to raise awareness of the available funding and support businesses and communities to create viable bids.

67. Currently, at least half of the total value in a bid under the Gigabit Voucher Scheme must come from vouchers given to businesses rather than residents. We are concerned that this will be difficult for communities in rural areas to achieve, denying them access to a potential useful source of funding. The UK Government should consider dropping this requirement for bids in rural areas of Scotland, which will allow more communities to take advantage of the scheme.

126 DCMS, [Gigabit Broadband Voucher Scheme](#), 2017 (accessed July 2018)

127 Virgin Media ([DCS0093](#))

128 [Q232](#) [Malcolm Corbett]

129 [Q179](#) [Charandeep Singh]

130 [Q179](#) [Charandeep Singh and Stuart Mackinnon]

131 [Q179](#) [Charandeep Singh]

132 [Q331](#)

Competition in full-fibre delivery

68. Competition between providers is vital to driving investment and innovation in communication networks and encouraging competition in the market is central to the UK Government's strategy for increasing fibre deployment. There are two main types of providers operating in the broadband market:

- **Retail communications providers** who sell broadband services to customers, either by using their own network or by paying another provider (wholesale communications provider) to supply their customers.
- **Wholesale communications providers** build, own and operate networks; they use this to sell broadband services to retail communications providers or directly to customers.

BT is the largest provider of internet services in the UK and most other retail communications providers (for example Sky and TalkTalk) buy access to BT Openreach's network.¹³³ These providers are unable to compete with BT on the speed of their service (as they are using the same infrastructure) but can compete on price or customer service. Others, such as Virgin Media, have invested in their own networks so they can offer different speeds from those available to BT. Some companies like CityFibre, just operate at a wholesale level and do not offer services directly to consumers.

Retail competition

69. Retail communications providers can buy access to Openreach's ultrafast and superfast networks (an end-to-end service), or they can pay for access to the copper network and then install their own equipment from BT exchanges to premises (known as Local Loop Unbundling (LLU)).¹³⁴

70. In March 2018 Ofcom concluded their Wholesale Local Access review which looked at the regulation of services which use a fixed connection. As part of this review,¹³⁵ Ofcom announced a reduction in the amount Openreach can charge telecoms companies to use its superfast broadband network to deliver service to their customers.¹³⁶ Ofcom will gradually cap the amount Openreach can charge rivals to use its basic superfast broadband service, which generally offers speeds of up to 40Mbps, to £12.06 a month by 2020/21.¹³⁷ Ofcom said:

Regulating this price will help BT's rivals to compete for customers, while several build their own full-fibre networks, as well as protecting consumers from high prices during this period.¹³⁸

133 BT Openreach is the infrastructure division of BT Group which is the UK's largest fixed broadband provider

134 Ofcom, [Wholesale Broadband Access Market Review 2018](#), June 2018

135 Ofcom also announced that it will *not* regulate the prices of Openreach's fastest wholesale superfast broadband products, this is designed to incentivise operators to build full-fibre networks.

136 Ofcom, [Wholesale local access market review](#), 28 March 2018

137 Ofcom, [Ofcom confirms new rules to boost Britain's broadband](#), 28 March 2018

138 Ofcom, [New Ofcom rules to boost full-fibre broadband](#), 23 February 2018

71. As well as keeping prices low for customers,¹³⁹ Ofcom’s aim is also to encourage providers to invest in full-fibre networks. TalkTalk stated that “the lowering of the wholesale price for fibre to the cabinet [...] increases both Openreach’s incentives to invest and the ability of others like TalkTalk to invest”.¹⁴⁰ We were told that the current wholesale price makes it difficult for other internet providers to compete on retail price, and therefore to attract the customer base needed to raise the money for investment in their own networks.¹⁴¹ For Openreach, TalkTalk argued that the price cap will compel them to invest in new full-fibre as the income they get from the existing copper networks will reduce.¹⁴²

72. However, not all companies thought that this reduction would encourage providers to invest more in fibre networks. Virgin Media—a infrastructure-level competitor of BT—pointed out that lowering the price of wholesale access could make providers more likely to rent because access is cheaper. They said that as well as having a “direct impact on people [like themselves] that are independently investing in their own infrastructure”, this could also mean providers who have historically rented are less likely to invest in their own full-fibre networks.

73. A similar view has been expressed by Mark Jackson of independent telecoms site IS Preview, who said that Ofcom “runs the risk of making slower [partial fibre] so cheap that it could discourage investment in new/ultrafast networks, which might struggle to compete against the extremely low pricing.”¹⁴³ However, TalkTalk told us that the price reduction had not affected their own plans to invest in infrastructure: they are planning to start building and operating their own fibre network.¹⁴⁴

74. Openreach and BT told us that they recognised and accepted Ofcom’s objectives: Kim Mears, Openreach, commented that the reduction in pricing is designed to “create an environment that supports competition”¹⁴⁵ and Brendan Dick, BT, said that Ofcom “is trying to create a scenario where... the prices are right to encourage investment.”¹⁴⁶

75. Competition is fundamental to driving innovation, investment in infrastructure, and customer choice. Therefore, we welcome Ofcom’s action to stimulate retail competition by cutting the prices Openreach can charge providers. This is clearly designed to encourage investment in full-fibre, however we heard from some providers who argued that it may not have this effect and could hinder full-fibre investment by companies other than Openreach. We recommend that Ofcom carefully monitors the impact of the price cap on full-fibre investment and revisits the affect of the price cap on Openreach’s superfast broadband service if necessary.

139 ISPreview, independent telecoms site, has noted that there has been “heavy price discounts on related packages over recent months” from Vodafone, TalkTalk and Plusnet. (IS Preview, [Margot James MP Hints ISPs Should Pass FTTC Price Cut on to Homes](#), accessed 3 July 2018)

140 [Q223](#) [Iain Wood]

141 [Q223](#) [Iain Wood]

142 [Q223](#) [Iain Wood]

143 ISPreview, [Ofcom Changes to Boost UK Full Fibre Broadband and Cut FTTC Prices](#), 23 February 2018

144 Financial Times, [TalkTalk, Infracapital in £1.5bn full fibre broadband pact](#), 8 February 2018

145 [Q224](#) [Kim Mears]

146 [Q224](#) [Brendan Dick]

Infrastructure competition

76. Another measure that Ofcom has introduced as part of the WLA Review is a requirement for Openreach to make it easier for rival providers to access its telegraph poles and underground tunnels to lay fibre, reducing the costs of them deploying their own, alternative, network. Openreach has been required to offer competitors access to its ducts and poles to lay their own network since 2010. However, this new measure puts additional responsibilities on Openreach to clear blocked tunnels, ensure there is adequate space on telegraph poles and release a digital map of its network. Ofcom predicts it will reduce cost for access by 50% - from £500 per home to £250.¹⁴⁷

77. TalkTalk praised duct and pole access reform, saying that it “could make it significantly cheaper and quicker to rollout new networks, strengthening competition and keeping prices low for customers”.¹⁴⁸ Virgin Media, which has recently trialled using Openreach’s ducts and poles to deploy their network, told us that the administrative side of getting access had been “significantly improved”.¹⁴⁹ However, some providers told us that they have been reluctant to apply for access because this notifies Openreach as to where they are building. They would be concerned that this could “provoke a competitive response”.¹⁵⁰

78. We also welcome Ofcom’s measures to stimulate infrastructure-based competition. However, previous efforts to encourage greater use of Openreach’s ducts and poles for other companies to lay their own networks have had limited success. We recommend that Ofcom monitor the uptake of Openreach’s ducts and poles. If this reform does not lead to a substantial increase, Ofcom should revisit the issue next year to see what other action could be taken to encourage this form of competition.

147 Ofcom, [New Ofcom rules to boost full-fibre broadband](#), 23 February 2018

148 TalkTalk ([DCS0096](#))

149 [Q223](#) [Daniel Butler]

150 [Q249](#)

6 Mobile coverage

79. Mobile phones play an increasingly important role in daily life: adults are now more likely to use a smartphone than a computer to go online.¹⁵¹ High quality and reliable mobile phone coverage is now expected by consumers no matter their location, and many businesses rely on it to work on the move.¹⁵² This trend is likely to increase with mobile data traffic growing at a rate of around 60% a year, enabled by technology development allowing consumers to carry out more activities wirelessly.¹⁵³ However, mobile coverage is still inconsistent across Scotland, and the rest of the UK. Brendan Gill, CEO of OpenSignal, told us that “there is still a lot to be done to improve the access to mobile coverage” and that while universal coverage is “now talked about as if we were virtually there, [...] when we look at the evidence, there is still a gap.”¹⁵⁴

80. Whilst improving basic coverage was a key focus for the inquiry, we also heard about the drive towards preparing the mobile sector for 5G technology. 5G is the fifth generation of mobile connectivity which offers faster download speeds, greater capacity and a better user experience. Ofcom has said that deployment of 5G could be available in the UK sometime in 2020 with initial pre-commercial deployments expected to start from 2018.¹⁵⁵

Mobile availability in Scotland

81. Scotland’s rural geography means that it faces similar issues with mobile coverage as it does with broadband. There is less of an incentive for providers to invest in areas that have a low population density (and therefore potential customer base) and difficult geographical challenges increase the cost of deployment. While Ofcom’s Spring 2018 Connected Nations Update found that mobile coverage in Scotland has improved, and there are now 1.6 million fewer hectares of 4G¹⁵⁶ not-spots than in June 2017,¹⁵⁷ there are still large areas of Scotland’s landmass where it is not possible to receive a mobile voice (17%) or data (18%) signal.¹⁵⁸ Witnesses told us that not-spots can exclude rural communities, for example Ettrick and Yarrow Community Council said:

Mobile ‘phone “not spots” coupled with poor broadband can lead to social exclusion and to a risk to personal safety if residents are unable to contact emergency services, and are a barrier to business development and working from home.¹⁵⁹

82. Ofcom’s figures show that mobile coverage in Scotland lags behind the rest of the UK with only 30% Scotland’s land mass covered by 4G services from all operators, compared to 73% in England (see Table 3).¹⁶⁰ Mobile providers pointed out that this figure rises when coverage from *at least one* operator (“partial not-spots”) is considered. Although this

151 Ofcom, [Adults’ media use and attitudes](#), June 2017

152 Which? ([DCS0094](#))

153 Ofcom, [Mobile Data Strategy](#), 2016

154 [Q33](#)

155 Ofcom, [Enabling 5G in the UK](#), March 2018

156 4G is a generation of technology used to deliver mobile services, providing download speeds of over 10Mbps. It is mainly used to provide mobile data services. Earlier generations - 2G and 3G - deliver lower speeds. They are used to provide voice services or, in the case of 3G, voice and data.

157 Mobile UK, [Ofcom Connected Nations Spring Update](#), 2018

158 Ofcom, [Connected Nations Update: Spring 2018](#), 2018, Q390

159 Ettrick and Yarrow Community Council ([DCS0064](#))

160 Ofcom, [Connected Nations Update: Spring 2018](#), 2018

does not help consumers who can only use the service provided by their carrier. Andrew Ferguson, ThinkBroadband, said that some people in rural areas had resorted to having “two mobile phones with two different networks”, to maximise their chance of getting coverage on the move but sometimes still get nothing.¹⁶¹

Table 3: Geographic area covered by all operators - 4G

| | June 2016 | May 2017 | January 2018 |
|----------|-----------|----------|--------------|
| Scotland | 6% | 17% | 30% |
| England | 32% | 60% | 72% |

Source: Ofcom Connected Nations – Spring 2018 Update

83. The Secretary of State noted that the mobile coverage challenges that Scotland faces are “entirely due to topography and the huge swathes of Scotland with very, very few premises.” He highlighted the UK Government’s commitment to “getting good quality mobile coverage where people live and travel.”¹⁶² In this chapter we consider the main methods the Government is using to get mobile network operators (MNOs) to improve coverage: imposing coverage obligations and incentivising MNOs to share their network.

84. We recognise the huge improvement to Scotland’s mobile coverage in recent months, particularly considering its challenging geography. However, the ambition must be to achieve universal access to mobile coverage—communities in remote and rural areas must not be forgotten.

Coverage obligations

85. One of the main tools Ofcom have to improve coverage is imposing coverage obligations on mobile phone providers as part of the auction process for the spectrum MNOs use to provide mobile phone service. These obligations require the successful bidder to provide coverage to a certain percentage of the UK’s landmass, but leave it open to the provider to decide how best to achieve that outcome.

86. In 2014 all four main MNOs—EE, Orange, Three UK and Vodafone—agreed to provide coverage to at least 90% of UK landmass by the end of 2017, a commitment which they all met.¹⁶³ As part of the consultation for the next round of spectrum auctions, Ofcom have proposed establishing new obligations to build on this progress:

- a) A **premises obligation** which requires an operator to provide indoor coverage to 60% of premises, in each of the UK’s four nations, that currently have no signal.
- b) **Geographic obligations** which require the operator to provide good coverage across at least 92% of the total UK landmass. This would include specific targets for coverage in each UK nation: 92% in England, 92% in Northern Ireland, 83% in Wales and 76% in Scotland.¹⁶⁴

161 [Q37](#) [Andrew Ferguson]

162 [Q545](#)

163 Ofcom, [Mobile coverage obligation](#), 9 March 2018

164 Ofcom, [Improving mobile coverage: Proposals for coverage obligations in the award of the 700MHz spectrum band](#), March 2018

87. Witnesses broadly welcomed Ofcom’s move to introduce geographical coverage obligations.¹⁶⁵ The Federation of Small Businesses said that nation-specific coverage obligations would address the current gap between Scotland and England,¹⁶⁶ although they have also called for the Scottish target to be higher than the proposed 76%.¹⁶⁷ Ewan Sutherland, an independent telecommunications expert, said the proposals were a clear attempt to improve rural coverage but questioned whether Ofcom has properly assessed the alternatives and considered a more targeted approach, such as different coverage obligations for rural and urban areas.¹⁶⁸

88. Similarly, Which? said that specifying the obligations as a “simple proportion of landmass” means they are “too general and loosely defined”. They are concerned that providers will “opt for easier ways to meet the obligation by covering areas which are most easily served”.¹⁶⁹ They argued that coverage obligations should focus “specific unserved or underserved areas to deliver the greatest benefit to consumers” and suggested that Ofcom should consider targeting coverage on remote roads. Scotland has the lowest voice and data coverage on A&B roads in the UK, serving 56% and 50% of the road network respectively.¹⁷⁰ Mobile coverage on roads is pivotal for businesses: research from the Scottish Rural College identified “an inability to work flexibly or on the move because of poor mobile signals” as one of the major issues for the 800 rural businesses they surveyed.¹⁷¹

89. When we raised these concerns with Ofcom, they said that they set the nation-specific targets based on the “starting point for each nation” and would deliver a 12% improvement in Scotland’s coverage—more than any other UK nation. They also argued that if the obligations are too onerous companies simply would not bid for spectrum.¹⁷² Ofcom also said that they considered consulting on an obligation that was focused on roads but decided that the target for geographic coverage would deliver more coverage to more people.¹⁷³

90. We welcome the fact that Ofcom is consulting on the introduction of nation-specific coverage obligations for the next spectrum auction. We believe this will help ensure that Scotland’s challenging rural geography does not lead to its mobile coverage falling behind the rest of the UK, and recommend they are included in the next spectrum auction in at least as extensive terms as set out in Ofcom’s consultation.

91. However, even if these obligations are introduced there will still be some areas without coverage. We have heard that there is a particular issue with the quality of signal on Scotland’s A and B roads, which is important both for communication “on-the-move” and safety because large stretches of Scotland’s roads are in extremely remote locations. We recommend that Ofcom monitor the impact of its geographical coverage targets on mobile coverage on Scotland’s roads. If there is insufficient progress, Ofcom should consult on including specific targets for road coverage in future spectrum auctions.

165 Aberdeenshire Council ([DCS0095](#))

166 [Q180](#)

167 FSB, [Letter to the Chair from the FSB on digital connectivity](#), 20 April 2018, [Q288](#)

168 Sutherland Ewan ([DCS0109](#))

169 Which? ([DCS0116](#))

170 Ofcom, [Connected Nations Update: Spring 2018](#), 2018

171 Scotland’s Rural College ([DCS0111](#))

172 [Q449](#)

173 [Q450](#)

Improving coverage through infrastructure sharing

92. Sharing infrastructure can lower the cost of network deployment, stimulate migration to new technologies and enhance competition between providers.¹⁷⁴ There are two categories of mobile infrastructure sharing: passive and active.

- a) **Passive sharing** is when operators share physical space, for example buildings, sites and masts, but networks remain separate;
- b) **Active sharing** is when operators share elements of the mobile network, such as antennas, base stations and the core network. This includes national roaming, when a mobile customer uses a network not provided by their operator.

Passive sharing

93. Witnesses told us that whilst building mobile masts is crucial to improving coverage, constructing sites and masts to be shared by operators can make a significant difference in rural and remote areas. These areas are more expensive to build in, and providers have to get planning permission, so it is more economical and efficient to build infrastructure that can be shared. Also, because it is easier for more operators to provide a service in these areas, it creates competition, giving consumers more choices and drives down prices.¹⁷⁵

94. The National Infrastructure Commission has recommended mobile mast sharing as a way to “help improve coverage for the users of all networks across areas of poor coverage”.¹⁷⁶ One local resident in rural Ayrshire told us that sharing masts could help address resident’s concerns around “littering the countryside with aerials” because fewer masts are used by more operators.¹⁷⁷

95. Technology experts told us that passive sharing is viable: they noted that it is a “fairly typical commercial model” in many countries, where a third party normally manages the masts anyway.¹⁷⁸ However, Professor Rahim Tafazolli, University of Surrey, highlighted that there are multiple cost elements to building a mast site: developing the technology, buying the asset, deploying the technology and operating it. He said that infrastructure sharing only helps reduce the cost of the asset and it is important to consider the other elements. We consider barriers to deployment in the next chapter.¹⁷⁹

Emergency Services Network

96. Whilst the UK Government’s policy has shifted to focus on coverage obligations and away from its previous approach of funding the building of mobile infrastructure, it continues to invest in mobile signal broadcast points through its funding of the Emergency Services Network (ESN). The ESN is a new communication system for the three emergency services and other public safety users in the UK, which is delivered by EE using its commercial network. As part of developing the network, the UK Government

174 International Telecommunication Union, [Mobile infrastructure sharing](#), (accessed 22 June 2018)

175 Killearn Community Council (KCC) & Killearn Broadband Group (KBG) ([DCS0057](#))

176 National Infrastructure Commission, [Improving mobile coverage – letter from Lord Adonis to Ofcom Chief Executive](#), December 2017

177 Cordelia Galley ([DCS0075](#))

178 [Q45](#) [Ewan Sutherland]

179 [Q45](#) [Professor Tafazolli]

is spending approx. £1.2bn¹⁸⁰ to fund more than 500 new mobile mast sites, delivered by EE, across the UK, 300 of which will be in Scotland.¹⁸¹ Because emergency services are needed to cover the country, the ESN programme also involves building a further 300 sites in remote areas—Extended Area Services (EAS).¹⁸² Although the primary purpose of the EAS sites is to support the ESN, the intention is to allow a mobile provider to use these sites to host their own masts, improving the service they can offer in more remote areas of Scotland.

97. However, so far interest in other providers using these sites has been limited. As of May 2018, EE had only received formal interest in sharing two of 350 sites advertised.¹⁸³ EE said they are supportive of “multi-operator rural coverage” and told us that they “stand ready to support other MNOs when they express interest in site sharing”.¹⁸⁴ They told us that they share details on a weekly basis with other MNOs.¹⁸⁵

98. While part of the reason for current low interest from other operators may be because the ESN is in its early stages, some witnesses said that the cost of accessing the infrastructure could be a barrier. Vodafone told the Committee that the ESN wholesale price should be a “commercial rate that ensures use”, saying that the “cost of accessing sites must not be so high that there is no point doing it.”¹⁸⁶ Ardross Community Council said that the UK Government should “consider the use of arbitration to enable a fair commercial rent to be charged and reasonable access allowed for other operators.”¹⁸⁷

99. As the provider of the ESN network has a potential to gain competitive advantage from the Government’s funding of the network, the Government was required to get State Aid clearance from the European Commission for this programme. One of the conditions of this clear was that, to limit competition distortions, the ESN network would have to offer access to the network, on wholesale terms, to other mobile phone providers. The Commission said that this price should be set through agreements between MNOs or, if this cannot be agreed, set based on the advice of Ofcom.¹⁸⁸

100. The ESN network presents an invaluable opportunity for operators to improve coverage in rural areas, and has the potential to create competition in areas which have been poorly served previously. To achieve this, EE need to ensure they facilitate and encourage site-sharing in their building plans. We are concerned that there has been such little interest from other operators in sharing the sites so far. Ofcom should carefully monitor provider take-up of ESN site-sharing, and require EE to provide an update in early 2019. If take-up is still low, Ofcom should consider intervening to regulate the wholesale access price for ESN mast sites.

180 National Audit Office, [Upgrading emergency service communications: the Emergency Services Network](#), 2 July 2018

181 EE ([DCS0117](#))

182 EE ([DCS0117](#))

183 EE ([DCS0117](#))

184 EE ([DCS0117](#))

185 EE ([DCS0117](#))

186 [Q352](#)

187 Ardross Community Council ([DCS0080](#))

188 EE ([DCS0117](#))

Active sharing and national roaming

101. Active sharing is when operators share elements of the mobile network, such as antennas, base stations and the core network. Active sharing is already core to the UK's mobile phone network, which operates via two networks shared between the MNOs: one used by Three and EE and the other used by O2 and Vodafone. They compete as separate operators, using different radio frequencies, but these signals are received by jointly-owned antennas and backhauled over shared cables.¹⁸⁹ However this does not include sharing spectrum, and there has been debate about whether more should be done to encourage a form of spectrum sharing known as national roaming.

102. National roaming involves an agreement among operators to use each other's networks to provide services in geographic areas where they have no coverage. It allows users to make calls and use data, as long as one provider has signal in an area; the user does not need to have a contract with the provider. This is a similar process to "international roaming" which is when people use a network other than their home provider's when travelling abroad.

103. A 2014 DCMS consultation considered national roaming as a solution to partial not-spots (areas when not all providers have coverage).¹⁹⁰ However, the Government abandoned proposals in favour of imposing coverage obligations in spectrum auctions. The sector expressed notable opposition, arguing that it would harm competition and provide a poorer consumer experience.¹⁹¹ When we raised this issue with mobile operators, they explained that it would be likely to reduce the consumer experience with an increase in "dropped calls",¹⁹² impose additional costs on network operators, and inhibit investment. Paul James, O2, said: "...why would we invest if we felt that we could roam on someone else's network?".¹⁹³

104. One alternative to national roaming is '*macro not-spot*' roaming—this refers to operators making network sharing arrangements in targeted areas that are particularly affected by partial 'not-spots', rather than sharing across the whole network. A small-scale version of macro-roaming was introduced in the UK to enable the entry of Three into the mobile market—in certain areas Three customers could access EE's 2G network in absence of their normal service.¹⁹⁴ The British Infrastructure Group have suggested that "the ability of consumers to roam between networks in areas with partial 'not-spots' would encourage competition, as operators are incentivised to provide coverage in areas deprived of signal."¹⁹⁵ The National Infrastructure Commission have also recommended roaming, highlighting that it would guarantee consumers a strong signal.¹⁹⁶

189 The Register, [Vodafone and O2 to merge mobile networks](#), accessed June 2018

190 DCMS, [Tackling Partial Not-Spots in Mobile Phone Coverage: Consultation Document](#), 2014

191 British Infrastructure Group, [Mobile Coverage: A good call for Britain?](#), 2016

192 [Q385](#)

193 [Q385](#)

194 DCMS, [Tackling Partial Not-Spots in Mobile Phone Coverage: Consultation Document](#), 2014

195 British Infrastructure Group, [Mobile Coverage: a good call for Britain?](#), 2016

196 National Infrastructure Commission, [Improving mobile coverage – letter from Lord Adonis to Ofcom Chief Executive](#), December 2017

105. Oxton and Channelkirk Community Council said a form of macro-roaming would be the “quickest and simplest way to extend coverage” in their area:

Oxton has 4G with Vodafone and O2, 3G with EE but nothing with Three. The next village south (Lauder) has no Vodafone coverage but it does have O2 coverage. So why not compel Vodafone to allow Three to use its network in Oxton and for Vodafone to use O2’s coverage in Lauder.¹⁹⁷

106. However, MNOs had similar concerns to macro-roaming as they had to national roaming. Simon Miller from Three UK said whilst “regionalised roaming options could be a way of addressing coverage issues”, he noted that “what we charge one another to go on to another’s network” would be a potential hurdle.¹⁹⁸ Brendan Gill, CEO of OpenSignal, told us macro-roaming would “not solve everything because there are many areas where no provider has coverage and, therefore, roaming will not address the situation.”¹⁹⁹ Scottish Rural Action said that national roaming networks do not work in rural locations “where there is no coverage at all”, instead arguing that more should be done to “encourage the building of more masts in rural Scotland.”²⁰⁰ Aberdeenshire Council said they did not support roaming because “it would not promote the build of any new infrastructure.”²⁰¹

107. However, in other countries there is evidence that macro-roaming has delivered improved coverage in remote areas and not inhibited investment in infrastructure. The British Infrastructure Group notes that rural areas in Australia, the USA, Canada and New Zealand have all benefited from improved coverage through macro-roaming. Whilst having much less remote landmass than these countries, the UK faces similar challenges in the lack of competition between operators, “which targeted roaming arrangements are well placed to provide.”²⁰² In some countries, investment has increased as a result of this type of Government intervention: France implemented a system in 2003 targeted at rural areas which created 3,000 additional sites of mobile coverage by the end of 2009.²⁰³

108. Ofcom told us that macro-roaming was “technically feasible” and “gives you an immediate improvement in the coverage experienced by consumers... because there is usually someone else who is available”. Whilst they raised the risk it posed to investment, saying that it could inhibit competition and “destroy the incentive to networks to build infrastructure...”,²⁰⁴ they have previously concluded—in their original report on national roaming—that macro not-spot roaming could “potentially save money for one operator in one area and another operator in another area, while decreasing some of the operational challenges. Any aggregate money saved by the operators could be used to fund ‘not-spots’ where there are no operators at all (e.g. in remote areas).”²⁰⁵

197 Oxton & Channelkirk Community Council ([DCS0017](#))

198 [Q381](#)

199 [Q37](#)

200 [Q121](#)

201 Aberdeenshire Council ([DCS0095](#))

202 British Infrastructure Group, [Mobile Coverage: a good call for Britain?](#), 2016

203 Analysys Mason, [Study on the technical issues associated with the introduction of national roaming](#), 2010

204 [Q454](#)

205 Analysys Mason, [Report for Ofcom: Study on the technical issues associated with the introduction of national roaming](#), July 2010

109. We heard from some companies that universal national roaming is not viable because of the impact on the consumer experience and potential disincentive to investment. However, we believe that more work should be done to explore introducing roaming in specific areas which are only serviced by one provider as we believe this has the potential to radically improve coverage in some rural areas of Scotland. *We recommend that Ofcom carry out a feasibility study into macro-level roaming, considering the potential benefits to specific remote areas which are only serviced by one provider and how a scheme could be designed to minimise any disincentives for MNOs to invest in their own network.*

7 Reducing barriers to deployment

110. The telecommunications network is a vital piece of national infrastructure, but it is built and delivered on a local level. Internet and mobile providers told us that regulatory barriers were one of the key challenges to deploying telecommunications infrastructure. We heard that the practical processes required for building, such as gaining planning permission, could cause significant delays to progress. The main areas they identified as causing delays were wayleaves and permitted development right:

- **Wayleaves** are a consent in writing that allow an operator to carry out work on privately-owned land in return for rental payment. We were told that a failure to obtain a signature on a wayleave could bring rollout programmes to a halt.²⁰⁶ The current regime requires companies to get consent from with land owners and providers said this can cause problems when a landlord is difficult to contact—Virgin Media argued for the introduction of a notification regime to reduce the delay caused by absentee landlords.²⁰⁷ The power to introduce such a scheme is reserved to Westminster.

Providers need a wayleave agreement to deploy telecoms apparatus such as cables, which are protected by the Electronics Communications Code (ECC).²⁰⁸ The ECC was reformed in 2017 to make it easier for operators to upgrade infrastructure on public or private land. Providers told us that they largely welcomed the reforms but some, such as TalkTalk, said that the “process remains time-consuming and onerous”.²⁰⁹

- **Permitted development rights** are rights to make certain changes to a building without the need to apply for planning permission. Over the last two years, the UK and Scottish Governments have both brought in changes to legislation which mean that where a site is already used for telecommunications infrastructure, permitted development rights are extended to allow taller ground based masts to be built.²¹⁰ ²¹¹Mobile operators in particular have welcomed these reforms but highlight that more are needed because “the great bulk of 4G and 5G infrastructure being deployed will be small and unobtrusive”. The main issue is the “large numbers” of new installations for extra 4G and 5G capacity, and the impact on “already stretched planning departments”.²¹²

111. DCMS recently established a Barrier Busting Task Force (BBTF) which works with industry, local authorities and the devolved administrations to identify and remove barriers to deployment. As mentioned above, the Electronic Communications Code (ECC), which regulates the relationship between landowners and operators, was revised as part of the Digital Economy Act 2017 to make it easier for operators to upgrade infrastructure on public or private land.

206 [Q232](#)

207 [Q212](#)

208 Ofcom, [Electronic Communications Code: Statement](#), December 2017

209 TalkTalk ([DCS0096](#))

210 House of Commons library briefing, [Permitted Development Rights](#), June 2017

211 The Planner, [PD rights for electronic communications infrastructure to change in Scotland](#), June 2017

212 Mobile UK ([DCS0089](#))

112. Witnesses said that improving practical barriers to deployment is key for the future of the industry: full-fibre and 5G. Mobile providers agreed that it is crucial “to get the regulatory and planning regime for 5G right now”²¹³ so that “the pace of reform reflects the importance people now place on digital connectivity”.²¹⁴ Like the majority of providers we spoke to,²¹⁵ Simon Miller, Three UK, welcomed the UK Government’s recent reforms but expressed disappointment that “these things are only starting to change now.”²¹⁶ Richard Wainer, EE, highlighted that “the mobile industry was operating until the end of last year with an electronic communications code that had not been changed for more than 30 years.”²¹⁷ Paul Morris, Vodafone, argued that it had been difficult to make progress on 4G and 5G whilst operating in “a 2G to 3G regulatory structure.”²¹⁸

113. A recent debate of the UK’s Digital Infrastructure Panel, which included representatives from BT, Hyperoptic and Virgin Media, identified DCMS’ Future Telecoms Infrastructure Review as a way of introducing “more policy consistency and to solve some of the genuine supply-side barriers to build, such as wayleaves.”²¹⁹ Due to be published in summer 2018, the Future Telecoms Infrastructure Review will explore what makes investment in full-fibre and 5G networks attractive across the whole of the UK.

114. In their written evidence, DCMS acknowledged that “scale of infrastructure works required to deploy superfast broadband and mobile networks to geographically dispersed communities, and the consequent funding” are the key barriers to broadband and mobile coverage in Scotland. They highlighted that reforms to the ECC “will make it easier and cheaper for operators to roll out, upgrade and share their apparatus, supporting improved coverage and connectivity across the UK”.²²⁰

Cross-government approach

115. Witnesses told us that a cross-government approach to addressing regulatory barriers across the UK was a priority. The powers for these regulations are split between the UK Government, which legislates for wayleaves and the ECC, and the Scottish Government, which has powers relating to taxation, business rates and some elements of planning.²²¹

116. Daniel Butler, Virgin Media, told us that “about 80% of the cost of putting broadband in the ground... is in the civil engineering effort that entails.” He said that providers “look to local authorities and Governments to do everything within their power to remove some of the costly constraints of highways policy and planning policy and to provide incentives through those frameworks for private rollout.”²²² CityFibre said that a cross-government approach was important so that regulation is “consistent across the UK Government and devolved nations.”²²³

213 [Q376](#) [Paul James]

214 [Q376](#) [Richard Wainer]

215 Vodafone ([DCS0092](#))

216 [Q351](#) [Simon Miller]

217 [Q376](#) [Richard Wainer]

218 [Q376](#) [Paul Morris]

219 IS Preview, [Industry Says UK Gov and Regulation is Key Barrier to Full Fibre Rollout](#), 16 April 2018

220 Department for Culture, Media and Sport, UK Government ([DCS0104](#))

221 [Q211](#)

222 [Q211](#)

223 CityFibre ([DCS0121](#))

117. The Scottish Government told us that they saw the UK Government’s Barrier Busting Task Force as a vehicle for cross-government coordination:

We have had some really good engagement with the barrier busting team in DCMS, which has been positive. We all benefit from sharing best practice examples of where public bodies have worked effectively to remove these barriers.²²⁴

DCMS have stated that the BBTF is “committed to working collaboratively with the Scottish Government.”²²⁵ The Secretary of State commented:

In fact, one of the areas that we need to work with the Scottish Government more on is making sure that the costs of the roll-out are reduced so that street works and wayleaves are sorted out, so that the actual roll-out can go quicker.²²⁶

118. Providers were clear that regulatory and administrative processes are a significant barrier to progress on broadband and mobile coverage. Reducing the complexity and length of these processes is vital to progress on full-fibre and 5G infrastructure. We welcome the UK Government’s reform of the Electronic Communications Code to make the process of deploying technology simpler, and the introduction of the Barrier Busting Task Force as mechanism to bring all parts of government together to address this challenge. However, there is still more to be done and we were struck by the views of providers who told us that until recently they were trying to deliver 4G and 5G technologies within a 2G regulatory structure. *We recommend that both the UK and Scottish Government work together with local authorities to develop a joint approach to addressing regulatory barriers to infrastructure deployment, and set out what progress it is making in response to this Report.*

224 [Q305](#) [Robbie McGhee]

225 Department for Culture, Media and Sport, UK Government ([DCS0104](#))

226 [Q543](#)

Conclusions and recommendations

Broadband coverage and availability

1. Digital connectivity is an essential utility—everyone should have affordable access to a high-quality connection. Scotland’s broadband coverage has improved significantly in recent years, increasing by 20% since 2015 despite its low population density and significant geographical challenges. However, more progress needs to be made, with over 6% of Scottish premises still unable to access superfast broadband, according to the latest figures from ThinkBroadband. In a society that increasingly operates on a “digital-first” basis, we are concerned that a proportion of people in Scotland do not have access to a good quality and reliable broadband service, particularly in rural areas. (Paragraph 10)
2. We were struck by the complexity that some consumers face in determining what broadband speed they should expect and recognise the frustration caused when this is not delivered. We welcome Ofcom’s work to refine how broadband speeds are measured, but believe that it does not go far enough. The consumer’s experience of broadband speed should always be the priority: we believe that all stakeholders have a responsibility to reflect accurately the actual available speed in all communications so that consumers fully understand what speeds they can get. (Paragraph 17)
3. The language used to describe broadband services can be confusing for the consumer. We welcome the steps both Ofcom and the Advertising Standards Authority have taken to improve accuracy in communicating broadband speeds to customers. However, we believe it is misleading to use the phrase “fibre broadband” to describe connections that rely on copper technology which deliver much slower speeds. *We recommend that the ASA revisit their November 2017 ruling that “last mile copper solutions can be referred to as “fibre broadband.”” As more companies offer full-fibre services it is important that customers know exactly what they are paying for.* (Paragraph 18)
4. We welcome the current “right to exit” policy which lets consumers leave contracts without penalty if the service they received is below what they were told they could expect when signing up to a service. However, this right only offers meaningful recourse if there is another provider customers can move to—which simply isn’t the case for many people in more rural areas. *We recommend that Ofcom consult on introducing a right to automatic compensation for consumers in areas that are serviced by only one provider and whose broadband speeds fall below the minimum guaranteed level.* (Paragraph 23)

How broadband is delivered in Scotland

5. During the course of this inquiry, it was clear that there is intense political disagreement between the UK and Scottish Governments about the rollout of broadband in Scotland. We note that the issue of how £21 million was scheduled into procurement processes has led to disharmony between the two Governments, that all parties initially contributed £412 million to this programme and that £600 million is committed to the R100 programme. Whilst there is clearly discord

over the different approaches adopted by both Governments, they are united in wanting to provide broadband coverage to the whole of Scotland. We welcome the acknowledgement from both ministers that the relationship needs to improve and their commitment to building on the collaboration that continues to take place between officials. *We recommend that the UK and Scottish Governments take steps to improve their relationship on broadband delivery and find ways to effectively work together to provide coverage to the whole of Scotland, putting past disagreements behind them.* (Paragraph 32)

Broadband for the “final 5%”

6. The Committee welcomes the actions of both Governments to provide broadband coverage to the “final 5%”. People in rural areas face a much greater challenge in getting connected and this should be reflected in how funding for broadband delivery is allocated. *We recommend that the UK Government increase its current level of investment to reach the last 5%.* (Paragraph 37)
7. Consumers’ data usage is projected to increase by 50% a year and by the point of USO delivery in 2020 we are concerned that its 10Mbps download speed will not meet consumer needs. *We recommend that the UK Government reviews the specification of the USO in the next 6 months, as it has already made provision for in the Digital Economy Act, to ensure the policy is designed to meet the evolving needs of consumers. To keep pace, we recommend that the Government consider increasing the 10Mbps minimum download speed, and specify that this should be the speed consumers receive at all times, including peak periods.* (Paragraph 41)
8. Whilst it appears that most households will be able to be connected with the USO’s £3,400 cost threshold, there remains a risk that consumers in the most remote areas will be excluded, even with the plans for communities to pool demand to reduce costs. *We call on the UK Government to set out in its response to this Report what additional support will be provided for consumers where the cost of connecting their premise is above the USO cost threshold, to ensure those consumers can enjoy the same basic standard of service that is enjoyed by the rest of the UK.* (Paragraph 45)
9. Ensuring communities can effectively come together to pool their demand for broadband connections will be essential to the success of the USO, by reducing the costs of each individual connection and bring more under the threshold. This process of “demand aggregation” must be designed around the consumer to ensure no household misses out on the main deployment of the USO to their community. *We recommend that Ofcom directly consult communities on the design of the aggregation process and require the USO provider to run a comprehensive communications campaign to ensure that all consumers are aware of their right to request a connection.* (Paragraph 46)
10. We welcome the Government’s intention to minimise the cost of the USO for the public by funding it through an industry levy, but are concerned that consumers will end up paying for it indirectly through higher bills. *We recommend that Ofcom monitor the impact of the USO on consumer bills, publishing its findings within one year of the USO launch.* (Paragraph 49)

11. The UK Government's USO and the Scottish Government's R100 programme are different approaches to the same goal: providing broadband coverage to the most remote areas. There will be some areas that could benefit from both the USO and R100 and it is vital that the two programmes work together effectively. *We recommend the two Governments establish a joint USO working group to coordinate activity between the two programmes. One of the first jobs of this group should be to explore the feasibility of combining the on-demand elements of R100 with the USO to ensure that R100 funding does not displace industry funding provided under the USO.* (Paragraph 53)
12. Community broadband providers have played an important role in providing coverage to remote areas of Scotland, which have been under-served by larger providers. We heard that a number of schemes felt they were at risk of being overbuilt by Government-funded interventions. We therefore welcome Ofcom's commitment that they will design the future USO in a way that does not undermine community broadband schemes. (Paragraph 58)

Full-fibre future

13. Whilst there is still progress to be made in providing universal broadband coverage, investment in full-fibre is vital to the UK's economic growth. We welcome UK Government funding for full-fibre investment, particularly through the national rollout of the Gigabit Voucher Scheme. *We recommend that the Gigabit Voucher Scheme works closely with business groups to raise awareness of the available funding and support businesses and communities to create viable bids.* (Paragraph 66)
14. Currently, at least half of the total value in a bid under the Gigabit Voucher Scheme must come from vouchers given to businesses rather than residents. We are concerned that this will be difficult for communities in rural areas to achieve, denying them access to a potential useful source of funding. *The UK Government should consider dropping this requirement for bids in rural areas of Scotland, which will allow more communities to take advantage of the scheme.* (Paragraph 67)
15. Competition is fundamental to driving innovation, investment in infrastructure, and customer choice. Therefore, we welcome Ofcom's action to stimulate retail competition by cutting the prices Openreach can charge providers. This is clearly designed to encourage investment in full-fibre, however we heard from some providers who argued that it may not have this effect and could hinder full-fibre investment by companies other than Openreach. *We recommend that Ofcom carefully monitors the impact of the price cap on full-fibre investment and revisits the affect of the price cap on Openreach's superfast broadband service if necessary.* (Paragraph 75)
16. We also welcome Ofcom's measures to stimulate infrastructure-based competition. However, previous efforts to encourage greater use of Openreach's ducts and poles for other companies to lay their own networks have had limited success. *We recommend that Ofcom monitor the uptake of Openreach's ducts and poles. If this reform does not lead to a substantial increase, Ofcom should revisit the issue next year to see what other action could be taken to encourage this form of competition.* (Paragraph 78)

Mobile coverage

17. We recognise the huge improvement to Scotland’s mobile coverage in recent months, particularly considering its challenging geography. However, the ambition must be to achieve universal access to mobile coverage—communities in remote and rural areas must not be forgotten. (Paragraph 84)
18. We welcome the fact that Ofcom is consulting on the introduction of nation-specific coverage obligations for the next spectrum auction. We believe this will help ensure that Scotland’s challenging rural geography does not lead to its mobile coverage falling behind the rest of the UK, *and recommend they are included in the next spectrum auction in at least as extensive terms as set out in Ofcom’s consultation.* (Paragraph 90)
19. However, even if these obligations are introduced there will still be some areas without coverage. We have heard that there is a particular issue with the quality of signal on Scotland’s A and B roads, which is important both for communication “on-the-move” and safety because large stretches of Scotland’s roads are in extremely remote locations. *We recommend that Ofcom monitor the impact of its geographical coverage targets on mobile coverage on Scotland’s roads. If there is insufficient progress, Ofcom should consult on including specific targets for road coverage in future spectrum auctions.* (Paragraph 91)
20. The ESN network presents an invaluable opportunity for operators to improve coverage in rural areas, and has the potential to create competition in areas which have been poorly served previously. To achieve this, EE need to ensure they facilitate and encourage site-sharing in their building plans. *We are concerned that there has been such little interest from other operators in sharing the sites so far. Ofcom should carefully monitor provider take-up of ESN site-sharing, and require EE to provide an update in early 2019. If take-up is still low, Ofcom should consider intervening to regulate the wholesale access price for ESN mast sites.* (Paragraph 100)
21. We heard from some companies that universal national roaming is not viable because of the impact on the consumer experience and potential disincentive to investment. However, we believe that more work should be done to explore introducing roaming in specific areas which are only serviced by one provider as we believe this has the potential to radically improve coverage in some rural areas of Scotland. *We recommend that Ofcom carry out a feasibility study into macro-level roaming, considering the potential benefits to specific remote areas which are only serviced by one provider and how a scheme could be designed to minimise any disincentives for MNOs to invest in their own network.* (Paragraph 109)

Reducing barriers to deployment

22. Providers were clear that regulatory and administrative processes are a significant barrier to progress on broadband and mobile coverage. Reducing the complexity and length of these processes is vital to progress on full-fibre and 5G infrastructure. We welcome the UK Government’s reform of the Electronic Communications Code to make the process of deploying technology simpler, and the introduction of the Barrier Busting Task Force as mechanism to bring all parts of government together

to address this challenge. However, there is still more to be done and we were struck by the views of providers who told us that until recently they were trying to deliver 4G and 5G technologies within a 2G regulatory structure. *We recommend that both the UK and Scottish Government work together with local authorities to develop a joint approach to addressing regulatory barriers to infrastructure deployment, and set out what progress it is making in response to this Report.* (Paragraph 118)

Formal minutes

Wednesday 18 July 2018

Members present:

Pete Wishart, in the Chair

| | |
|-------------------|----------------|
| Deidre Brock | Ged Killen |
| David Duguid | John Lamont |
| Hugh Gaffney | Tommy Sheppard |
| Christine Jardine | Ross Thomson |

Draft Report (*Digital Connectivity in Scotland*), proposed by the Chair, brought up and read.

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

Paragraphs 1 to 118 read and agreed to.

Resolved, That the Report be the 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).

[Adjourned till Wednesday 5 September at 10.00 a.m.]

Witnesses

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

Tuesday 23 January 2018

Question number

Andrew Ferguson, Editor-in-Chief and Software Developer, ThinkBroadband, **Brendan Gill**, Chief Executive, OpenSignal and **Pete Moorey**, Director of Advocacy and Public Affairs, Which? [Q1–39](#)

Professor Will Stewart, Optoelectronics Research Centre, University of Southampton and Chair of the Institution of Engineering and Technology's Communications Policy Panel, **Ewan Sutherland**, Independent Telecommunications Policy Analyst, and **Professor Rahim Tafazolli**, Director of Institute for Communication Systems and the 5G Innovation Centre at the University of Surrey [Q40–76](#)

Dr Gary Bosworth, Head of the Rural Research Group and Deputy Head of the School of Geography, University of Lincoln, **Dr Lorna Philip**, Senior Lecturer, Geography and Environment, and Deputy Head of School of Geosciences, University of Aberdeen, and **Professor Sarah Skerratt**, Professor of Rural Society and Policy, Fellow of the Royal Society of Arts, and Director, Rural Policy Centre, Scotland's Rural College [Q77–103](#)

Monday 5 February 2018

Amanda Burgauer, Chair, Scottish Rural Action, **Callum Hay**, Acting Chairperson, Borders Community Broadband, and **Alison Macleod**, Local Development Officer, Applecross Community Company [Q104–127](#)

Robert Emmott, Director of Finance at Comhairle nan Eilean Siar and Member of the Infrastructure Action Plan Portfolio Board, **Simon Haston**, Head of IT, Aberdeen City Council, and **Councillor Steven Heddle**, Chair, Environment and Economy Board, COSLA [Q128–157](#)

Hugh Aitken, Former Regional Director, CBI Scotland, **Stuart Mackinnon**, External Affairs Manager—Scotland, Federation of Small Businesses, and **Charandeep Singh**, Head of External Relations, Scottish Chambers of Commerce [Q158–182](#)

Tuesday 6 March 2018

Brendan Dick, Director, BT Scotland, **Kim Mears**, Managing Director, Strategic Infrastructure Development, Openreach, **Iain Wood**, Director of Corporate Affairs and Regulation, TalkTalk, and **Daniel Butler**, Head of Public Affairs and Policy, Virgin Media [Q183–228](#)

Malcolm Corbett, Chief Executive, Independent Networks Cooperative Association, **James McClafferty**, Head of Regional Development, CityFibre, **Floyd Widener**, Chief Sales Officer, Hyperoptic, and **Michael Armitage**, Chair, Broadway Partners [Q229–253](#)

Tuesday 17 April 2018

Fergus Ewing MSP, Cabinet Secretary for the Rural Economy and Connectivity, **Sara Budge**, Programme Director, Digital Scotland Superfast Broadband, **Clive Downing**, Programme Director, Reaching 100%, and **Robbie McGhee**, Head of Digital Connectivity Policy, Scottish Government

[Q254–319](#)

Tuesday 24 April 2018

Dr Marwan Fayed, Director, High-Speed Universal Broadband Services, and Senior Lecturer, School of Computer Science, University of St Andrews

[Q320–343](#)

Paul James, Head of Public Affairs, O2, **Simon Miller**, Deputy Head of Public Affairs, Three UK, **Paul Morris**, UK Head of Government Affairs, Vodafone, and **Richard Wainer**, Head of Public Affairs, EE

[Q344–394](#)

Tuesday 1 May 2018

Steve Unger, Chief Technology Officer, Ofcom, and **Jonathan Ruff**, Regulatory Affairs Manager, Ofcom Scotland

[Q395–461](#)

Rt Hon Matt Hancock MP, Secretary of State for Digital, Culture, Media and Sport

[Q462–555](#)

Published written evidence

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

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

- 1 Aberdeen City Council ([DCS0058](#))
- 2 Aberdeenshire Council ([DCS0095](#))
- 3 Applecross Community Company ([DCS0087](#))
- 4 Ardgay & District Community Council ([DCS0055](#))
- 5 Ardross Community Council ([DCS0080](#))
- 6 BT ([DCS0065](#))
- 7 BT ([DCS0108](#))
- 8 Balquhidder Community Broadband ([DCS0090](#))
- 9 Borders Community Broadband ([DCS0028](#))
- 10 Borgue Community Council ([DCS0029](#))
- 11 Borthwick Water Community Development Trust ([DCS0040](#))
- 12 Bower Community Council ([DCS0086](#))
- 13 Boyce, Nick and Jane ([DCS0039](#))
- 14 Broadway Partners ([DCS0078](#))
- 15 Butler, Mrs Louise ([DCS0036](#))
- 16 Campbell Stewart MacLennan & Co ([DCS0076](#))
- 17 Carron Valley & District Community Council ([DCS0071](#))
- 18 Cartwright, Mary E.L. ([DCS0102](#))
- 19 Castletown & District Community Council ([DCS0084](#))
- 20 Cisco Systems ([DCS0074](#))
- 21 Citizens Advice Scotland ([DCS0112](#))
- 22 CityFibre ([DCS0121](#))
- 23 Comhairle nan Eilean Siar ([DCS0079](#))
- 24 Conon Bridge Community Council ([DCS0046](#))
- 25 Corner, Professor George ([DCS0011](#))
- 26 Cornish, Mr Bob ([DCS0047](#))
- 27 Coruisk House Limited ([DCS0031](#))
- 28 Cove & Cockburnspath Community Council ([DCS0053](#))
- 29 Department for Culture, Media and Sport, UK Government ([DCS0104](#))
- 30 EE ([DCS0117](#))
- 31 Easter Kinkell Group ([DCS0023](#))
- 32 Eden Brook Farm & Partners ([DCS0060](#))
- 33 Ettrick and Yarrow Community Council ([DCS0064](#))

- 34 Ewan, Sutherland ([DCS0109](#))
- 35 FSB ([DCS0052](#))
- 36 Fear, Dr Jonathan ([DCS0006](#))
- 37 Floors, Makerstoun, Smailholm and Nenthorn Community Council ([DCS0030](#))
- 38 Ford, Mr Tim ([DCS0008](#))
- 39 Foyers, Mr Iain ([DCS0016](#))
- 40 Fraser, Mr William ([DCS0045](#))
- 41 Friell, Bill ([DCS0034](#))
- 42 Friell, Bill ([DCS0091](#))
- 43 Friell, Daniele ([DCS0041](#))
- 44 Gallagher, Moira ([DCS0100](#))
- 45 Galley, Cordelia ([DCS0075](#))
- 46 Gavinton, Fogo and Polwarth Community Council ([DCS0012](#))
- 47 Glendinning, Mrs Therese ([DCS0025](#))
- 48 Gordon and Westruther Community Council ([DCS0049](#))
- 49 Harris, Lorna ([DCS0035](#))
- 50 Heriot Community Broadband ([DCS0063](#))
- 51 High Speed Universal Broadband Services ([DCS0113](#))
- 52 High-Speed Universal Broadband Services CIC ([DCS0066](#))
- 53 Highland Council ([DCS0103](#))
- 54 Holder Marine Services Ltd ([DCS0024](#))
- 55 Houndridge Resident's Group ([DCS0013](#))
- 56 Hunter, Robert ([DCS0077](#))
- 57 Inspired By Technology Ltd ([DCS0054](#))
- 58 Jacob, Mr Michael ([DCS0001](#))
- 59 Jed Valley Community Council ([DCS0048](#))
- 60 Killearn Community Council (KCC) & Killearn Broadband Group (KBG) ([DCS0057](#))
- 61 Lammermuir Community Council ([DCS0051](#))
- 62 Law Society of Scotland ([DCS0068](#))
- 63 Lewis, Ms Lindsay ([DCS0070](#))
- 64 Lochalsh Community Council ([DCS0043](#))
- 65 Lothian Broadband ([DCS0107](#))
- 66 Lothian Broadband Networks Limited ([DCS0073](#))
- 67 Mitchell, Mr Christopher ([DCS0044](#))
- 68 Mobile UK ([DCS0089](#))
- 69 Nenthorn Residents ([DCS0032](#))
- 70 Newcastleton & District Community Trust ([DCS0014](#))
- 71 North Skye Broadband ([DCS0067](#))

- 72 North Skye Broadband ([DCS0082](#))
- 73 Ofcom ([DCS0083](#))
- 74 Ofcom ([DCS0119](#))
- 75 Openreach ([DCS0098](#))
- 76 Openreach ([DCS0110](#))
- 77 Ormiston, Grace ([DCS0022](#))
- 78 Oxton & Channelkirk Community Council ([DCS0017](#))
- 79 Pamula, Rev Stanislaw ([DCS0088](#))
- 80 Prain, Mr Iain ([DCS0059](#))
- 81 Reed, Ms Sandie ([DCS0042](#))
- 82 Ross, Mr Tony ([DCS0026](#))
- 83 Scotland's Rural College ([DCS0111](#))
- 84 Scott, Mr William ([DCS0105](#))
- 85 Scottish Chambers of Commerce ([DCS0097](#))
- 86 Scottish Government ([DCS0081](#))
- 87 Scottish Government ([DCS0120](#))
- 88 Scottish Rural Action ([DCS0056](#))
- 89 Semler, Geoff ([DCS0033](#))
- 90 SkyeConnect Ltd ([DCS0061](#))
- 91 SmartRural.coop ([DCS0037](#))
- 92 Smith, Caroline ([DCS0009](#))
- 93 Smith, Mr Stuart ([DCS0004](#))
- 94 Southdean Community Council ([DCS0005](#))
- 95 Strang Steel, C.B. ([DCS0101](#))
- 96 Strathard Community Council ([DCS0002](#))
- 97 Strickland, Mr Alan ([DCS0072](#))
- 98 Strickland, Mr Christopher ([DCS0007](#))
- 99 Sutherland, Ewan ([DCS0019](#))
- 100 TalkTalk ([DCS0096](#))
- 101 Telfer, Brian ([DCS0015](#))
- 102 thinkbroadband.com ([DCS0010](#))
- 103 Three ([DCS0114](#))
- 104 Townsend, Mr Alfred ([DCS0003](#))
- 105 University of Lincoln ([DCS0021](#))
- 106 Virgin Media ([DCS0093](#))
- 107 Vodafone ([DCS0092](#))
- 108 Vodafone ([DCS0115](#))
- 109 Which? ([DCS0094](#))

- 110 Which? ([DCS0116](#))
- 111 Wildi, Mr Leo ([DCS0027](#))
- 112 Wright, Betty ([DCS0018](#))

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. The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

Session 2017–19

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|-----------------------|---|---------------------|
| First Report | European Union (Withdrawal) Bill: Implications for devolution | HC 375 |
| Second Report | The future of working practices in Scotland | HC 449 (HC 1067) |
| Third Report | Royal Bank of Scotland branch closures | HC 682 |
| Fourth Report | Immigration and Scotland | HC 488 |
| First Special Report | Jobcentre Plus closures in Scotland: Government Response to the Committee's Third Report of Session 2016–17 | HC 432 |
| Second Special Report | The future of working practices in Scotland: Government Response to the Committee's Second Report | HC 1067 |