

2. Executive summary

- 2.1 This report outlines the main developments in coverage and performance of fixed broadband and mobile networks, as well as network security and resilience. Alongside this report, we have published reports summarising the findings for the four UK nations. We have also updated our mobile coverage checker app for smartphones and tablets, and our online visualisation tool, to help people find out more about the availability of fixed broadband and mobile services.
- 2.2 Since we published our first report on these services in 2011, coverage has grown and people and businesses are better connected. But in too many areas coverage is still poor, broadband speeds are slow, and mobile services are unreliable or not available. Ofcom's Strategic Review of Digital Communications led to a number of policies⁴ aimed at addressing these problems; our Connected Nations reports help us to monitor progress.

Fixed broadband

- 2.3 **Broadband coverage to people's homes and businesses has continued to improve.** Superfast broadband – which Ofcom defines as providing a minimum 30Mbit/s download speed – is now available to 91% of premises in the UK, up from 89% last year. Coverage of broadband with a minimum of 24Mbit/s download speed, the Government's definition of superfast broadband, was 92% of premises as of May 2017⁵.
- 2.4 **But too many premises lack access to decent broadband.** We estimate that around 1.1 million UK premises (4%) cannot access decent broadband⁶; that means a connection capable of delivering a download speed of at least 10Mbit/s and an upload speed of at least 1Mbit/s. This is the specification for the Government's proposed broadband Universal Service Obligation (USO). The inclusion of a minimum upload speed reflects the growing importance to people and businesses of services such as videoconferencing and video sharing, which need good upload, as well as download, speeds.
- 2.5 **Lack of decent broadband is a particular concern for small businesses.** Small businesses increasingly rely on broadband, but a disproportionate number cannot access even a basic service. We estimate that almost 230,000 small businesses (7%) cannot receive decent broadband. A key benefit of the USO will be to address this concern. We see a similar pattern for superfast broadband, where around 500,000 small businesses (16%) do not have access, compared to 9% of premises as a whole.

⁴ <https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/policy/digital-comms-review/conclusions-strategic-review-digital-Communications>

⁵ These statistics for coverage of services with download speeds of 30Mbit/s and 24Mbit/s both relate to May 2017, which is when our fixed coverage data was gathered. Throughout the remainder of this document we use our definition of superfast (i.e. with a download speed of at least 30Mbit/s) unless otherwise stated.

⁶ We consider that this is the minimum level of broadband performance required for internet access to services such as web browsing, email and certain video services.

Figure 1: An indication of what you can do with different download speeds

	Download speed			
	10Mbit/s	30Mbit/s	300Mbit/s	1Gbit/s
Streaming music	Yes	Yes	Yes	Yes
Downloading an album	1 – 2 min.	30 – 60 sec.	< 10 sec.	< 5 sec.
Streaming an HD movie	Yes	Yes	Yes	Yes
Downloading an HD movie	1 – 1½ hours	30 min.	< 5 min.	< 2 min.
Streaming an ultra HD movie	No	Yes	Yes	Yes
Downloading an ultra HD movie	5 hours	1½ - 2 hours	<15 min.	< 5 min.

Estimates assume exclusive use of the broadband connection. If others are using the connection at the same time, content may take longer to download or may stream at a lower quality.

Source: Ofcom analysis

2.6 **The picture varies across the nations.** Generally, premises in England have better access to broadband than those in Scotland, Wales and Northern Ireland. While superfast broadband coverage in England is 92%, the equivalent figure for the other nations varies between 85% and 89%. Similarly, 3% of premises in England do not have access to decent broadband, while the equivalent figure for the other nations varies between 5% and 7%.

2.7 **More people are upgrading to superfast services.** As superfast broadband coverage reaches 91%, almost four in ten premises (38%) now take a superfast service. This has increased from 31% last year. As a result, the total amount of data carried by UK fixed access networks in a month has increased by 52% over the last year, to 4.17 exabytes⁷.

2.8 **'Full fibre' investment is starting to happen.** Full fibre broadband delivers a predictable and reliable service, with speeds as high as one gigabit per second. It is now available to 840,000 UK premises (around 3%, up from 2% last year). We expect this to increase in the coming years, as a number of network operators have recently announced plans to extend their full fibre networks:

- a) Virgin Media is extending its ultrafast broadband network to an additional four million premises, of which two million are expected to be full fibre⁸;
- b) City Fibre, in partnership with Vodafone, recently announced plans to roll out full fibre to five million premises by 2025⁹. Hyperoptic has also announced plans to provide full fibre coverage to five million premises by 2025¹⁰. Gigaclear, targeting more rural areas,

⁷ 1 exabyte = 1 billion gigabytes = 1 quintillion bytes

⁸ <http://www.libertyglobal.com/pdf/press-release/Virgin-Media-Fixed-Income-Q3-2016-FINAL.pdf>

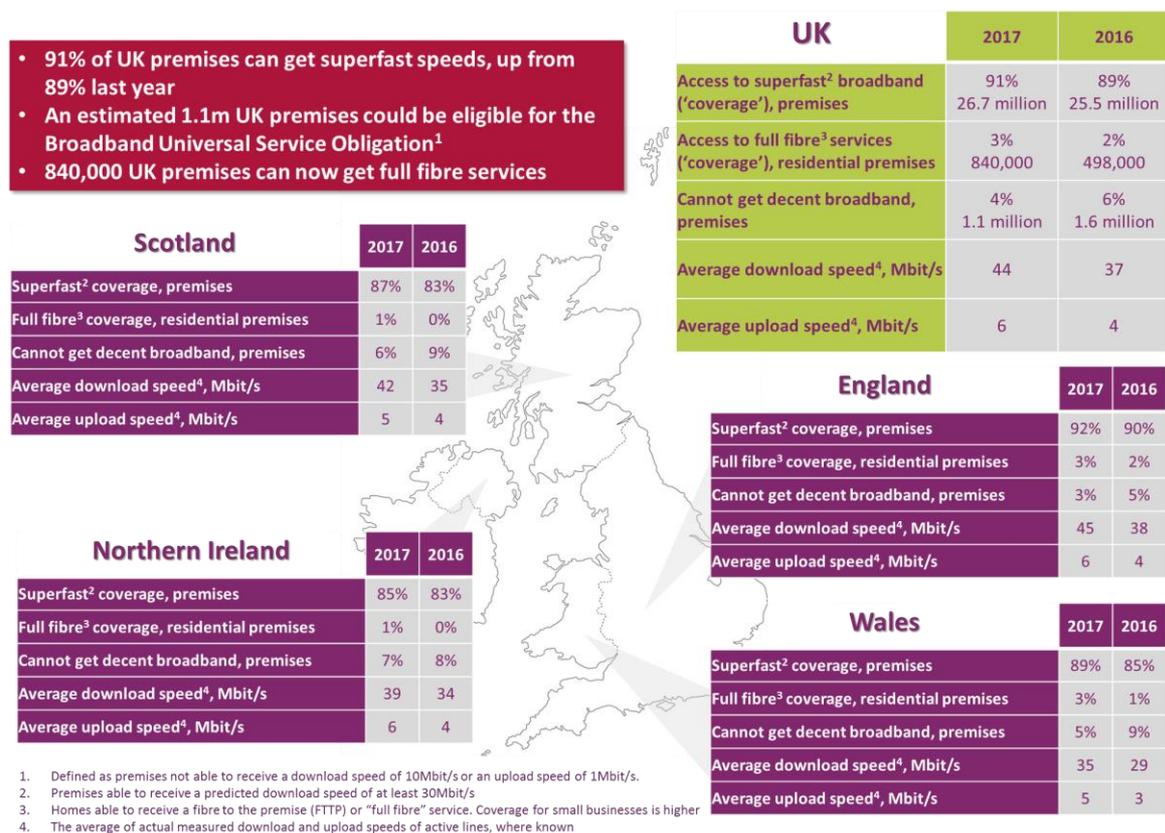
⁹ <https://www.cityfibre.com/news/vodafone-cityfibre-bring-gigabit-speed-fibre-uk/>

¹⁰ <https://www.hyperoptic.com/press/posts/hyperoptic-secures-100million-to-accelerate-full-fibre-rollout/>

aims to cover 150,000 premises by 2020¹¹. KCOM has also announced it plans to have full fibre coverage across all of its network area by March 2019, providing coverage to 200,000 premises¹²; and

- c) Openreach has outlined its ambition to roll out full fibre services to two million premises by the end of 2020¹³, and indicated that it may be possible to extend this to 10 million premises by the mid-2020s¹⁴.

Figure 2: The state of fixed broadband across the UK



Source: Ofcom analysis of operator data, May-June 2017

Mobile telephones and broadband

2.9 **We are making sure that the way we measure mobile coverage reflects the actual experience of today's mobile users.** Our expectation of mobile services is changing as we become more dependent on mobile services and need to access them wherever we are – indoors, outdoors or on the move. At the same time the devices we use to access mobile services have changed, with increasing take-up of smartphones and tablets, which require

¹¹ <https://www.ispreview.co.uk/index.php/2017/05/gigaclear-raise-111m-1gbps-rural-broadband-150000-uk-premises.html>

¹² <https://www.kcomhome.com/news/articles/kcom-full-steam-ahead-for-fibre-broadband/>

¹³ <http://www.btplc.com/Sharesandperformance/Quarterlyresults/Investormetingpack.pdf>

¹⁴ <https://www.homeandbusiness.openreach.co.uk/news/industry-has-welcomed-our-ambition-to-build-a-large-scale-ftp-broadband-network>

stronger signals than older, simpler phones. Our engineers have therefore carried out an extensive programme of practical tests to ensure mobile coverage information reflects the actual experience of today's mobile users.

- 2.10 The Government and the National Infrastructure Commission (NIC) have supported this approach, asking Ofcom to set out how reporting of mobile coverage might reflect the quality of service experienced by consumers^{15 16}.
- 2.11 We define mobile coverage in a way that is likely to deliver a decent experience to smartphone users:
- a) **Telephone calls:** Nearly all 90-second telephone calls should be completed without interruption;
 - b) **Data services:** Nearly all connections should deliver a speed of at least 2Mbit/s. This is fast enough to allow users to browse the internet and watch glitch-free mobile video.
- 2.12 We have used crowdsourced¹⁷ data from consumer handsets to identify the signal levels needed to meet these targets at least 95% of the time. We have also checked the signal levels predicted to be available from mobile operators are provided in practice.
- 2.13 The headline findings on the state of coverage of the UK's mobile networks in 2017 are:
- a) **Most, but not all, people have coverage in their home or at their offices:** 90% of UK premises have indoor telephone call coverage from all four mobile networks, while 85% have indoor coverage for mobile data services. These figures are up from 85% and 80% respectively last year. Our coverage figures take into account the reduction of mobile signal levels indoors because signals can struggle to travel through walls. However, those people who do not have indoor coverage may still be able to access mobile data over wifi, and are increasingly able to make telephone calls over wifi¹⁸;
 - b) **Coverage away from home has improved, but is still poor:** 70% of the geographic area of the UK has telephone call coverage from all four networks, while 63% has mobile data coverage. These figures are up from 63% and 52% respectively last year;
 - c) **Coverage on roads also needs to improve.** It is possible to make a telephone call from all four networks while inside a vehicle on just 68% of A and B roads, while 58% of A and B roads have in-vehicle data coverage. These figures are up from 56% and 45% respectively last year. Our coverage figures take into account the reduction of mobile signal levels as they travel through the metal frame of a typical vehicle. Motorists increasingly rely on mobile connectivity for a wide range of services, from entertainment to navigation, and we expect this reliance to increase as 'connected cars' become more popular;

¹⁵ <https://www.gov.uk/government/publications/next-generation-mobile-technologies-a-5g-strategy-for-the-uk>

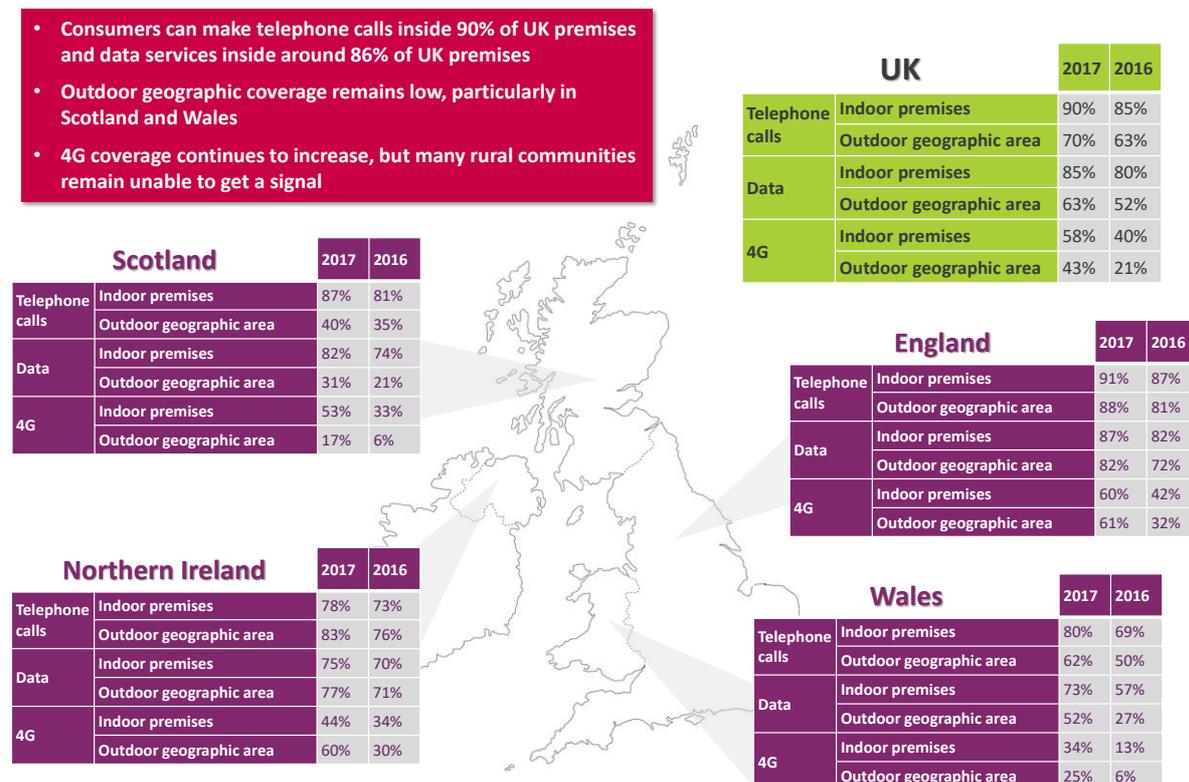
¹⁶ <https://www.gov.uk/government/publications/connected-future>

¹⁷ Crowdsourcing is the use of data from a large number of people and, in this particular case, their mobile phones. This data is automatically collected and made available for analysis.

¹⁸ Wifi calling is now supported by many mobile phones and we expect its use to continue to grow.

- d) **Urban areas have better coverage than rural; England has better coverage than the other nations.** While people inside 90% of UK premises can now make telephone calls on all four mobile networks, this falls to 57% in rural areas. People can make outdoor telephone calls from 70% of the geographic area of the UK, but only 40% of the geographic area of Scotland.

Figure 3: The state of mobile services across the UK



Coverage is for all operators, i.e. the percentage of premises or geographic area where there is likely to be a signal from all operators. Coverage levels for individual operators will be higher. **Based on Ofcom coverage definitions, which are different to those used in coverage obligations.**

Source: *Ofcom analysis of operator data, June 2017*

2.14 **We are working with industry to ensure that coverage measurement reflects the consumer experience.** We recently established a cross-industry working group to agree a consistent means of measuring coverage, building on and refining the principles set out here. We expect this to require further testing, using both traditional test equipment and crowdsourcing. The working group will consider how this can best be presented to consumers, so that they can choose the service that best meets their needs. We will continue to seek ways to improve both how we measure coverage and how we present information via our own coverage checker app for tablets and smartphones¹⁹.

2.15 **Coverage obligations are the main means by which we can improve mobile coverage.** We can improve mobile coverage by applying coverage obligations to the spectrum licences held by operators. There are currently two such obligations. One requires operators to

¹⁹ <https://www.ofcom.org.uk/phones-telecoms-and-internet/advice-for-consumers/advice/ofcom-checker>

provide coverage for telephone calls to 90% of UK landmass; the other requires O2 to deliver an indoor data service of at least 2Mbit/s to 98% of UK premises. Both of these obligations require delivery by the end of 2017, and early in 2018 we will be examining whether they have been complied with.

- 2.16 **Historic coverage obligations do not fully meet the needs of modern mobile users.** When these coverage obligations were established they adopted the approach to measurement that had historically been used by the mobile industry. Since then, increased consumer expectations and changes in the devices used to access mobile services mean the levels of coverage actually achieved will be lower - by approximately 10 percentage points. Based on how we now measure coverage to reflect modern smartphone use, and assuming the operators meet their obligations, the historic coverage obligations would in practice mean that all operators would provide outdoor coverage to 80% of the UK landmass (rather than 90%), and O2 would deliver an indoor data service to 88% of UK premises (rather than 98%).
- 2.17 **We are considering new coverage obligations associated with the 700 MHz spectrum auction.** As set out in our Strategic Review of Digital Communications²⁰, the award of the mobile airwaves in the 700 MHz band provides an important opportunity to improve coverage. We intend to define these new obligations in a way that reflects the actual experience of today's mobile users. We also believe that they should focus on rural areas, where the current experience is poorest and is least likely to be addressed by operators' commercial deployments. We are planning to consult early in 2018 on specific proposals.
- 2.18 **Increasing coverage and take-up of 4G is driving data use.** The average volume of data consumed per subscriber per month is now 1.9GB, up from 1.3GB last year – an increase of 46% year on year. A total of 156PB was sent over all mobile networks in June 2017, a 47% increase on the year before. Even so, this represents less than 4% of the total volume of data sent over fixed broadband networks in a month.

Network security and resilience

- 2.19 Communications providers must protect the availability and resilience of their networks. We require operators to report major incidents to us and received 678 incident reports last year, broadly in line with previous years. We also require operators to demonstrate that they adopt security best practice.
- 2.20 **Cyber security is a major area of current focus.** Historically most network failures have been due to physical faults, for example hardware failures. In the light of the growing threat of cyber attack, we are working with the Department for Digital, Culture, Media & Sport (DCMS) and the National Cyber Security Centre (NCSC) on a programme to proactively test operators' cyber-readiness.

²⁰ <https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/policy/digital-comms-review/conclusions-strategic-review-digital-Communications>