Ofcom
making communications work
for everyone

Connected Nations 2018

England report

18 December 2018

Overview

People now rely on being connected through calls and online services more than ever, whether at home or on the move. So, it's important that they have access to reliable, good quality broadband and mobile connections, to help them keep in touch with friends and family, shop and pay bills online, or stream the latest must-see TV series.

Companies, government and local communities have continued to invest in connectivity, meaning many people have a choice of communications providers in England.

However, people's experience varies significantly by both their region and how rurally they live, work and travel. This report provides a broad overview for England, which has the highest population of any UK nation. More detail on the local picture, including by local authority and constituency is available through interactive and open data on Ofcom's website.[1]

Key findings

The latest Connected Nations Report for England shows:

- **Access to superfast broadband services continues to increase.** Superfast broadband coverage is now at 94% - up from 92% in 2017. In rural areas, 76% of homes and businesses have access to high speed services. 1.5 million premises (6%) now have access to full fibre services.
- **Around half of homes in England could get faster broadband than they do now**.
- **However, 484,000 homes are still unable to access a decent broadband speed.** Whilst this has dropped by over 306,000 since 2017, 2% of homes and businesses in England still can't access a service delivering 10 Mbit/s download and 1 Mbit/s upload speed. The majority of these remaining homes (around 322,000) are in rural areas. 11% of rural premises in England cannot access a decent broadband speed.
- **82% of England's landmass has good 4G coverage from all four mobile operators. Voice services from all operators cover 91% of England's landmass.** Individual operator coverage for 4G is higher, at between 89% and 95% of England's landmass. **78% of homes and businesses have good indoor 4G coverage from all four operators.** However the experience isn't the same across England - only 42% of properties in rural areas have good 4G coverage from all four mobile operators.

[1] https://www.ofcom.org.uk/research-and-data/multi-sector-research/infrastructure-research/connected-nations-2018/interactive-report
https://www.ofcom.org.uk/research-and-data/multi-sector-research/infrastructure-research/connected-nations-2018/data-downloads

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Background

Ofcom now publish a report annually on the state of the electronic communications networks and services in the UK, with two additional short "update" reports over the course of the year focused on availability.

Our data sources and methodologies are available on our website.[2]

Reporting on England

With 55 million people in England, it is diverse socially, economically and geographically. This report only provides a broad overview. Connectivity in England can often look better than the UK. Yet the statistics can mask significant differences between London and other regions, and the stark gap between rural and urban areas.

Making more and better information available

Alongside this report and our in-depth UK report, we are publishing an interactive dashboard, giving readers the opportunity to drill into the data at the level and locations they are most interested in.[3]

Building on our existing open data, we are now making it even easier for people and businesses to access our data on fixed broadband and mobile coverage availability. We are releasing two APIs, a standardised way of sharing data between different systems. [4]These will allow others to use our data creatively to develop services, such as apps that will benefit people and business.

In parallel we are also launching the *Boost your broadband* campaign to help people identify the fixed broadband services available to them and get better value from their broadband deal.

Despite superfast broadband being available to more than nine in ten premises in England and momentum building behind full-fibre broadband, our data shows that people are often not on the fastest service in their area. Around half of homes in England could get faster broadband than they do.

We are encouraging people to check what broadband they need, what's available in their area and to engage with their provider or shop around to make sure they are on the best possible deal.

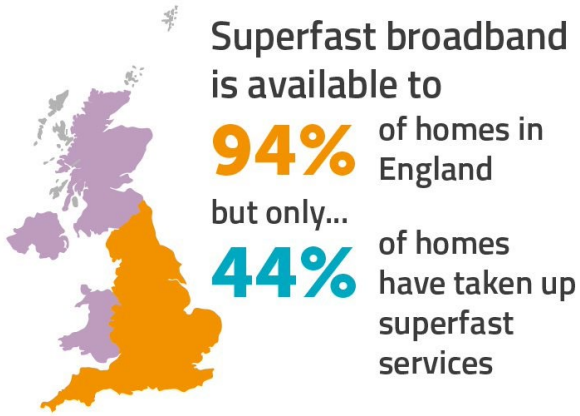
[2] https://www.ofcom.org.uk/research-and-data/multi-sector-research/infrastructure-research/connected-nations-2018/methodology
[3] https://www.ofcom.org.uk/research-and-data/multi-sector-research/infrastructure-research/connected-nations-2018/interactive-report
[4] Application Programming Interface

Fixed broadband services in England

Fixed broadband scorecard for 2018

Coverage of broadband (% of premises):	England	UK
USO specification (>=10Mbit/s upload and 1Mbit/s download)	98%	98%
Superfast broadband coverage (>=30Mbit/s)	94%	94%
Urban	97%	97%
Rural	76%	74%
Ultrafast broadband (>=300Mbit/s)	52%	50%
Full fibre coverage	6%	6%
Average broadband speeds and data use		
Average download speed	50Mbit/s	49Mbit/s
Urban	52Mbit/s	51Mbit/s
Rural	34Mbit/s	32Mbit/s
Average upload speed	7Mbit/s	7Mbit/s
Data use (monthly average) [5] [6]	241GB	240GB
Urban	250GB	251GB
Rural	176GB	177GB

Source: Ofcom analysis of operator data



Key findings

Superfast broadband is available to 94% of homes and businesses in England (up from 92% in 2017). Access in rural areas is much lower at 76%.

Only 44% of homes and businesses have taken up services that deliver superfast speeds.

The number of premises that still don't have access to a decent broadband service in

[5] UK figures for data usage include some records not matched to an address. The effect of these is to lower the average figure for the UK.

[6] Data usage in urban and rural areas of England is slightly higher than the UK averages. However, the overall average data use in England is slightly lower than the UK average. This difference is due to relative weighting and usage patterns across the nations.

England is 484,000. Around 322,000 of these are in rural areas.

1.5 million premises (6%) in England have a full fibre service available.

In 2018, the average download speed in England was 50Mbit/s and upload speeds 7Mbit/s. In rural areas the amount of data used each month (download and upload) has increased by over 40GB in the past year to 176GB. This remains much lower than urban areas, where the average data use is 250GB.

Fast, reliable broadband is crucial for small businesses. 91% of Small and Medium Enterprises' (SME) premises now have access to at least superfast services. Access in rural areas remains lower at 67%, a 7-percentage point increase from 2017.

Ofcom is supporting investment in ultrafast broadband, more reliable fibre networks but also taking action to ensure that those who cannot currently get a decent connection are able to legally request one to be installed.

Government targets and interventions

In our spring update of the Connected Nations, we reported that the UK Government met its target of 95% UK coverage of broadband with a download speed of at least 24 Mbit/s.[7] Having met its target, the Government's Broadband Delivery UK (BDUK) programme has continued to fund superfast roll out beyond this.

In July 2018 the Government set out its ambition in the Future Telecoms Infrastructure Review (FTIR) for 15 million premises to be connected to full fibre services by 2025 and nationwide coverage by 2033.

Despite the increased availability of superfast broadband and mobile services, challenges remain. Availability of these services, not just in England but right across the UK, is lower in rural areas.

This is because of the increased costs of deploying communications infrastructure to serve areas where there are few customers or where the costs of building infrastructure are higher.

In its 2018 budget, the UK Government has allocated £200m to pilot innovative approaches to deploying fibre in rural locations.

Fixed broadband coverage

Ofcom defines superfast broadband as a service which delivers a minimum download speed of at least 30 Mbit/s.

A major challenge to the roll out of fixed superfast broadband services is the longer line lengths in more rural parts of the UK - the distance between the premise and the nearest fibre enabled cabinet or exchange.

These distances cause serious deterioration of the broadband signal, resulting in slower data speeds.

Figure 1: Coverage of superfast broadband (≥30Mbit/s), urban / rural breakdown

	2018	2017
England	94%	92%
England urban	97%	95%
England rural	76%	69%

Source: Ofcom analysis of operator data

[7] https://www.ofcom.org.uk/research-and-data/multi-sector-research/infrastructure-research/connected-nations-update-spring-2018

94% of premises have access to superfast speeds, however only around half of customers are taking up these services. In rural England, three quarters of homes and businesses had access to superfast services in rural areas in 2018, rising 7 pp from 69% in 2017 to 76%.

Figure 2: Superfast take-up, urban / rural breakdown (lines delivering superfast speeds as % of all premises)

	2018
England	44%
England urban	46%
England rural	32%

Source: Ofcom analysis of operator data

Just under half of consumers with superfast lines were taking up a superfast service in England in 2018 – this was slightly higher in urban areas.

Broadband Universal Service Obligation

While superfast coverage continues to improve, a significant minority of homes and businesses do not have access to decent broadband services.

In March 2018, the UK Government introduced legislation for a Broadband Universal Service Obligation, which will give eligible homes and businesses the right to request a broadband connection that delivers a decent broadband service of at least 10 Mbit/s download speed and 1Mbit/s upload speed. Ofcom is responsible for implementing the USO.

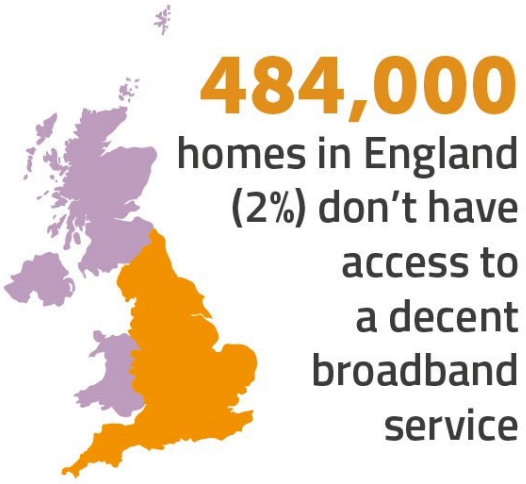


Figure 3: Premises unable access a decent broadband service[8]

	England		UK	
	2018	2017	2018	2017
Total number	484,000	790,000	677,000	1.1 million
% of premises	2%	3%	2%	4%

Source: Ofcom analysis of operator data

The number of homes and businesses unable to access decent broadband in England has fallen by over 300,000 in the past year

2% of premises in England cannot get decent broadband. Whilst this percentage appears lower than other UK Nations, England's large population means number of people affected is highest of all the UK Nations, at 484,000 homes and businesses.

Homes and businesses without access to decent broadband are more likely to be rural. Only 1% of urban premises did not have access such services, compared with 11% (322,000) of rural premises in England. This

[8] Premises are considered to have access to a decent fixed connection if the broadband speed is above a download speed of at least 10 Mbit/s and an upload speed of at least 1 Mbit/s.

has decreased from 15% of rural premises in 2017.

Figure 4: Premises unable access a decent broadband service: urban / rural breakdown

	2018	2017
England	2%	3%
England urban	1%	2%
England rural	11%	15%

Source: Ofcom analysis of operator data

Fixed Wireless Access is growing as a means of delivering broadband

Ofcom is investigating how the availability of Fixed Wireless Access (FWA) services might contribute to coverage of broadband services and hence provide a viable alternative to traditional fixed broadband services.

Some FWA services are delivered via licence exempt or light licensed spectrum. The results of our modelling show that 829,500 unique premises in England have a medium or high chance of being able to receive a decent broadband service from an FWA provider on licence exempt or light licensed spectrum. Of these, 32,500 currently have no other means of accessing a decent fixed broadband service. Further details on this can be found in our main Connected Nations report.

Other FWA services in England are delivered via mobile spectrum. For example, in February this year, BT/EE launched its 4G home broadband router which delivers a broadband service via existing mobile spectrum. Relish (owned by Three) has also deployed services in London, Swindon and Reading and has indicated that over 830,000 premises currently fall within its FWA coverage footprint. More than 20,000 premises are currently active on its network which includes over 2,000 business customers.

Ultrafast coverage

Ultrafast services are defined as being able to deliver broadband speeds that are greater than or equal to 300Mbit/s. This definition includes G.fast, cable networks and full fibre technologies. Premises that are very close to the cabinet and using G.fast services are capable of receiving very high speeds.

Figure 5: Ultrafast coverage

	Coverage, Percentage of premises with download speeds of at least		
	100Mbit/s	300Mbit/s	1Gbit/s
UK	55% (8↑pp)	50% (14↑pp)	6% (3↑pp)
England	58% (8↑pp)	52% (13↑pp)	6% (3↑pp)

Source: Ofcom analysis of operator data

1.5m premises in England have full fibre services available

In a 'Full fibre' or Fibre to the Premises network, fibre optic cables are connected all the way from the local exchange to the home or small business, and offer reliability and speeds of 1Gbit/s or more.[9]

The number of premises with full fibre services available has risen in the past year to 1.5 million or 6% of premises. This year we have also collected data from 12 additional full fibre providers.[10]

That's 1,483,000 premises out of a total of 24.5 million.

[9]We define full fibre coverage as where the network has been rolled out to a "lead-in" that will serve the consumer end premise and where the consumer would expect to pay a standard installation charge for that connection.

[10] A full list of providers who contributed coverage data can be found at Annex A of the main UK Connected Nations report

We expect deployment to continue to increase with established and alternative providers announcing plans to expand their full fibre networks. These include a range of initiatives in England such as:

- TalkTalk and Cityfibre partnering in York
- Community Fibre which is looking to cover various London boroughs including the City of London and Southwark
- WightFibre in the Isle of Wight, which aims to cover 53,000 premises by 2022
- Truespeed in the Southwest of England which aims to cover 75,000 premises by 2021 and 200,000 by 2025

Figure 6: Full fibre services coverage

	2018		2017	
	% of premises	No. of premises	% of premises	No. of premises
UK	6%	1.8 million	3%	861,000
England	6%	1.5 million	3%	793,000

Source: Ofcom analysis of operator data

Broadband coverage for small businesses

Businesses are increasingly reliant on communication services to sell goods and services, connect to customers, deal with suppliers and manage their workforce. Beyond this, many digital businesses rely on broadband services for the actual delivery of their products and services. Reliable and high quality broadband and mobile connections are becoming ever more important to commerce and to the wider economy.

Good connectivity is important for businesses of all sizes. In broad terms, larger enterprises are able to afford dedicated fibre-based services to meet their needs, so we focus here on provision for SMEs, which are businesses with 249 or fewer employees.

SMEs are often based in rural areas, where availability of superfast broadband services is lower.

The gap between homes and SMEs is closing

In 2018 the gap has continued to narrow between SMEs' access to superfast services in comparison to all homes and businesses. In rural parts of England, SMEs have poorer superfast coverage (67%) than premises as a whole (76%). By contrast 95% of urban SMEs in England have access to a superfast service.

Figure 7: Superfast broadband coverage for SMEs in England

	2018	2017	2016
Total superfast coverage	94%	92%	90%
Superfast coverage for SMEs with 1-250 employees	91%	85%	82%

Source: Ofcom analysis of operator data

Performance of fixed broadband services

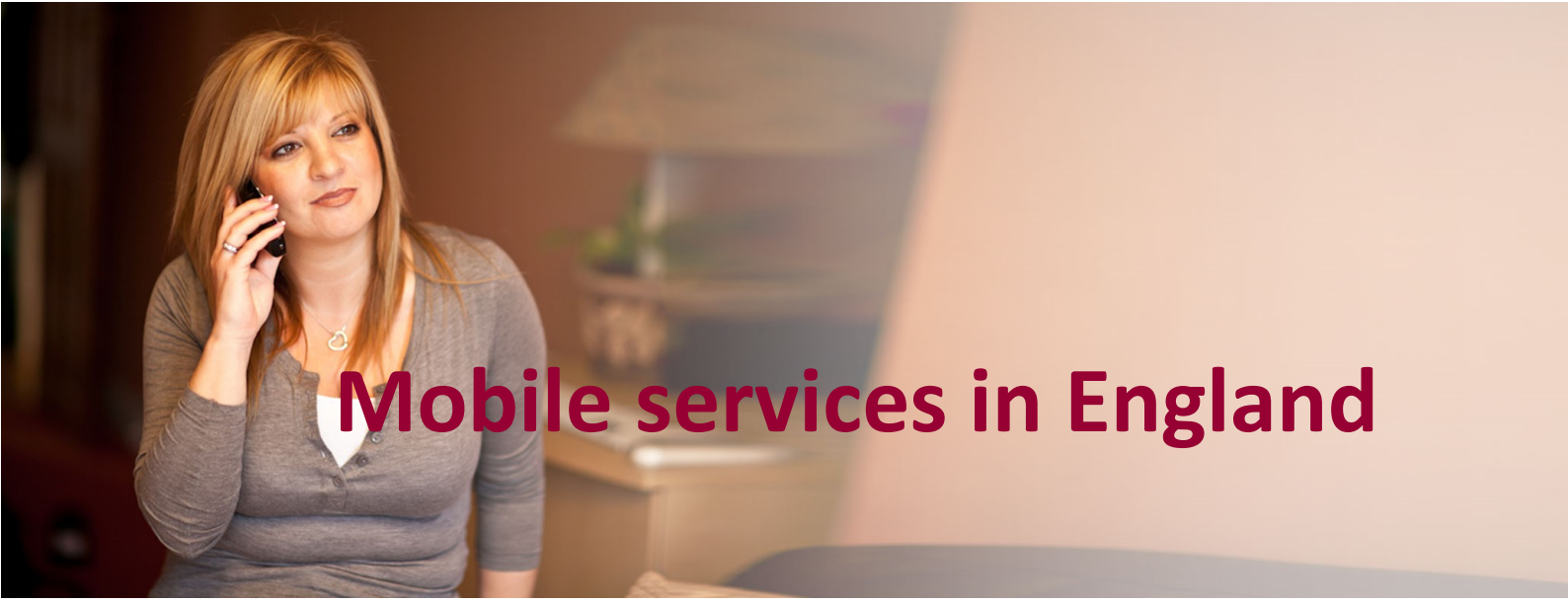
Average broadband data usage per month has risen by 27% in England

As reported in 2016 and 2017, premises with higher download speeds have higher data usage. Given speeds are higher on average in urban areas, average data usage is also 74GB higher. Average monthly data usage has gone up by 51GB (27%) in the past year.

Figure 8: Average speeds and data usage

	Download speeds (Mbit/s)	Upload speed (Mbit/s)	Monthly data use (GB)
England	50	7	241
England Urban	52	7	250
England Rural	34	7	176

Source: Ofcom analysis of operator data



Mobile services in England

Mobile coverage scorecard for 2018

Coverage from all 4 operators	England	UK
Outdoor geographic coverage		
4G	82% (14↑pp)	66% (17↑pp)
Voice	91% (3↑pp)	78% (9↑pp)
Indoor premises coverage		
4G	78% (10↑pp)	77% (12↑pp)
Voice	93% (2↑pp)	92% (2↑pp)
Major roads coverage		
4G	70% (15↑pp)	64% (18↑pp)
Voice	88% (5↑pp)	82% (8↑pp)

Source: Ofcom analysis of operator data

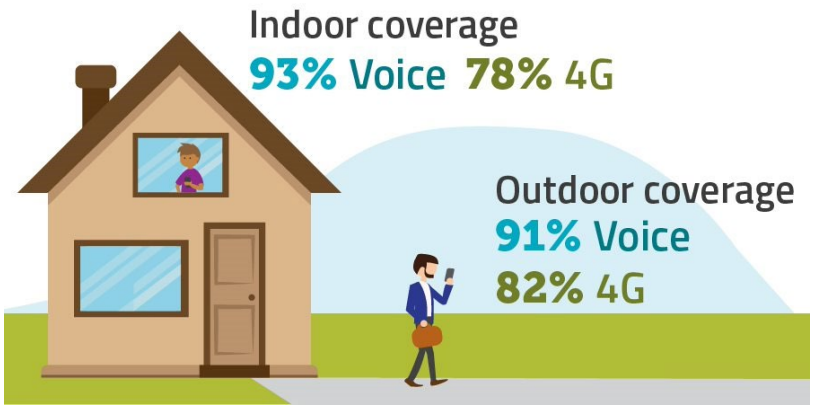
78% of homes and businesses in England have good 4G coverage from all four mobile network operators. Consumers will only access one operator at time – and individual operator coverage is higher at between 89% to 95%.

Whilst 4G roll out continues, England's relatively good coverage figures can hide regional and rural/urban variation. Only 42% of properties in rural areas have good 4G coverage from all four mobile network operators.

67% of homes and businesses in rural areas can receive a signal capable of providing voice services indoors, from all four operators. This has improved from 58% in 2017, but stands in contrast to 97% of premises covered by all 4 operators in urban areas.

We estimate that there are 18,000 homes and businesses that cannot access a decent fixed broadband service or get good 4G coverage.

The data in this report only offers a snapshot of coverage levels in England. More granular data can be found in our interactive tool and consumers can check coverage from operators at their address on Ofcom's coverage checker.



Coverage is provided using a combination of different mobile technologies

Several types of technology are used to deliver mobile services to people. Most modern mobile handsets support 2G, 3G, and 4G, whereas 5G devices will become available in 2019.

2G: this was the first digital mobile technology, launched in the UK in 1992. It is used to deliver: voice, text services and very low-speed data services.

3G: this is a later generation of digital mobile technology, launched in 2003. It can be used to deliver: voice, text and lower speed data services.

4G: this is the latest generation of mobile technology, launched in 2012. It can provide download speeds of over 10Mbit/s, and is used to deliver: voice, text and higher speed data services.

5G: will be the fifth generation of mobile technology. It is expected to deliver faster lower latency mobile broadband, and to enable more revolutionary uses in sectors such as manufacturing, transport and healthcare.

Our approach to reporting on mobile coverage

The levels of mobile coverage included in this report relate to where a sufficiently strong mobile signal is available to deliver a good experience to smartphone users.[11] This is where:

- Nearly all 90-second telephone calls are very likely to complete without interruption;
- Nearly all 4G connections will deliver a connection speed of at least 2Mbit/s. This is fast enough to browse the internet and watch glitch-free mobile video.

How you measure coverage is important, but so is *where* you measure it. To reflect the places in which people are likely to use their mobile, we look at coverage in three main ways:

- *Outdoor:* The percentage of geographic area where someone can use their phone while outdoors. This measurement is useful for assessing the likelihood of successfully using a phone while out and about.
- *Indoor:* The percentage of premises in which someone can use their phone. This measurement is useful for assessing the likelihood of successfully using a phone while at home or at work. This is estimated using the average reduction buildings cause to mobile signal levels. In next year's report we intend to provide more details on how signals are reduced by different types of building and the materials used in their construction.
- *Roads:* The percentage of roads on which someone can use their phone while inside a vehicle. This measurement is useful for assessing the likelihood of successfully receiving coverage whilst on the road.

Finally, we report on whether coverage is available from all four operators. This reflects the level of choice of provider available to

[11] We have used crowdsourced data from consumer handsets and drive testing to identify the signal levels needed to meet these targets at least 95% of the time.

people. It is often much lower than the coverage available from a single operator.

Despite improvements outlined in this report, coverage is still poor in many rural areas. Additional steps will be needed to improve coverage in these areas, such as coverage obligations in the award of the 700MHz spectrum band and the use of technical innovation offered by 5G.

The factors affecting the availability of coverage in rural areas is explored in our Economic Geography report, published alongside this report.[12]

Outdoor geographic coverage

91% per cent of England's geographic area is now covered by all four operators for telephone calls, up from 87% in June 2017.[13]

Outdoor access to 4G has also significantly increased from 68% to 82% over the same period.

Figure 9: Geographic mobile coverage

	% of landmass covered by all operators	No coverage from any operator)
4G	82%	2%
Voice	91%	1%

Source: Ofcom analysis of operator data

Indoor coverage

Nine in ten premises have indoor telephone coverage from all operators

93% of homes and businesses in England have indoor telephone call and texts coverage from all four mobile networks, up slightly from 91 % in June 2017.

Just over three quarters (78%) of homes and businesses in England should receive a good 4G signal from all operators, an increase of 10 percentage points. Whilst we welcome the improvement, indoor coverage is important for people and more must be done to increase it.

Figure 10: Indoor coverage - % of premises covered

	% of premises with indoor coverage from all operators	No coverage from any operator
4G	78%	1%
Voice	93%	0.2%

Source: Ofcom analysis of operator data

Mobile coverage and not spots by rurality

Figure 11: Complete not-spots and coverage by all operators

		Indoor voice (premises)	Indoor 4G (premises)	Voice (geographic)	4G (geographic)
Complete Not-spots	Overall	0%	1%	1%	2%
	Urban	0%	0%	0%	0%
	Rural	1%	5%	1%	3%
Coverage from all operators	Overall	93%	78%	91%	82%
	Urban	97%	83%	99%	98%
	Rural	67%	42%	90%	79%

Source: Ofcom analysis of operator data

Our metric of 'complete not-spots' reflects areas where there is no coverage from any operator, and this will be lower than 'not-spot' figures for any particular operator. To understand the coverage an individual

[12] https://www.ofcom.org.uk/research-and-data/multi-sector-research/availability-of-communication-services/economic-geography-2018

[13] These figures include voice calls over 4G Long Term Evolution (LTE™) services. LTE is the predominant 4G technology used in the UK.

consumer would receive, coverage by individual operators is included in Figure 12.

Of the entire English landmass, only 2% is unserved by any operator for 4G data services. This is largely in rural areas where 3% of rural premises do not have access to services from any operator.

Between 90% and 95% homes and businesses have 4G coverage indoors, whilst outdoor coverage of landmass varies between 88% to 94%.

Figure 12: Mobile coverage by provider

	O2	Vodafone	EE	Three
Indoor premises coverage				
4G	95%	94%	89%	90%
Voice	99%	99%	96%	96%
Outdoor geographic coverage				
4G	88%	91%	94%	92%
Voice	97%	98%	94%	95%

Source: Ofcom analysis of operator data

There are 18,000 premises in England that do not have decent fixed broadband or indoor 4G mobile coverage

Premises are considered to have access to a decent fixed connection if the broadband speed is a download speed of at least 10Mbit/s and an upload speed of at least 1Mbit/s and to have good mobile coverage if indoor 4G mobile coverage is available. Using this approach, we estimate that 98% of premises in England can receive both decent fixed and 4G mobile services[14], whilst 18,000 premises (0.1% of premises in England) are unable to access either. More premises currently have indoor 4G coverage than a decent fixed broadband service.

Roads coverage

Increasingly people need to be connected on roads, from communication, navigation, and infotainment services to safety aids.

88% of major roads (motorway and A roads combined) in England have voice coverage from all four operators, compared to 83% in 2017. 70% of major roads have in-car 4G coverage from all operators. In rural areas, coverage on major roads is only 60%, but this has risen significantly since 2017, from 41%.

Figure 13: Major roads mobile coverage

		Coverage from all four operators		No coverage from any operator	
		4G	Voice	4G	Voice
UK	Total	64% (18↑pp)	82% (8↑pp)	3%	1%
	Urban	83% (12↑pp)	95% (2↑pp)	0%	0%
	Rural	53% (21↑pp)	75% (11↑pp)	4%	2%
England	Total	70% (15↑pp)	88% (5↑pp)	1%	0.2%
	Urban	84% (10↑pp)	96% (2↑pp)	0%	0%
	Rural	60% (19↑pp)	83% (8↑pp)	2%	0%

Source: Ofcom analysis of operator data

Ensuring the accuracy of the mobile coverage data

The mobile coverage figures provided in this report rely on the accuracy of coverage prediction data supplied by the mobile operators.

In our last Connected Nations report update published in October 2018, we noted that we had identified operators' potential overprediction in EE's 3G and underprediction in Vodafone's 4G services. These operators

[14] This consists of 3% of premises that can receive decent fixed, good mobile and FWA services and 94% that can receive decent fixed and good mobile.

have subsequently resubmitted data on their coverage. Taking into account these adjustments we have re-stated historic mobile coverage levels including in the interactive dashboard.

We take the accuracy of the data supplied to us seriously given its importance to policy making and the information provided to people on coverage. In light of these corrections we decided to formally investigate these matters further.[15] [16] We have been reviewing the evidence and plan to publish an update in the new year.

Initiatives to improve mobile communications

Coverage is improving, but expectations are increasing and more must be done. We continue to work with Governments and companies to improve mobile services in the UK. Ofcom's key initiatives to improve services include:

- Making more spectrum available for coverage, capacity and performance with both 4G and 5G;
- Encouraging innovative new business models and services (such as 5G applications and rural broadband solutions) through proposals to enable shared access to spectrum; and
- Improving coverage in building and vehicles through legalising some types of mobile phone repeaters.

Taking steps to improve coverage in rural areas by and on rail services

We have supported steps to improve coverage in rural areas by addressing barriers and reducing costs. These included changes to the Electronic Communications Code and to planning laws, to make it easier and cheaper to deploy mobile infrastructure.

Ofcom has provided advice to the UK Government following technical analysis of a variety of options to improve mobile coverage.[17] The advice focused on public subsidy, rural wholesale access (commonly known as rural roaming), infrastructure sharing and planning reform.

We have also recently published our advice to Government on current and future demand for data services from passengers on the UK's mainline railways.[18]

Making information on coverage more useful, accurate and widely available

We are launching two Application Programme Interfaces (APIs) on fixed broadband and mobile coverage to enable third party websites and apps (such as content providers and price comparison websites) to use this information.

Ofcom is also facilitating an industry working group to provide better information on mobile coverage.

More detail on these initiatives, can be found in our UK Connected Nations report.

[15] https://www.ofcom.org.uk/about-ofcom/latest/bulletins/competition-bulletins/open-cases/cw_01232
[16] https://www.ofcom.org.uk/about-ofcom/latest/bulletins/competition-bulletins/open-cases/cw_01231
[17] https://www.ofcom.org.uk/phones-telecoms-and-internet/coverage/advice-government-improving-mobile-coverage
[18] https://www.ofcom.org.uk/__data/assets/pdf_file/0024/123657/Rail-connectivity-advice-DCMS.pdf