



## BRIEFING PAPER

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# Superfast broadband in the UK

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## Summary

### What is superfast broadband?

There is no single definition of superfast broadband. The UK Government defines superfast broadband as download speeds of 24 megabits per second (Mbps), while Ofcom (the UK telecoms regulator), the EU define it as 30 Mbps. The Scottish and Welsh Government also use 30 Mbps.

At 24 Mbps it would take approx. 6 minutes to download a standard definition film (1 gigabyte (GB)).

### Superfast broadband programme

The roll-out of superfast broadband in the UK has primarily been led by private companies such as Openreach and Virgin Media. The Government's policy is to support the roll-out of superfast broadband to those areas not reached by private investment. To do so, the UK Government has been providing funding to local bodies in England and the devolved Administrations through the superfast broadband programme. The programme is managed by [Broadband Delivery UK \(BDUK\)](#), part of the Department of Digital, Culture, Media and Sport (DCMS).

Under the superfast broadband programme local bodies and the devolved Administrations draw up broadband delivery plans and procure contracts with broadband providers to build infrastructure to target areas in their regions. Information about and links to local broadband projects across the UK is provided in BDUK's [table of local broadband projects](#), which is updated quarterly.

Ofcom reported that as of February 2018, 95% of UK premises had access to superfast broadband based on the Government's definition (24 Mbps). The Government expects that coverage will extend to 97% by 2020.

The superfast broadband programme has largely delivered connections using Fibre-to-the-Cabinet (FTTC) technology, which is a part-fibre, part-copper technology. FTTC is cheaper and faster to deliver than full-fibre broadband but has been described as less "future proof". The [Commons Culture Media and Sport Select Committee concluded in 2016](#) that the decision to use FTTC was, "on balance", the right decision but has had the result of tackling easier to reach premises first, leaving uncertainty about when the remaining premises will be served.

### Superfast broadband in the devolved Administrations

The UK Government has primary responsibility for broadband policy and coverage targets because telecommunications is a reserved power. However, the practical delivery of superfast broadband roll-out projects is led by local bodies in England (predominantly local authorities) and the devolved Administrations. This means that the devolved Administrations can set their own superfast broadband targets.

The Scottish and Welsh Governments are both conducting tender processes for new contracts to deliver superfast broadband infrastructure to premises not yet reached by the superfast broadband roll-out. The Scottish Government has a target to deliver superfast broadband (30Mbps) to 100% of Scottish premises coverage by 2021, under its [Reaching 100% Programme](#) (R100).

## Support for those without superfast broadband

### Voucher schemes

The UK-wide [Better Broadband Scheme](#) provides vouchers up to £350 to subsidise the cost of a wireless broadband connection for premises unable to receive of 2 Mbps download speeds; it is set to run until December 2018.

The UK-wide [gigabit voucher scheme](#) provides vouchers worth up to £2,500 to support businesses install a “gigabit capable connection” (1 Gbps (1000 Mbps) upload or download speeds). See the Library briefing paper [Full-fibre networks in the UK](#) for more information.

The Welsh Government also has its own separate [voucher schemes](#).

### Universal Service Obligation (USO) – from 2020

The UK-wide USO provides a legal right to request a broadband connection of 10 Mbps download speed and 1 Mbps upload speed, up to a reasonable cost threshold (£3400). Ofcom is working on the practical delivery of the USO; it is expected to be available in 2020. See the Library briefing paper: A [Universal Service Obligation \(USO\) for broadband](#).

### Community-led schemes

Communities without superfast broadband can also consider developing their own [community-led scheme](#) to bring fibre broadband to their area. The UK Government does not provide specific funding for these schemes but has published [guidance](#) and [case studies](#) that provide more information.



# 1. Quick facts about broadband

## 1.1 Broadband speeds and broadband technology

### Download and upload speeds

Broadband speeds are expressed as the amount of data downloaded or uploaded per second, usually as megabits per second (Mbps).

Download speeds refer to how long it takes to download data to a computer or device. Upload speeds refer to how long it takes for a file to transfer from a device to the internet.

Most typical internet activities, such as browsing websites and checking emails, require higher download speeds than upload speeds.

Reasonable upload speeds are necessary for applications such as video calling and uploading large files to social media. For example, Skype recommended in 2016 that a minimum upload connection speed of 0.5 Mbps is required for a high-quality video call.<sup>1</sup>

The upper limit of the speeds accessible at a premises will depend on the type of technology used to deliver the broadband connection. However, the *actual speed received* by the customer may depend on several other factors, for example, the broadband package purchased by the customer or the number of people using the connection at the same time.

Some examples of common internet activities and how long it takes to download content are set out in the following table, provided by Ofcom (the telecommunications regulator) in its December 2017 *Connected Nations* report:

WHAT CAN YOU DO WITH DIFFERENT DOWNLOAD SPEEDS?				
Activity	10 Mbit/s	30 Mbit/s	300 Mbit/s	1 Gbit/s
<b>Streaming music</b>	Yes	Yes	Yes	Yes
<b>Downloading an album</b>	1 - 2 minutes	30 - 60 seconds	< 10 seconds	< 5 seconds
<b>Streaming an HD movie</b>	Yes	Yes	Yes	Yes
<b>Downloading an HD movie</b>	1 - 1½ hours	30 minutes	< 5 minutes	< 2 minutes
<b>Streaming an ultra HD movie</b>	No	Yes	Yes	Yes
<b>Downloading an ultra HD movie</b>	5 hours	1½ - 2 hours	<15 minutes	<5 minutes

Source: Ofcom, [Connected Nations 2017](#), December 2017. 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. 1 gigabit per second (Gbps) is equal to 1000 Mbps.

<sup>1</sup> Ofcom, [Achieving decent broadband connectivity for everyone](#), 16 December 2016.

## What is an acceptable broadband speed?

Ofcom stated in 2017 that download speeds of 10 Mbps are necessary to deliver an 'acceptable user experience' for typical home broadband usage, allowing for users to stream films, carry out video conferencing and browse the web at the same time.<sup>2</sup>

Both Ofcom and the Government consider that a "decent" broadband connection is one capable of delivering a download speed of at least 10 Mbps and an upload speed of at least 1 Mbps.<sup>3</sup> This is the specification for the Government's Universal Service Obligation (USO) for broadband (see Section 4.2 below).

## What is superfast broadband?

There is no single definition of superfast broadband. The UK Government defines superfast broadband as download speeds of 24 Mbps.<sup>4</sup> Ofcom and the EU Commission define it as 30 Mbps.<sup>5</sup>

Superfast broadband is available to 95% of premises in the UK as of February 2018 (based on the Government's definition of 24 Mbps download speed).<sup>6</sup>

The UK Government's roll-out of superfast broadband has mainly delivered connections using **fibre-to-the-cabinet (FTTC) technology**.

FTTC is a part-fibre technology: fibre optic cables run to a street cabinet, and then existing copper telephone wires are used to connect the cabinet to individual premises. The speed of connection decreases the further away from the cabinet the premises is based, because the signal loses strength as it travels along the copper wire.

Other technologies are also capable of delivering superfast broadband, including cable technology (mainly delivered by Virgin Media) and fixed wireless connections. Wireless connections are important for providing superfast broadband connections to rural areas.

For more information, see the Glossary in Section 6 of this paper and in the POSTbrief [Telecommunications Infrastructure: Cabling, Ducts and Poles](#) (March 2017).

## What is full-fibre broadband?

Full-fibre broadband, also referred to as fibre-to-the-premises (FTTP) or fibre-to-the-home (FTTH), is a broadband technology that involves fibre optic cables running directly to each premises. Fibre optic cables use light signals to carry data, so the signals travel very fast and do not lose strength with the distance. Therefore, much higher download and upload speeds are possible.

The UK Government defines superfast broadband as download speeds of at least 24 Mbps. Ofcom defines it as 30 Mbps.

<sup>2</sup> Ofcom, [UK Home broadband performance: a consumer summary](#), 24 March 2016.

<sup>3</sup> Ofcom, [Connected Nations 2017](#), December 2017.

<sup>4</sup> DCMS, [Broadband Delivery UK](#), updated 27 March 2018, [accessed 25 May 2018].

<sup>5</sup> Ofcom, [Connected Nations: Spring Update 2018](#), 30 April 2018.

<sup>6</sup> Ofcom, [Connected Nations: Spring Update 2018](#), 30 April 2018.

Full-fibre technology is capable of delivering speeds up to 1 gigabit per second (Gbps). 1 Gbps is equal to 1000 Mbps.

Full-fibre technology is typically more expensive to install than FTTC technology as it requires new infrastructure to be built. However, full-fibre is more reliable and cheaper to maintain than FTTC networks and is less likely to slow down when many people use the connection at the same time.<sup>7</sup>

The Government now has a target to build a nationwide full-fibre network by 2033. More information is provided in the Library briefing paper: [Full-fibre networks in the UK](#) (CBP8392, 3 September 2018).

## 1.2 What are the challenges for delivering superfast broadband to rural areas?

Broadly speaking, broadband connectivity and speeds tend to be better in urban areas than in rural areas (see Section 2). There are some urban premises that also have poor broadband connections, for example due to a lack of sufficient infrastructure in the area, or features of the available network infrastructure that means that delivering superfast broadband to those premises is not straightforward.<sup>8</sup>

Challenges for delivering high-speed broadband connections to rural areas include:

- high costs of building fibre infrastructure in areas with challenging geography/terrain; and
- low population density of many rural areas.

Low population densities reduce the returns that telecoms operators receive from customers taking up services, which means that commercial operators are less likely to service these areas without public support. Some full-fibre providers do target specific rural areas, for example, [Gigaclear](#) and [TrueSpeed](#).

Some rural communities have invested in full-fibre networks through community schemes, for example, the [B4RN](#) network in Lancashire (see Section 4.3).

Wireless and satellite connections can provide connectivity options for rural areas where fixed line infrastructure is difficult to build. Wireless connections and mobile broadband networks can deliver superfast broadband speeds depending on the number of people using the connection. However, satellite connections often suffer from slow response times (latency), which limits their use in applications such as live video streaming.

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<sup>7</sup> Ofcom, [Building a full-fibre future](#), 26 April 2018.

<sup>8</sup> DCMS, [BDUK Market Test Pilots: Exploring superfast coverage beyond 95%](#), summary of initial findings from feasibility phase, February 2015, section 4.1, accessed 7 September 2018.

### 1.3 Is telecommunications a reserved power?

The power to legislate for telecommunications is reserved to the UK Parliament.<sup>9 10 11</sup> The UK Government has primary responsibility for setting UK-wide broadband policy and coverage targets.

However, the practical delivery of superfast broadband roll-out projects, under the superfast broadband programme, is led by local bodies in England and the devolved Administrations (see Section 2).<sup>12</sup> This means that local bodies in England and the devolved Administrations have developed their own broadband strategies to guide the infrastructure build in their region, including setting their own roll-out targets.

“Local bodies” in England are usually local authorities but could be several local authorities acting as a jointly as an enterprise partnership.<sup>13</sup>

Information about progress of broadband roll-out projects in the devolved Administrations is provided in Section 5 of this paper.

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<sup>9</sup> [Section C10 of Schedule 5 of the Scotland Act 1998.](#)

<sup>10</sup> [Section C9 of Schedule 7A of the Wales Act 2017.](#)

<sup>11</sup> Northern Ireland Department for the Economy, [Broadband policy context in Northern Ireland](#) and Cabinet Office, [Devolution settlement: Northern Ireland](#), 20 February 2013 [accessed 5 June 2018].

<sup>12</sup> Broadband Delivery UK, [Broadband delivery programme: delivery model](#), September 2011

<sup>13</sup> DCMS, [Broadband Delivery Programme: Delivery Model, Broadband Delivery UK](#), May 2011.



## 2. Superfast broadband coverage in the UK

**This section uses Ofcom's definition of superfast broadband: 30 Mbps download speed.**

**The UK Government uses a different definition – 24 Mbps – for its target of 95% coverage.**

Ofcom publishes official data on broadband coverage in its [Connected Nations](#) reports. At the time of publishing, the most recent data was Ofcom's *Connected Nations* October 2018 Update; the data was collected in May 2018.

Constituency statistics can be downloaded from the Library website: [Constituency data: broadband coverage and speeds](#) (November 2018). The Library can provide MPs and their staff with detailed coverage information for constituencies and smaller local areas on request.





















The tables and maps below summarise broadband connectivity in each UK country and how superfast broadband coverage varies regionally.

BROADBAND CONNECTIVITY ACROSS THE UK, MAY 2018					
Measure	England	Scotland	Wales	Northern Ireland	UK
Superfast availability	94.0%	91.5%	92.2%	88.1%	<b>93.5%</b>
Ultrafast availability	49.9%	42.9%	27.1%	38.5%	<b>47.9%</b>
Full fibre availability	4.8%	2.8%	5.2%	8.3%	<b>4.8%</b>
Unable to receive 2 Mbps	0.4%	1.1%	1.0%	2.3%	<b>0.5%</b>
Unable to receive 10 Mbps	2.0%	4.3%	3.5%	5.9%	<b>2.4%</b>
Below Universal Service Obligation	2.6%	5.0%	4.2%	6.1%	<b>3.0%</b>

*Superfast broadband: download speeds greater than 30 Mbps.*

*Ultrafast broadband: download speeds greater than 300 Mbps.*

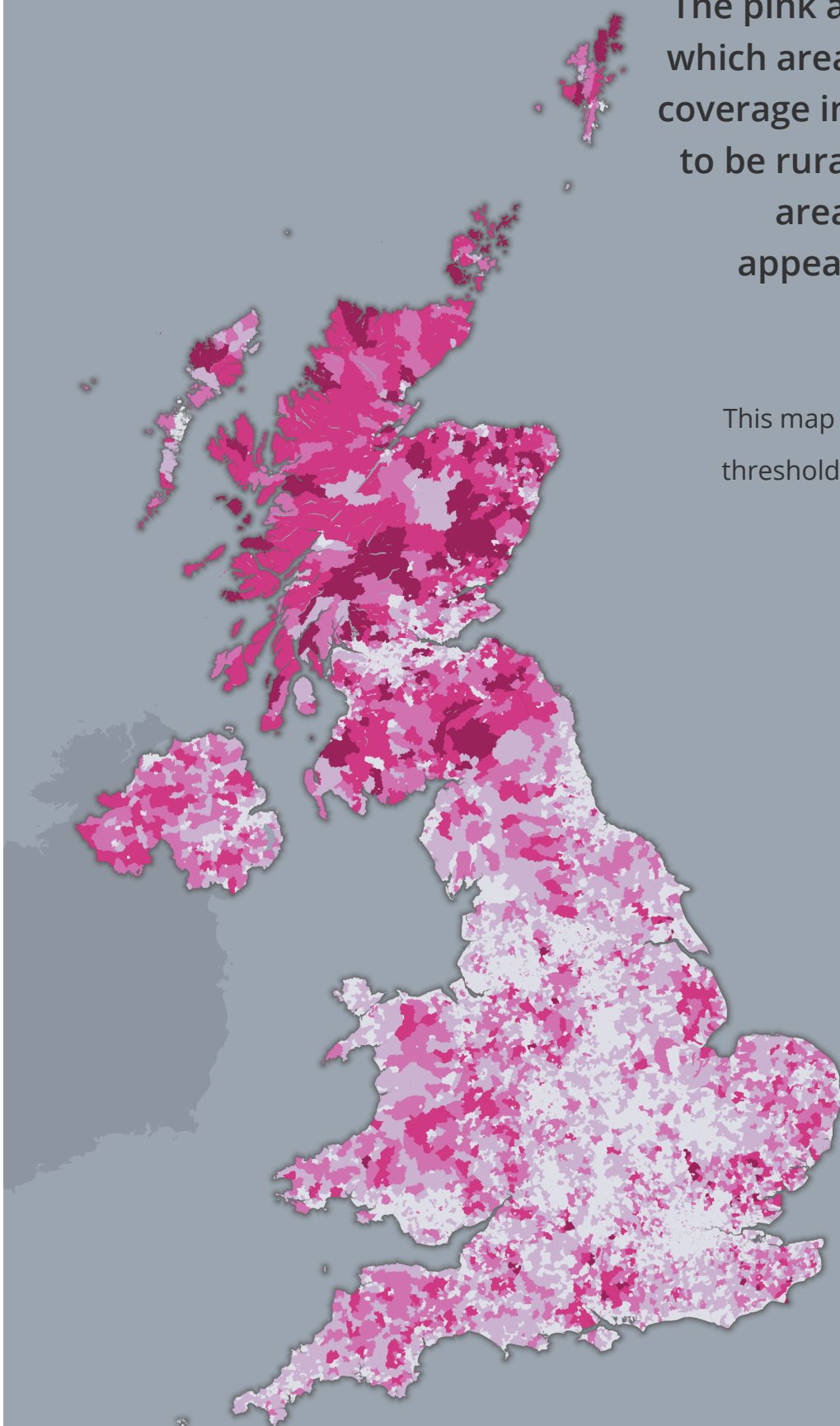
*Below Universal Service Obligation: unable to receive 10 Mbps download speed, 1 Mbps upload speed and other quality parameters (see Section 3.1).*

SUPERFAST COVERAGE VARIES ACROSS ENGLAND			
% of premises without access to 30 Mbps			
Area	% lacking superfast	Area	% lacking superfast
North Yorkshire & Humber	 12.7%	Lancashire & Cumbria	 5.8%
Dorset, Devon & Cornwall	 9.7%	South & West Yorkshire	 5.4%
East Anglia	 9.3%	Nottinghamshire & Derbyshire	 5.2%
Bristol, Somerset, Gloucs. & Wilts.	 9.3%	North East England	 5.0%
West Midlands Outer	 8.1%	Merseyside & Cheshire	 4.4%
Essex, Herts. & Beds.	 7.2%	Inner London	 3.2%
Kent & Sussex	 6.3%	Greater Manchester	 2.7%
Northants, Leics. & Lincs.	 6.3%	Birmingham & Surrounds	 2.6%
Oxfordshire, Berkshire & Bucks.	 6.2%	London Outer North	 2.4%
Surrey, Hampshire & Isle of Wight	 6.0%	London Outer South	 2.2%

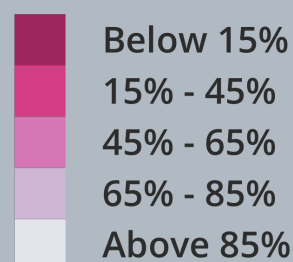
# 93.5% of premises in the UK have access to superfast broadband

The pink areas on this map show which areas still lacked superfast coverage in May 2018. These tend to be rural & sparsely-populated areas - which is why it may appear that less 93.5% of the country is covered.

This map shows coverage at the 30 Mbps threshold, which is how Ofcom measures superfast broadband.

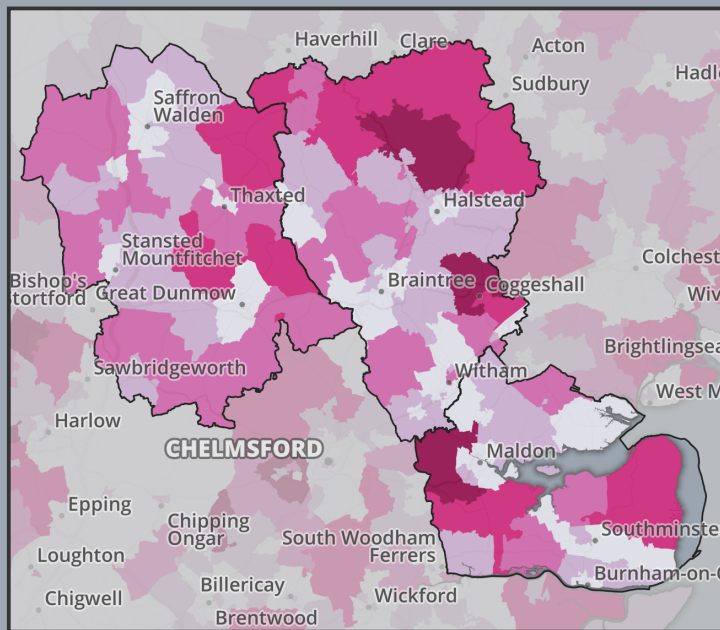


## Availability



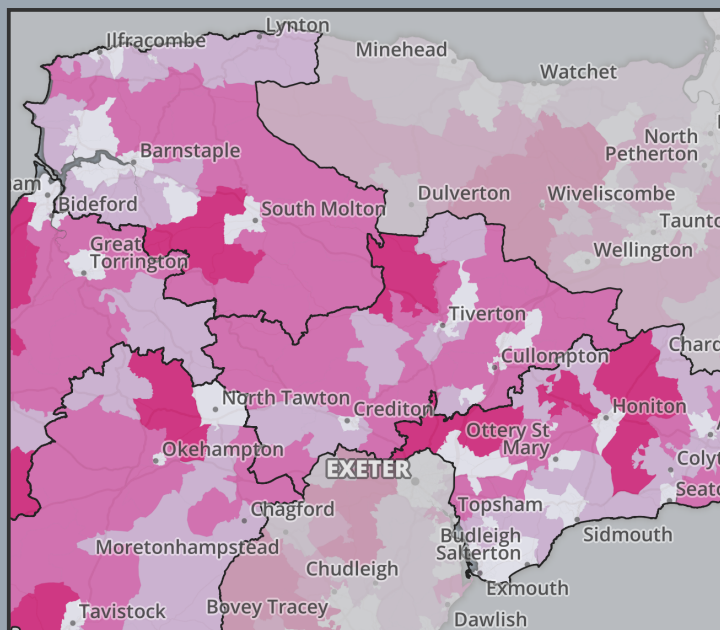
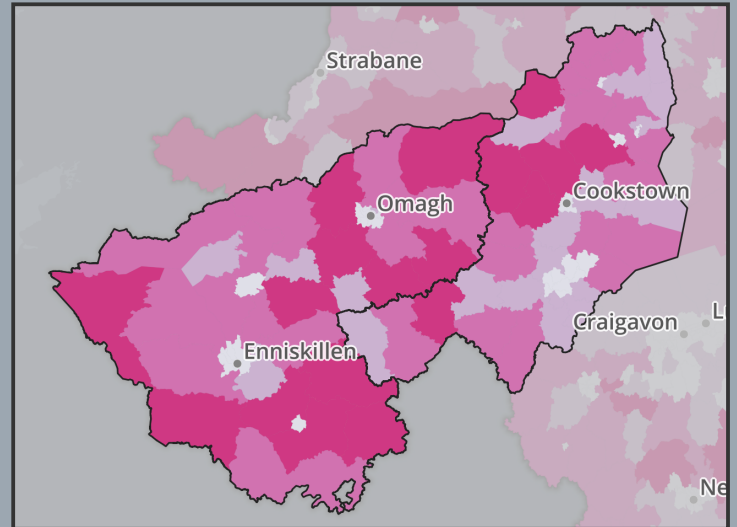
# Which areas still lack superfast access?

This page highlights selected parts of the UK with lower than average superfast coverage. It isn't comprehensive, so see our data files for the full picture.



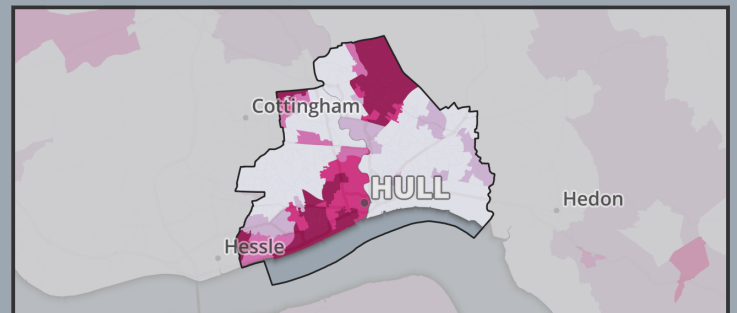
**Parts of Essex (left):** Uttlesford, Braintree & Maldon local authorities all have among the lowest superfast coverage in England.

**South-western Northern Ireland (below)**



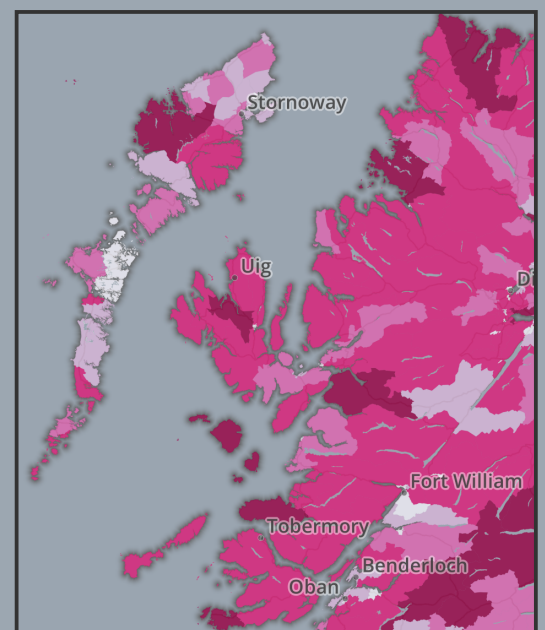
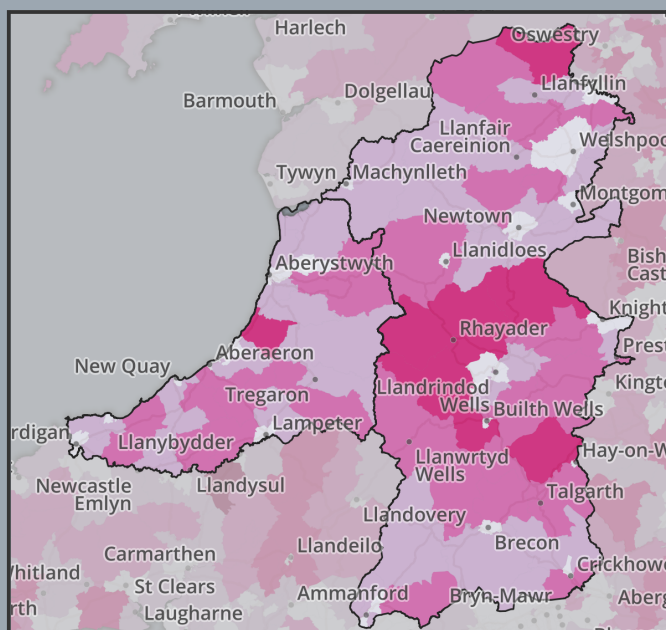
**Parts of Devon (left)**

**Hull (below):** the lowest superfast coverage of any English city



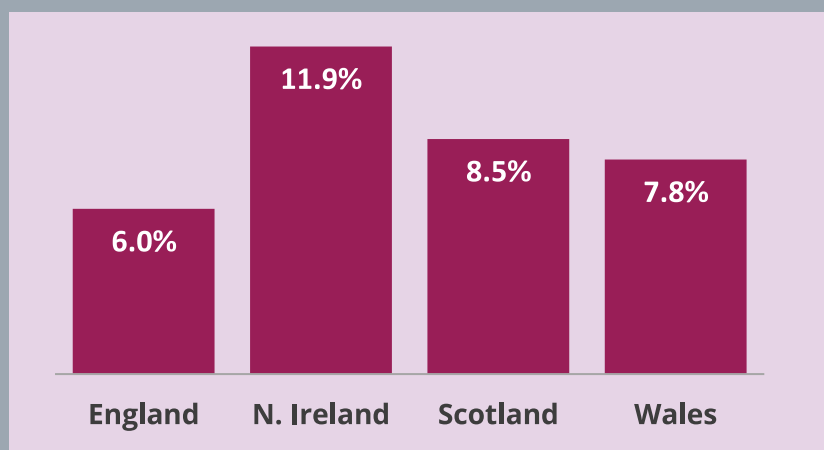
**Mid Wales  
(first right)**  
Powys &  
Ceredigion  
shown

**Scottish  
Highlands &  
Islands  
(second right):**  
Na h-Eileanan  
Siar & western  
Highland  
shown



England has the highest superfast availability of the four UK countries, followed by Wales and Scotland. Northern Ireland has the lowest. Within England, coverage is lowest in North Yorkshire & Humber and highest in Outer London.

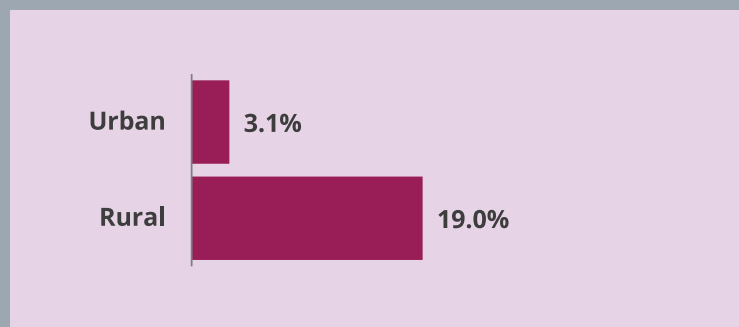
Percentage of premises without access to superfast broadband (30 Mbps)



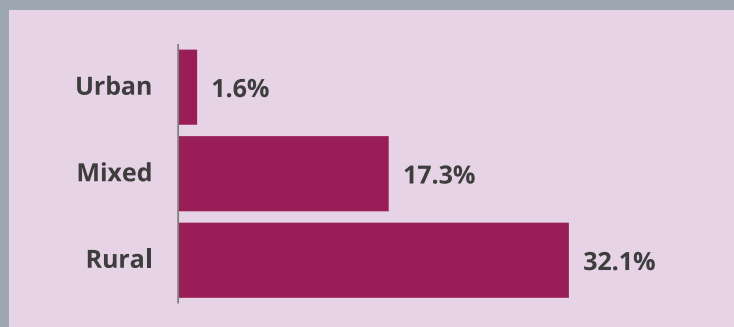
## Almost two thirds of premises without superfast coverage are in rural areas

As of May 2018, only a minority of urban premises lack access to superfast speeds. Rural superfast coverage is substantially lower than urban coverage in every UK nation. **The charts below show the percentage of rural/urban premises lacking superfast access in each country.** As of May 2018 there were 1.88 million premises lacking superfast access of which 1.16 million were in rural areas.

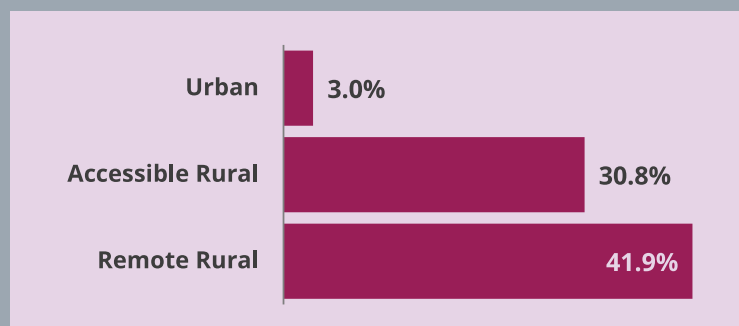
### ENGLAND



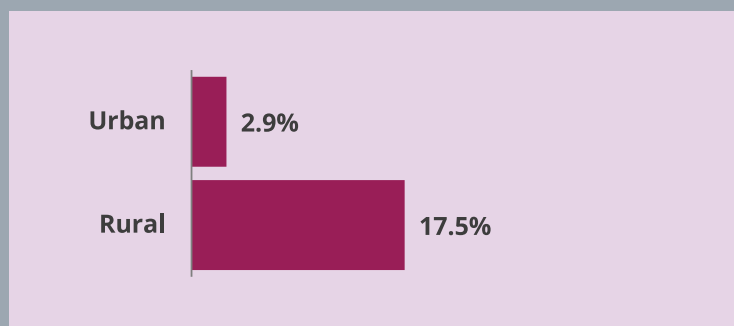
### NORTHERN IRELAND



### SCOTLAND



### WALES



Note that Scotland and Northern Ireland have different classifications of rurality to England and Wales, which may affect the analysis.



## 3. Superfast broadband programme

The roll-out of superfast broadband in the UK has primarily been led by private companies such as Openreach and Virgin Media.

The superfast broadband programme – also called the BDUK programme – is the Government’s programme for delivering superfast broadband to those areas that would not be reached by private investment.

The programme is managed by [Broadband Delivery UK](#) (BDUK), part of the Department of Digital Culture Media and Sport (DCMS).

### 3.1 How does the superfast broadband programme work?

Under the superfast broadband programme, the UK Government has been providing funding to local bodies in England and the devolved Administrations to support the roll-out superfast broadband infrastructure in their regions.

Local bodies and the devolved Administrations draw up broadband delivery plans and procure contracts with broadband providers to build infrastructure to target areas in their regions.<sup>14</sup> “Local bodies” in England are local authorities or several local authorities acting as a jointly as an enterprise partnership.<sup>15</sup>

BDUK developed framework contracts to assist local bodies in the procurement process, although the local bodies were able to procure outside this framework if they wanted to.

In addition to UK Government funding, the devolved Administrations and local bodies in England were expected to seek additional funding to support the superfast broadband roll-out in their area.<sup>16</sup> This additional funding could be sourced from their own budgets, the EU or private investment.

For more information about funding, see Section 3.3. More information about projects in the devolved Administrations is provided in Section 5.

Local bodies and the devolved Administrations lead the roll-out of superfast broadband in their regions.

<sup>14</sup> For detailed information about how the programme worked and the criteria that projects had to meet, see: DCMS, [Broadband Delivery Programme: Delivery Model, Broadband Delivery UK](#), May 2011.

<sup>15</sup> DCMS, [Broadband Delivery Programme: Delivery Model, Broadband Delivery UK](#), May 2011.

<sup>16</sup> DCMS, [Broadband Delivery Programme: Delivery Model, Broadband Delivery UK](#), May 2011.



**Box 1: How to find information about local broadband projects**

To find the local broadband project operating in a particular area, see DCMS's [map of local projects](#). A list is also provided in BDUK's [Next Generation Network Infrastructure Deployment Plan](#) (March 2015).<sup>17</sup>

Information about broadband contracts for each local project is provided in BDUK's Local Body Information Spreadsheet, which is updated quarterly.<sup>18</sup> A link to the spreadsheet can be found on the Gov.uk webpage: [Broadband Delivery UK](#), under the heading "superfast broadband programme".

The spreadsheet includes details such as:

- the funding for each project;
- the progress of the project under Phase 1 and 2 (e.g. "in delivery" or "post-deployment")
- take up rates for superfast broadband under the project.
- links to local information.

## 3.2 Delivery phases of the programme

The superfast broadband programme consists of three phases.<sup>19</sup> The phases refer to coverage targets as well as the stages in which funding was provided and contracts were signed.

**Phase 1:** involved £530 million funding from the UK Government and aimed to provide superfast broadband coverage to 90% of UK premises by early 2016 and access to basic broadband (2Mbps) for all UK premises by December 2015.<sup>20</sup> Ofcom confirmed that the Phase 1 target of 90% coverage was met in June 2016.<sup>21</sup> In July 2017, 99.5% of UK premises had access to download speeds of 2 Mbps (155,000 premises (0.5%) did not).<sup>22</sup> As of August 2018 some Phase 1 projects were still in delivery.<sup>23</sup>

**Phase 2:** involved £250 million additional central Government funding to extend superfast broadband coverage to 95% of UK premises by the end of 2017.<sup>24</sup> The UK Government stated this target was met by the end of December 2017<sup>25</sup> whereas Ofcom confirmed it was met by February 2018.<sup>26</sup> As of September 2018 most Phase 2 projects were in delivery or had contracts signed.<sup>27</sup>

<sup>17</sup> DCMS, [Next Generation Network Infrastructure Deployment Plan](#), March 2015, page 9.

<sup>18</sup> A link to the table can be found on the Gov.uk webpage: [Broadband Delivery UK](#), under the heading "superfast broadband programme".

<sup>19</sup> DCMS, [Next Generation Network Infrastructure Deployment Plan](#), March 2015.

<sup>20</sup> DCMS, [Evaluation of the Economic Impact and Public Value of the Superfast Broadband Programme Final Report](#), August 2018, page 18.

<sup>21</sup> Ofcom, [Connected Nations 2016](#), 16 December 2016.

<sup>22</sup> Ofcom, [Connected Nations 2017](#), 15 December 2017.

<sup>23</sup> BDUK's [table of local broadband projects](#) as of 17 August 2018 [accessed 7 September 2018]

<sup>24</sup> DCMS, [Spending Round 2015/16 - full details of funding for DCMS bodies published](#), 4 July 2013

<sup>25</sup> DCMS, [Superfast broadband now available to more than 19 out of 20 UK homes and businesses](#), 29 December 2017.

<sup>26</sup> Ofcom, [Connected Nations Update: Spring 2018](#), 30 April 2018.

<sup>27</sup> BDUK's [table of local broadband projects](#) as of 17 August 2018 [accessed 7 September 2018]

**Phase 3:** There is not a clear definition of “Phase 3” but it generally refers to extending the programme further. In some cases this involves conducting further procurement rounds by re-investment of funding gained from both efficiency savings in the programme and through “contract clawback” (see Section 3.4 below).<sup>28</sup>

The Government’s [Future Telecoms Infrastructure Review](#) (July 2018) stated that the Government will use £200 million funding identified as remaining from the superfast programme to prioritise delivery of full-fibre networks (or other gigabit capable alternatives) through “Phase 3” of the programme.<sup>29</sup> No further details about where this funding will be delivered and how many premises are expected to be covered have been published. For information about full-fibre networks, see the Library briefing paper: [Full-fibre networks in the UK](#).<sup>30</sup>

The UK Government expects that additional procurements will extend superfast broadband coverage to 97% of UK properties by the end of 2020.<sup>31</sup>

### 3.3 UK Government funding for the superfast broadband programme

The total amount of money committed by the Government to the programme is £780 million, made of £530 million for Phase 1 and £250 million for Phase 2 (see Section 3.2).<sup>32</sup>

In terms of money spent, DCMS publish figures for the amount of funding so far provided to each local broadband project in England and the devolved Administrations, under both Phase 1 and Phase 2 of the superfast broadband programme in the [BDUK Local Body Information Spreadsheet](#).<sup>33</sup> The spreadsheet is updated quarterly and also includes details of:

- the contracts signed by each local body and the devolved Administrations;
- the take-up rate of superfast broadband in each region; and
- links to further information from each local body.

Box 2 provides a summary of the funding that had been committed to contracts as of September 2018.

The total amount of money committed by the UK Government to the programme is £780 million.

<sup>28</sup> For example, Superfast Essex, [New Superfast Essex Phase 3 rollout plans are set to speed up broadband for an additional 24,000 homes and businesses](#), accessed 7 September 2018.

<sup>29</sup> DCMS, [Future Telecoms Infrastructure Review](#), July 2018.

<sup>30</sup> Commons Library briefing paper, [Full-fibre networks in the UK](#) (CBP 8392, 3 September 2018).

<sup>31</sup> DCMS, [Future Telecoms Infrastructure Review](#), July 2018, Ministerial Foreword.

<sup>32</sup> DCMS, [Evaluation of the Economic Impact and Public Value of the Superfast Broadband Programme Final Report](#), Ipsos MORI, Simetrica, George Barrett and Dr. Pantelis Koutroumpis, August 2018.

<sup>33</sup> A link to the table can be found on the Gov.uk webpage: [Broadband Delivery UK](#), under the heading “superfast broadband programme” [accessed 1 November 2018]

Section 5 provides more detailed information about funding sources for broadband projects in the devolved Administrations.

### Box 2: Funding spent on broadband contracts in each nation under the superfast broadband programme and number of premises connected

The following table provides a summary of the funding that had been committed to contracts in each nation as part of the superfast broadband programme, as at September 2018.

This means that a contract has been signed with a provider to deliver connections using that funding; it does not necessarily represent the total amount of funding provided to that nation. Additional funding means extra funding provided by the local body, for example from their own budgets, the EU or private investment. Funding for Scotland is delivered across two projects – “Highlands and Islands” and “Rest of Scotland” (see Section 5).

	UK Government funding (£)	Additional funding (£)	Total (£)	Premises connected (June 2018)
Rest of Scotland	50,000,000	107,575,000	157,575,000	560,939
Highlands and Islands	50,830,000	75,600,000	126,430,000	142,596
Wales	66,967,000	156,407,000	223,374,000	700,364
Northern Ireland	11,454,000	21,954,000	33,408,000	66,572
England (all local bodies)	536,260,914	555,618,148	1,091,879,062	3,477,726
Total UK	715,511,914	917,154,148	1,632,666,062	4,948,197

Source: BDUK Table of Local Broadband projects based on contracts signed at 24 September 2018; a link to the table is available on the [Broadband Delivery UK](#) webpage.

## Gainshare (contract clawback) and efficiency savings

The BDUK framework contracts between local bodies and broadband providers (usually BT) for broadband roll-out contain clauses that require the provider to reinvest further funding, once the take-up of superfast broadband (i.e. the number of consumers that have purchased superfast broadband packages on the newly-available network) reaches 20%.<sup>34</sup>

Funding returned for re-investment through this mechanism is called “contract clawback” or “gainshare” funding.

The take-up rates (i.e. the number of consumers that have purchased superfast broadband packages on the newly-available network) affect the profit that the infrastructure provider gains from building the network. The clawback mechanism allows the public sector to share the profits of higher than expected take up.<sup>35</sup>

In evidence to the CMS Committee in 2016, the then Minister of State for Culture and the Digital Economy, Ed Vaizey, stated that the money returned would go to fund additional broadband roll-out, either by BT or other providers:

<sup>34</sup> [PQ 27855 \[on broadband\], 26 Feb 2016.](#)

<sup>35</sup>

Q1080 **Damian Collins:** Thank you. Two brief questions, Mr Chairman. You touched earlier on clawback money from phase 1. Does that go back into the Department's pot or will that be available to support additional rollout of broadband?

**Mr Vaizey:** That is going into additional rollout. It can either be used by [BT] Openreach to extend, if that is what the contracting authority wants to do, or it can be used potentially by a competitor who contracts with the local authority to undertake some rollout.

Q1081 **Chair:** Just to be clear on that, a local authority can take the clawback money and go to an alternative provider and say, "Here is the dosh, get building" by agreement, essentially?

**Mr Vaizey:** Yes.<sup>36</sup>

In December 2017 the UK Government stated that £477 million had been set aside by BT for re-investment under contract clawback. The Government stated that there has been an additional £210 million in efficiency savings, and according to the press release, this means that "there will be up to £687 million available for local authorities to re-invest".<sup>37</sup>

The take-up of superfast broadband has generally been higher than anticipated when the contracts were designed, leading to higher than expected returns through the gainshare mechanisms.<sup>38</sup> The economic evaluation of the superfast broadband programme published in August 2018 (see below) concluded that the gainshare mechanism played a significant role in protecting the value for money associated with the programme.<sup>39</sup>

### 3.4 Commentary on the superfast broadband programme

#### Decision to use Fibre to the Cabinet technology

Under the programme, superfast broadband has been largely delivered using Fibre to the Cabinet (FTTC) technology. There has been some criticism of the use of FTTC rather than full-fibre networks to roll-out superfast broadband: FTTC provides lower speeds (<100 Mbps) than full-fibre (up to 1Gbps) and has been described as "not future proof".<sup>40</sup>

A result of this decision is that the UK has wide availability of superfast broadband, because FTTC could be rolled out more quickly and more cheaply than full-fibre.<sup>41</sup>

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<sup>36</sup> Ed Vaizey MP, [Oral evidence: Establishing World-class Connectivity throughout the UK, HC 407](#), 13 April 2016

<sup>37</sup> DCMS, [Superfast broadband now available to more than 19 out of 20 UK homes and businesses](#), 29 December 2017.

<sup>38</sup> DCMS, [Evaluation of the Economic Impact and Public Value of the Superfast Broadband Programme Final Report](#), August 2018 page 10.

<sup>39</sup> DCMS, [Evaluation of the Economic Impact and Public Value of the Superfast Broadband Programme Final Report](#), August 2018

<sup>40</sup> Arthur D Little, [European Telecom Operators Capex: the long march](#), 26 March 2014

<sup>41</sup> CMS Committee, [Establishing world-class connectivity throughout the UK](#), 19 July 2016, HC147 2016-17.

In its report [Establishing world-class connectivity throughout the UK](#), (19 July 2016), the House of Commons Culture, Media and Sport Select Committee (CMS Committee) stated that the progress made in the broadband roll-out since 2010 had shown that the BDUK scheme and the use of fibre-to-the-cabinet technology was, on balance, the right decision. However, the Committee went on to state that one consequence of this was that the programme appeared to have tackled easier to reach premises first:

One consequence of BDUK's and BT's rapid rollout is that the programme appears to have tackled the easier-to-reach premises first and has not delivered coverage to whole areas as such. This has left a patchwork of premises that have not been reached, and much uncertainty among local residents as to whether or not they will be connected or receive improved speeds and in turn has been compounded by repeated failure by BT to give accurate information on timing of deployment to consumers. Many counted as covered still appear unlikely to receive superfast speeds owing to the poor quality or length of the copper lines.<sup>42</sup>

The National Infrastructure Commission, in its July 2018 [National Infrastructure Assessment](#) made similar comments, describing the BDUK programme as "successful" but noted that it had not prioritised areas that were least likely to be delivered through private investment.<sup>43</sup>

### Competition concerns

Most contracts procured under the superfast broadband programme were signed by BT. In 2014 the House of Commons Public Accounts Select Committee criticised the procurement process under the programme for Phase 1 contracts (all of which were signed by BT), stating that the process failed to ensure meaningful competition.<sup>44</sup> The CMS Committee pointed to concerns about the transparency of BT's costs and deployment plans during Phase 1, which left many premises uncertain about when they would receive coverage, and discouraged other providers from investing.<sup>45</sup>

In December 2016, Matt Hancock, then Minister for Digital and Culture, told Parliament that for Phase 2, BDUK delivery was no longer solely via BT and that there were then six providers carrying out BDUK delivery.<sup>46</sup>

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<sup>42</sup> CMS Committee, [Establishing world-class connectivity throughout the UK](#), 19 July 2016, HC147 2016-17, para 33

<sup>43</sup> National Infrastructure Commission, [National Infrastructure Assessment](#), 10 July 2018.

<sup>44</sup> Public Accounts Committee, [The rural broadband programme](#), HC 834 2013-14, 1 April 2014.

<sup>45</sup> CMS Committee, [Establishing world-class connectivity throughout the UK](#), 19 July 2016, HC147 2016-17, paragraphs 32 and 34.

<sup>46</sup> HC Deb 15 December 2016 [c1060](#). These providers are reported to include Gigaclear and Call Flow; see: *ISPReview*, [Q3 2016 Take-up Figures for the BDUK Roll-out of Superfast Broadband](#), Mark Jackson, 22 December 2016, accessed 6 September 2018.



## How many premises have been reached under the programme?

DCMS reported that approximately 4.8 million premises in the UK had a superfast broadband service made available through BDUK-supported projects by the end of March 2018.<sup>47</sup> This represents about 17% of the total number of UK premises (as of January 2018).<sup>48</sup>

DCMS stated that 7,934 premises had been covered per £1 million of broadband delivery programme expenditure up to the end of March 2018. This represents an average of £126 per premises.<sup>49</sup> 200,000 premises have been connected to full-fibre networks under the programme.<sup>50</sup>

4.8 million premises (17% of total) have been reached by the programme.

This equates to 7,934 premises per £1 million funding and £126 per premises (on average).

## Economic impact of the superfast broadband programme

DCMS commissioned an evaluation of the economic and public value impacts of the superfast broadband programme. The [resulting report](#) was published in August 2018.<sup>51</sup> The evaluation estimated that overall, the programme delivered £1.96 benefit for every £1 of public sector investment (as of August 2018).

This was further broken down to an estimated £12.28 benefit for businesses for every £1 invested, leading to a total £9 billion increase in turnover for businesses benefitting from faster connections. The benefit-cost ratio for households was reported to be lower at £1.18 benefit for households for every £1 invested. The report stated that the lower benefit for households derived from the fact that households typically have less intensive broadband requirements than businesses. However, the report goes on to say that “much of the quality of life improvements associated with the programme are expected to arise in the future, and it is too early to make a judgement as to the relative costs and benefits of residential and non-residential deployment”.<sup>52</sup>

<sup>47</sup> DCMS, [Broadband Performance Indicator – March 2018](#) (24 May 2018).

<sup>48</sup> This was calculated by taking the number of premises reached by the BDUK programme (4,852,808 in March 2018 according to the [Broadband Performance Indicator](#)) as a percentage of the total number of premises (29,217,298, according to Ofcom’s [Connected Nations Spring Update 2018](#), published 30 April 2018 based on data collected in January 2018).

<sup>49</sup> DCMS, [Broadband Performance Indicator – March 2018](#) (24 May 2018). The actual cost per premises may vary widely depending on each particular case. The average figure was calculated based on reaching 7394 premises per £1 million funding.

<sup>50</sup> DCMS, [Future Telecoms Infrastructure Review](#), July 2018.

<sup>51</sup> DCMS, [Evaluation of the Economic Impact and Public Value of the Superfast Broadband Programme Final Report](#), Ipsos MORI, Simetrica, George Barrett and Dr. Pantelis Koutroumpis, August 2018.

<sup>52</sup> DCMS, [Evaluation of the Economic Impact and Public Value of the Superfast Broadband Programme Final Report](#), August 2018

## 4. Support for those without superfast broadband

### 4.1 Broadband Vouchers

The UK Government has two UK-wide broadband voucher schemes: the [Better Broadband Scheme](#) (usually for wireless connections) and the [gigabit voucher scheme](#) (usually for full-fibre connections for businesses).

The Welsh Government also has additional broadband voucher schemes – see Section 5.2 for more information.

#### Better Broadband Scheme

The [Better Broadband Scheme](#) is a UK-wide voucher scheme that provides subsidised connections for premises unable to receive connections of 2 Mbps download speeds. The subsidy of up to £350 is typically used to access a satellite or wireless broadband connection but may also be used to support community fibre projects (see Section 4.3).<sup>53</sup> The scheme has been running since 2015 and is due to close in December 2018.<sup>54</sup>

The Better Broadband Scheme provides vouchers up to £350 to premises unable to receive 2 Mbps download speed.

The Better Broadband Scheme forms part of the Government's commitment that every property in the UK should have access to broadband connections with 2 Mbps download speed.<sup>55</sup> As of January 2018, Ofcom reported that 0.5% of UK properties (155,000 premises) did not have access to 2 Mbps download speed.<sup>56</sup>

The Scheme is administered by local authorities or the devolved Administrations who provide a code to eligible homes and businesses upon request.<sup>57</sup> Premises are only eligible if there is no planned roll-out of superfast broadband to the premises within 6 to 12 months of the application.<sup>58</sup>

Further information and guidance, including a list of Better Broadband Scheme suppliers, is provided on Gov.uk: [Better Broadband Scheme Suppliers](#). A [postcode checker](#) is also available to find information about what is available in a particular area.

<sup>53</sup> DCMS, [Frequently Asked Questions - Better Broadband Subsidy Scheme](#), [accessed 30 November 2017, note the guidance has not been updated to reflect the DCMS announcement on 28 November that the scheme would be extended until December 2018]

<sup>54</sup> DCMS, [Better Broadband Scheme extended for another year](#), 28 November 2017.

<sup>55</sup> DCMS, [Satellite dishes to boost broadband speeds in most remote areas of UK](#), 7 December 2015 [accessed on 21 February 2017]

<sup>56</sup> Ofcom, [Connected Nations 2017](#), 15 December 2017.

<sup>57</sup> DCMS, [Satellite dishes to boost broadband speeds in most remote areas of UK](#), 7 December 2015 [accessed on 21 February 2017]

<sup>58</sup> DCMS, [Guide to the Better Broadband Subsidy Scheme](#), [accessed 30 November 2017, note the guidance has not been updated to reflect the DCMS announcement on 28 November that the scheme would be extended until December 2018].

When asked about further extensions to the programme, in July 2018, the Government said it “currently considering” how to effectively use voucher schemes to extend coverage, and that an “announcement will be made in due course”.<sup>59</sup> No announcement had been made at the time of publishing.

In 2015, the Government originally estimated that around 300,000 properties across the UK would be able to make use of the subsidy.<sup>60</sup> However, the scheme was reported to get off to a slow start,<sup>61</sup> a PQ response in January 2016 confirmed that the total value of installations ordered up to that date was £8,400 (out of the £60 million funding available to support the scheme).<sup>62</sup>

In November 2017, then Minister for Digital Culture Media and Sport, Matt Hancock, said that more than 10,000 homes and businesses had benefitted from the Scheme so far, and that the total value of the subsidies were worth over £3 million in total.<sup>63</sup>

## Gigabit broadband voucher scheme

The [gigabit voucher scheme](#) provides vouchers worth up to £2,500 to support the capital costs of installing a “gigabit capable connection” for small and medium sized businesses.<sup>64</sup> This means a connection that can support 1 Gbps (1000 Mbps) upload or download speeds, and usually means a full-fibre broadband connection.

Businesses can access the scheme individually or as a group. Residents can also apply for vouchers for up to £500 as part of a group project that includes businesses. The scheme is supplier-led, which means that suppliers request the vouchers on behalf of customers. To access the funding, businesses should approach a [registered supplier](#) operating in their area.<sup>65</sup> More information about the scheme and eligibility requirements is provided on the DCMS [gigabit voucher scheme](#) website.

The Scheme was launched UK-wide in March 2018.<sup>66</sup> For background information, see the Library briefing paper: [Full-fibre networks in the UK](#) (CBP8392, 3 September 2018).

The [gigabit voucher scheme](#) provides vouchers up to £2,500 to support the cost of installing a gigabit capable connection for small and medium sized businesses

<sup>59</sup> [HL955, 25 July 2018 \[Broadband: rural areas\]](#).

<sup>60</sup> DCMS, [Satellite dishes to boost broadband speeds in most remote areas of UK](#), 7 December 2015 [accessed 21 February 2017]

<sup>61</sup> ISP Review, [UK Rural Broadband Satellite Subsidy Scheme Gets Off to a Slow Start](#), 19 January 2016 [accessed 24 February 2017]

<sup>62</sup> [PQ 22495](#) [on Broadband: Rural Areas] 18 January 2016

<sup>63</sup> DCMS, [Better Broadband Scheme extended for another year](#), 28 November 2017.

<sup>64</sup> The Government defines a “gigabit capable” connection as one that can support 1 Gbps (1000 Mbps) download or upload speeds. The specifications are set out in the Gigabit Voucher Scheme [Supplier Registration Terms and Conditions & Application Requirements](#) document, 15 March 2018 [accessed 31 May 2018].

<sup>65</sup> DCMS’s [gigabit voucher scheme](#) website provides a list of [registered suppliers](#) and a postcode search function.

<sup>66</sup> DCMS, [Gigabit broadband voucher scheme](#), accessed 13 November 2018.

## 4.2 Universal service obligation (USO) for broadband (2020 onwards)

The Universal Service Obligation (USO) is the Government's main policy for delivering "decent broadband" connections to those properties that are not reached by the commercial or public funded roll-out of superfast broadband. It is expected to be implemented in 2020.

The USO is underpinned by legislation and will deliver a legal right to request a broadband connection of a minimum quality, up to a cost threshold (of installation) of £3400.<sup>67</sup> The minimum quality parameters are:

- 10 Mbps download speed;
- 1 Mbps upload speed; and
- medium response times (latency), a minimum data cap of 100 GBs and a contention rate of 50:1 (a maximum of 50 users to share one bandwidth).

The USO will be available to properties that do not have access to connections that meet the above quality parameters. To benefit from the USO, consumers will be required to register under the scheme to receive a connection, and a designated universal service provider will be required to provide it (subject to certain conditions).<sup>68</sup> The practical details for implementing the USO are still being arranged and consulted on by Ofcom.<sup>69</sup>

More information is available in the Library briefing paper [A Universal Service Obligation \(USO\) for Broadband](#).<sup>70</sup> Statistics about the number of premises eligible in each constituency can be found on the Library website: [Constituency data: broadband coverage and speeds](#) (November 2018).

The USO provides a legal right to request a connection with 10 Mbps download, 1 Mbps upload speeds.

It is expected to be available in 2020.

## 4.3 Community fibre partnerships

Communities who are not reached by commercial and public-funded programmes may consider developing a community-led project to bring fibre to their area – often called community fibre partnerships.<sup>71</sup>

Communities may consider a range of technologies and financing options, including buying into existing rollouts (either commercial or publicly funded); developing bespoke solutions; or building community owned and operated infrastructure.

While there is no direct Government support specifically for community fibre schemes, the voucher schemes explained above can be utilised and

<sup>67</sup> [Electronic Communications \(Broadband\) \(Universal Service\) Order 2018](#).

<sup>68</sup> DCMS, [Government's response to consultation on design of a new broadband Universal Service Obligation](#), 28 March 2018.

<sup>69</sup> Ofcom, [Implementing the broadband universal service obligation](#), 13 September 2018, accessed 8 November 2018.

<sup>70</sup> [A Universal Service Obligation \(USO\) for Broadband](#) (CBP-8146).

<sup>71</sup> DCMS, [Guidance Community-led broadband schemes](#), 21 October 2016

pooled together to support community programmes. DCMS has published [guidance](#) for communities on the Government's [Go Superfast Checker](#), including a set of [case studies](#). The case studies show several different funding and ownership models and include "major lesson(s) learnt" from each project. Some schemes are led by companies, for example, Broadband for the Rural North ([B4RN](#)).

Openreach also have a programme of [Community fibre partnerships](#) to establish fibre connections to groups of residents or businesses which are not currently covered by BDUK or commercial fibre plans. These partnerships will usually be jointly funded by Openreach and the community itself:

A community fibre partnership is when we work together with a local community (that is not in our commercial or BDUK fibre roll-out plans) to develop a solution to bring fibre to their community. There usually needs to be a joint funding arrangement, where we cover the costs in line with our commercial model used throughout the country and the community has the option to self-fund the remaining gap. We always look for solutions to be as affordable as possible.<sup>72</sup>

More information about Openreach's Community fibre partnerships, including FAQs and how to register is available on the [Community fibre partnerships webpages](#).

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<sup>72</sup> Openreach, [Community fibre partnerships](#), FAQs, [accessed 13 Feb 2017]



## 5. Superfast broadband in the devolved Administrations

### 5.1 Scotland

#### Summary

- The [Digital Scotland Superfast Broadband](#) programme is delivered by two separate projects: the [Highlands and Islands](#) programme and the [Rest of Scotland](#) programme. Contracts for the delivery of these projects were signed with BT in 2013.
- The Scottish Government has a target to deliver superfast broadband (30 Mbps download speeds) to 100% of properties in Scotland by 2021 under their “Reaching 100%” (R100) programme. The Scottish Government is conducting a second round of procurement to deliver infrastructure projects under the R100 programme, with building expected to commence in “early 2019”.
- The initial phase of the R100 programme has £600 million funding. This includes £21 million from the UK Government’s superfast broadband programme allocated in 2014 (as part of Phase 2 of that programme).
- The Scottish Government has indicated that the initial R100 procurement will not deliver 100% coverage and that a voucher scheme to deliver superfast broadband to remaining premises will follow.

#### Superfast broadband programme in Scotland

The [Digital Scotland Superfast Broadband](#) programme is delivered by two separate projects: the [Highlands and Islands](#) programme and the [Rest of Scotland](#) programme. Contracts were signed with BT for the delivery of these projects in 2013.

The Digital Scotland Superfast Broadband programme aimed to bring “fibre broadband” to 95% of Scottish premises by the end of 2017. Audit Scotland confirmed this target had been met.<sup>73</sup> Of this, 890,000 premises in Scotland were connected under the BT contracts,<sup>74</sup> which represents 34% of premises in Scotland.<sup>75</sup>

The overall investment in the projects is expected to be £442 million when the build concludes in September 2019.<sup>76</sup> This includes:

- £146 million private investment from BT
- £278 million from public sector sources (UK Government, Scottish Government, the EU, the Highlands and Islands Enterprise (HIE) and Scottish councils).

<sup>73</sup> Audit Scotland, [Superfast broadband for Scotland: further progress update](#), 20 September 2018, page 5.

<sup>74</sup> Audit Scotland, [Superfast broadband for Scotland: further progress update](#), 20 September 2018, page 8.

<sup>75</sup> Calculated based on a total of 2,633,579 premises in Scotland as of May 2018. Ofcom’s [Connected Nations update: October 2018](#), 2 October 2018.

<sup>76</sup> Audit Scotland, [Superfast broadband for Scotland: further progress update](#), 20 September 2018, page 10-11.

- £18 million additional income from higher than expected take-up (contract clawback).<sup>77</sup>

Of the public sector funding, the UK Government provided £108 million,<sup>78</sup> which was provided under Phase 1 of the superfast programme. Scotland was allocated a further £21 million by the UK Government as part of Phase 2.<sup>79</sup> This additional funding has not yet been contracted and will form part of the funding for the Scottish Government's "Reaching 100%" programme.

Detailed information about the breakdown of funding sources for each projects is provided in the [Audit Scotland broadband progress update report](#), published 20 September 2018.<sup>80</sup>

## Reaching 100% (R100)

A 'refreshed' [Digital Strategy for Scotland](#) was published by the Scottish Government in March 2017, which included a commitment to deliver superfast broadband (30 Mbps) to 100% of premises in Scotland by 2021.<sup>81</sup> The 100% superfast coverage target for Scotland [was part of the SNP manifesto](#) for the May 2016 Scottish Parliament Elections.<sup>82</sup>

The Scottish Government launched its "[Reaching 100% programme" \(R100\) in July 2017](#). In December 2017, the Scottish Government announced an overall investment of £600 million for the initial phase of the R100 programme.<sup>83</sup> <sup>84</sup> This included the £21 million from the UK Government's superfast broadband programme which was allocated in 2014 (Phase 2 of the programme) and £579 million provided by the Scottish Government.<sup>85</sup> <sup>86</sup>

The initial procurement under the R100 programme is divided into three lots (North, Central and South) and the first phase is expected to focus

The Scottish Government has a target to connect 100% of premises in Scotland with superfast broadband by 2021.

<sup>77</sup> Audit Scotland, [Superfast broadband for Scotland: further progress update](#), 20 September 2018, page 10-11

<sup>78</sup> £50 million to the Rest of Scotland project and £50.7 to Highland and Islands project

<sup>79</sup> [PQ HL5233, 9 March 2018 \[Broadband: Scotland\]](#).

<sup>80</sup> Audit Scotland, [Superfast broadband for Scotland: further progress update](#), 20 September 2018

<sup>81</sup> Scottish Government, [Realising Scotland's full potential in a digital world](#), 22 March 2017.

<sup>82</sup> SNP, [Manifesto 2016](#) [accessed on 10 June 2016]

<sup>83</sup> Scottish Government website: [Reaching 100% - Superfast Broadband for All](#), accessed 25 April 2018.

<sup>84</sup> Scottish Government press release, [£600 million for broadband](#), 14 December 2017.

<sup>85</sup> [Scottish Parliament, 30 November 2017, First Minister's question time, question 4](#); Department of Digital Culture Media and Sport written evidence to Scottish Affairs Committee, [DCS0104](#), paragraph 6.

<sup>86</sup> [Letter](#) from Cabinet Secretary for the Rural Economy and Connectivity, Fergus Ewing, to the Chair of the Commons Scottish Affairs Committee, 3 May 2018.

on rural Scotland, targeting an intervention area of 226,933 premises.<sup>87 88</sup> Contracts are expected to be awarded in early 2019.<sup>89</sup>

The Scottish Government has indicated that a superfast broadband voucher scheme would follow in 2019 to extend superfast broadband to premises not reached by the procurement:

Though we expect this initial procurement to extend access to the vast majority of premises, bringing accessible fibre far closer to our most remote rural areas, additional measures will likely still be needed to provide superfast access to some of those areas. Key to this will be a superfast voucher scheme that will deliver a wide range of superfast technologies including fixed wireless, 4G mobile, superfast satellite as well as emerging technologies such as TV White Space. More details on the scheme will follow during 2019.<sup>90</sup>

In September 2018, Audit Scotland concluded that “further investment may be required to reach all premises” and that “it will be difficult for the Scottish Government to deliver its ambitions by the end of 2021”. It recommended that the Scottish Government:

develop and publish an overall strategy for delivering its world-class vision which includes mapping out and monitoring existing and future digital infrastructure activities, and a realistic timetable with targets for delivery.<sup>91</sup>

### Progress on roll-out in Scotland

As of May 2018, Ofcom reported that 91.5% of premises in Scotland had access to superfast broadband based on Ofcom’s and the Scottish Government’s definition of 30 Mbps download speeds.

Progress on superfast broadband targets in Scotland has been subject to political comment. For example, Matt Hancock, the UK Government’s then Digital Minister, commented in September 2017 that Scotland’s progress on the roll-out of superfast broadband was behind the rest of the UK:

... The Scottish Government have been the slowest of all of the different organisations around the country to contract the broadband that we so desperately need. That is why Scotland is behind. We are offering technical support, but they are behind every English county and behind both the Welsh Government and Northern Ireland Government, and they need to get a move on.<sup>92</sup>

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<sup>87</sup> Scottish Government, [Reaching 100% – Superfast Broadband for All](#), December 2017.

<sup>88</sup> Scottish Government, [Digital Scotland – Reaching 100% Programme Public Consultation Report](#), May 2018.

<sup>89</sup> Audit Scotland, [Superfast broadband for Scotland: further progress update](#), 20 September 2018, page 5.

<sup>90</sup> Scottish Government, [Reaching 100% – Superfast Broadband for All](#), December 2017.

<sup>91</sup> Audit Scotland, [Superfast broadband for Scotland: further progress update](#), 20 September 2018, page 5-6.

<sup>92</sup> [Written Question 7140](#), 12 September 2017

In October 2017, the Scottish Government's Cabinet Secretary for Rural Economy and Connectivity, Fergus Ewing, stated that progress in Scotland in 2016 was faster than any other part of the UK:

Last year we made faster progress than any other part of the UK and we are on-track to meet our Programme for Government commitment of 95% coverage by the end of this year. [...]

I am not complacent - I am aware that those who do not have access are at a disadvantage and our job is not done until everyone is connected. We are now focussing on the next steps to achieve 100% coverage by 2021.<sup>93</sup>

Scottish Conservative MP John Lamont was critical of the Scottish Government's coordination of the superfast broadband delivery, during a Westminster Hall debate in November 2017.<sup>94</sup> During that debate the then UK Digital Minister Matt Hancock stated that UK Government funding for full-fibre networks would go directly to local authorities in Scotland rather than the Scottish Government:

It is a great cause for regret that the Scottish Government have for more than three years sat on £20 million of UK taxpayers' money, which could have been used to deliver broadband for the people of Scotland. [...]

As a result of our experience of delivering superfast broadband through the Scottish Government thus far, we have decided that for the next generation of broadband technology—full fibre—we will instead deal directly with local authorities across Scotland, as we do in England.<sup>95</sup>

In response, SNP MPs highlighted the investments made by the Scottish Government, arguing that the UK Government targets were “skewed towards England” and that Scotland should have received more funding due to Scotland's challenging geography.<sup>96</sup> The Scottish Government also argues that it took a different approach to delivery than local bodies in England, which meant they could not use the Phase 2 funding earlier.<sup>97</sup>

Scotland's Digital Minister, Fergus Ewing, stated in a debate in the Scottish Parliament in May 2018 that broadband coverage in Scotland had “caught up dramatically” with the rest of the UK:

It is important to acknowledge that Scotland traditionally lagged behind the rest of the United Kingdom in broadband coverage. Overcoming the challenge of our geography and rurality required that we take a different approach. That is what the digital Scotland superfast broadband programme has delivered. [...]

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<sup>93</sup> Scottish Government, [Broadband coverage extended](#), 22 October 2017.

<sup>94</sup> [HC Deb, 22 November 2017, c380WH](#).

<sup>95</sup> [HC Deb, 22 November 2017, c404WH](#). Also see [PO115647, 6 December 2017](#). For more information about funding for full-fibre networks, see the Library briefing paper: [Full-fibre networks in the UK](#) (CBP8392, 3 September 2018).

<sup>96</sup> [HC Deb, 22 November 2017, c390WH](#).

<sup>97</sup> See: Scottish Affairs Committee, [Digital Connectivity in Scotland](#), Fifth Report of Session 2017-19, 23 July 2018, para 29.

[...]

On top of that, thinkbroadband's data, which purports to give a more up-to-date view of coverage, shows that superfast coverage in Scotland is now above 93 per cent, which is within two percentage points of the overall UK total. That gap, which was 10 per cent in 2014 and around 19 per cent in 2012, has reduced to just 2 percentage points.<sup>98</sup>

In its report [Digital Connectivity in Scotland](#), published on 23 July 2018, the House of Commons Scottish Affairs Select Committee elaborated on what the Committee described as the "intense disagreement between the UK and Scottish Governments about the rollout of broadband in Scotland". While the Committee acknowledged that UK and Scottish ministers recognised that the relationship needed to improve, it urged ministers to put past disagreements behind them and find a way to effectively work together.<sup>99</sup> The UK Government accepted the Committee's recommendation.<sup>100</sup>

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<sup>98</sup> [Meeting of the Scottish Parliament, 3 May 2018, Motion S5M-12010.](#)

<sup>99</sup> Scottish Affairs Committee, [Digital Connectivity in Scotland](#), Fifth Report of Session 2017-19, 23 July 2018.

<sup>100</sup> Scottish Affairs Committee, 4<sup>th</sup> Special Report, [Government response to Committee's 5<sup>th</sup> report](#), HC1612, 12 October 2018, paragraph 5.



## 5.2 Wales

### Summary

- The Welsh Government defines superfast broadband as download speeds of 30 Mbps.
- [Superfast Cymru](#) is the Welsh Government's delivery body for its superfast broadband programme. The first phase of the Superfast Cymru project finished in February 2018.
- The National Assembly for Wales Economy Infrastructure and Skills Committee [concluded](#) in September 2017 that the Superfast Cymru project had generally been delivered adequately in terms of the roll-out of infrastructure, but that the main criticism levelled at the programme was the communication of progress to the public.
- The Welsh Government is now working on the successor to the Superfast Cymru project, which is underpinned by £80 million of public funds. The funding is drawn from the EU, UK and Welsh Governments and includes gainshare returns from the original Superfast Cymru contracts.
- In addition to UK-wide voucher schemes, the Welsh Government has two voucher schemes to support homes and businesses that are not reached by the Superfast Cymru project or its successor project:
  - The [Access Broadband Cymru](#) scheme provides vouchers up to £800 to support getting a connection that delivers "a step change in speed" (up to 30 Mbps).
  - [Ultrafast Connectivity Vouchers](#) provides support for businesses to fund or part-fund the cost of installing an "ultrafast" broadband service.

### Superfast Cymru

[Superfast Cymru](#) is the Welsh Government's delivery body for its superfast broadband programme.

In July 2012, the Welsh Government signed an agreement with BT Openreach for the provision of access to superfast broadband infrastructure for 95% of the premises (691,000 premises) in a defined intervention area (the area identified as requiring state support).<sup>101</sup> The agreement stated that:

- a minimum of 95% of all premises in the intervention area should be capable of having access to speeds of at least 24 Mbps;
- a minimum of 90% of all premises in the intervention area should be capable of having access to speeds of at least 30 Mbps;
- a minimum of 40% of all premises in the intervention area should be capable of having access to speeds of at least 100 Mbps.<sup>102</sup>

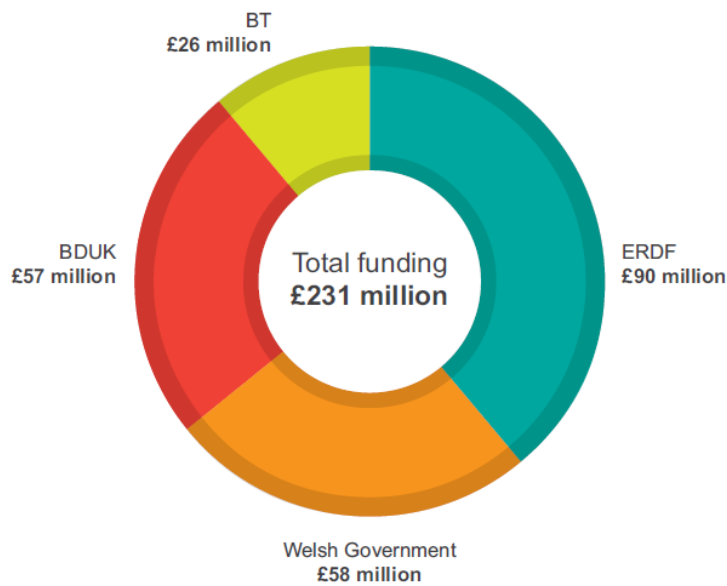
Below is a chart from a 2015 Welsh Audit Office report which detailed that the Superfast Cymru contract was worth £231 million with BT contributing £26 million of capital funding.<sup>103</sup>

<sup>101</sup> Welsh Audit Office, [Welsh Government investment in next generation broadband infrastructure](#), 28 May 2015.

<sup>102</sup> Welsh Audit Office, [Welsh Government investment in next generation broadband infrastructure](#), 28 May 2015.

<sup>103</sup> The European Regional Development Fund (ERDF) is part of EU regional development funding.

Figure 2 – Funding capital contributions for the Superfast Cymru contract



Source: [Welsh Audit Office](#)<sup>104</sup>

In July 2015 the Welsh Government signed an additional agreement with BT to provide coverage to a further 42,000 premises by June 2017. An agreement was also signed with the fixed wireless provider Airband to provide coverage to 2,000 premises in business parks and industrial estates across Wales by summer 2016.<sup>105</sup>

The delivery phase for Superfast Cymru closed in February 2018. In October 2018, Welsh Minister for Digital, Julie James, told the Welsh Assembly that the Superfast Cymru project had delivered superfast broadband access to “nearly 733,000 premises”.<sup>106</sup> This represents approximately 50% of premises in Wales.<sup>107</sup>

In its September 2017 report on [Digital Infrastructure in Wales](#), the National Assembly for Wales Economy Infrastructure and Skills Committee concluded that the Superfast Cymru project had generally been delivered adequately in terms of the roll-out of infrastructure, but that the main criticism levelled at the programme was the communication of progress to the public. The Committee concluded that the Welsh Government and BT could have done more to raise awareness of the programme and the benefits of superfast broadband,

<sup>104</sup> Welsh Audit Office, [Welsh Government investment in next generation broadband infrastructure](#), 28 May 2015.

<sup>105</sup> ‘[Wales UK Signs Deal to Expand BT Fibre Broadband Services to More Areas](#)’, *ISPreview*, 7 July 2015 [accessed on 10 June 2016]

<sup>106</sup> The evaluation of tenders for lot two covering east Wales was said to be “ongoing”. National Assembly for Wales, [Statement by the Leader of the House and Chief Whip: Broadband Update](#), 23 October 2018, para 258.

<sup>107</sup> Calculated based on a total of 1,455,849 premises in Wales as of May 2018. Ofcom’s [Connected Nations update: October 2018](#), 2 October 2018.

which might have led to higher take up rates.<sup>108</sup> The Welsh Government accepted this conclusion and stated that it would “consider including specific performance measures on communicating with the public in the grant agreement or contract for the Superfast Cymru successor scheme”.<sup>109</sup>

## Superfast Cymru successor project

The Welsh Government’s “[Taking Wales Forward](#)” Programme for Government 2016-2021 states a commitment to “bring people together digitally by offering fast reliable broadband to every property in Wales”.<sup>110</sup> To deliver this commitment the Welsh Government has begun procurement for a successor to the Superfast Cymru delivery body which will target premises that would not be served over the next three years without Government intervention. The procurement will target 88,000 premises with “an emphasis on rural delivery, business prioritisation and ultrafast 100 Mbps services”.<sup>111 112</sup>

The project is underpinned by £80 million of public funds, which is a mixture of funding from the EU, UK and Welsh Governments and includes funding drawn from gainshare returns from the original Superfast Cymru contracts..<sup>113 114</sup> The new procurement phase has been allocated £62.5 million of the £80 million funding available; the remainder will be used for “community programmes” (see below).<sup>115</sup>

The procurement process for the Superfast Cymru successor project was divided into three lots: north Wales (lot one), east Wales (lot 2) and south-west and the Valleys (lot three). On 23 October 2018 the Welsh Government announced that BT was the successful bidder for lots one and three.<sup>116</sup> Minister for Digital, Julie James, told the Welsh Assembly that under those contracts the “vast majority” of premises will be served by a full-fibre connection, including all premises in lot three.<sup>117</sup>

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<sup>108</sup> National Assembly for Wales, Economy Infrastructure and Skills Committee, [Digital Infrastructure in Wales](#), September 2017, para 23.

<sup>109</sup> Welsh Government, [Response to the Economy, Infrastructure and Skills Committee report into Digital Infrastructure in Wales](#), September 2017.

<sup>110</sup> Welsh Government, [Taking Wales Forward 2016-2021](#), 19 September 2017, accessed 7 September 2018.

<sup>111</sup> National Assembly for Wales, [Statement by the Leader of the House: Superfast Cymru](#), 30 January 2018, para 281.

<sup>112</sup> National Assembly for Wales, [Statement by the Leader of the House: Superfast Cymru](#), 30 January 2018, at paragraph 318.

<sup>113</sup> Welsh Government, [Written Statement - Further investment in broadband](#), 7 November 2016.

<sup>114</sup> National Assembly for Wales, [Statement by the Leader of the House: Superfast Cymru](#), 30 January 2018, para 332.

<sup>115</sup> National Assembly for Wales, [Statement by the Leader of the House: Update on Digital Connectivity in Wales](#), 15 May 2018, para 458 and 474.

<sup>116</sup> The evaluation of tenders for lot two covering east Wales was said to be “ongoing”. National Assembly for Wales, [Statement by the Leader of the House and Chief Whip: Broadband Update](#), 23 October 2018, para 262.

<sup>117</sup> National Assembly for Wales, [Statement by the Leader of the House and Chief Whip: Broadband Update](#), 23 October 2018, para 262.

The Welsh Government has said that a “novel” scheme to support communities that will not be reached by the successor Superfast Cymru contracts and for whom a voucher scheme may not be appropriate would also be introduced. The scheme was announced in January 2018 with the following details:

We also plan to introduce an additional, novel scheme that supports communities demonstrating tangible demand, particularly targeting those communities that are not covered by suppliers in their response to the ITT. We are seeking to establish a broadband outreach team to support this approach and to work with clusters of homes or businesses to harness this demand, define a local project, and procure a solution. There is much work to be done on this approach, but I will provide more detail in due course.<sup>118</sup>

In October 2018 the Minister stated that details of the “novel scheme” for communities would follow once the procurement for the Superfast Cymru successor project had been completed.<sup>119</sup>

Regarding the communication problems that had faced the previous Superfast Cymru projects, the Welsh Minister stated that the new contract would specify which premises would be within the scope of the contracts, which would allow a communications policy to be put in place and timescales for delivery to be monitored.<sup>120</sup>

I absolutely accept the points about comms that absolutely everybody has made. That's partly occurred because of the way we did the first contract, which was an all-Wales contract. We only specified the number of premises, I didn't specify where they should be, who they should be...

In this new contract, we are asking them to specify the premises, so they will be telling us exactly where they're going and how, and then we will have timescales, and they will be monitored.<sup>121</sup>

## Voucher schemes in Wales

The Welsh Government has two voucher schemes to support homes and businesses that are not reached by the Superfast Cymru project or its successor project:

- 1 The [Access Broadband Cymru](#) (“ABC”) voucher scheme provides up to £800 to support the installation of new connections that provide “a step change in speed”, which means at least double the existing speed (up to 30 Mbps).<sup>122</sup>
- 2 [Ultrafast Connectivity Vouchers](#) provides support for businesses to fund (or part-fund) the cost of installing an “ultrafast” service (up

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<sup>118</sup> National Assembly for Wales, [Statement by the Leader of the House: Superfast Cymru](#), 30 January 2018, para 285.

<sup>119</sup> National Assembly for Wales, [Statement by the Leader of the House and Chief Whip: Broadband Update](#), 23 October 2018, para 267.

<sup>120</sup> National Assembly for Wales, [Statement by the Leader of the House: Update on Digital Connectivity in Wales](#), 15 May 2018 at paragraphs 482, 496 and 516.

<sup>121</sup> National Assembly for Wales, [Statement by the Leader of the House: Superfast Cymru](#), 30 January 2018, para 318-319.

<sup>122</sup> Welsh Government, [Not available? Get help](#) [accessed on 30 May 2018]

to 100 Mbps download, 30 Mbps upload). The Welsh Government will contribute up to £10,000, where the first £3000 of eligible costs are 100% funded by the Welsh Government and 50% funding provided for costs between £3000 and £17,000.<sup>123</sup>

In [written evidence](#) to the Economy Infrastructure and Skills Committee in September 2017 the Welsh Government stated that 128 offers had been approved and installed under the ABC scheme since January 2016 and 8 applications had been approved under the Ultrafast Connectivity scheme.<sup>124</sup>

Telecommunications news website *ISP Review* in January 2017 commented on the take-up of the vouchers schemes, suggesting that the ultrafast connectivity scheme was perhaps not attractive to many businesses due to the high cost of the technology options that the programme funds, and that the advertising of the scheme could be better.<sup>125</sup>

The Welsh Government confirmed in October 2018 that the voucher projects would continue but that the schemes were being reviewed to ensure their ongoing relevance. In particular, a review of the ultrafast connectivity voucher was flagged in light of the UK-wide gigabit voucher scheme that was announced by DCMS in April 2018 (see Section 4.2).<sup>126</sup>

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<sup>123</sup> Welsh Government, [Superfast broadband for businesses](#) [accessed 30 May 2018]

<sup>124</sup> Welsh Government, [Written Evidence to the Economy, Infrastructure and Skills Committee Digital Infrastructure Inquiry](#), 2017.

<sup>125</sup> [Changes Coming for Struggling Broadband Voucher Schemes in Wales](#), *ISP Review*, 30 January 2017.

<sup>126</sup> National Assembly for Wales, [Statement by the Leader of the House: Update on Digital Connectivity in Wales](#), 15 May 2018, para 460.

## 5.3 Northern Ireland

### Summary

- [Superfast Northern Ireland](#) is the Northern Ireland delivery body for the Superfast Rollout Programme. In March 2018 the UK Government said that the project was due to finish that month providing coverage to 41,000 premises. As of 24 September 2018, BDUK's [table of local broadband projects](#) showed the Northern Ireland programme as "in delivery".
- As part of the agreement between the Conservative party and the Democratic Unionist party (DUP) following the June 2017 general election, the UK Government allocated a further £150 million to support "ultrafast broadband" roll-out in Northern Ireland. As of September 2018, details for how the funding will be used had not been announced.

### Superfast Northern Ireland

[Superfast Northern Ireland](#) is the Northern Ireland delivery body for the Superfast Rollout Programme.

The [Northern Ireland Broadband Improvement Project](#) (NIBIP) was a Phase 1 project to provide increased or improved broadband services in certain areas. It ran from February 2014 to December 2015. The UK Government provided £4.4 million through BDUK.<sup>127</sup>

The [Superfast Rollout Programme](#) (Phase 2) aimed to provide superfast broadband to over 38,000 premises in areas where the choice was poor or broadband speeds were low. Some of these were in rural and remote parts of Northern Ireland. This Phase 2 project started in February 2015 and was allocated £17 million in total from the Northern Ireland Department for the Economy, BDUK and BT; of this, BDUK provided £7.2 million.<sup>128</sup> More details and information is available in the Department for Economy [FAQs](#) about the project.<sup>129</sup>

In March 2018, UK Digital Minister, Margot James, stated that the Superfast Northern Ireland project was due to finish that month, providing coverage to 41,000 premises.<sup>130</sup> As of 24 September 2018, BDUK's [table of local broadband projects](#) showed the Northern Ireland programme as "in delivery".<sup>131</sup>

### Ultrafast broadband in Northern Ireland

As part of the agreement between the Conservative party and the Democratic Unionist party (DUP) following the June 2017 general election, the UK Government allocated a further £150 million to support "ultrafast broadband" roll-out in Northern Ireland.<sup>132</sup> The then Cabinet Office Minister, Damian Green, explained to the House of Commons on

<sup>127</sup> BDUK, [BDUK: Table of local broadband projects](#), Accessed online: 7 October 2015

<sup>128</sup> Northern Ireland Department for the Economy, [Superfast Rollout Programme](#) [accessed 28 February 2017] ; see also: '[N.Ireland Secures Another GBP17m to Extend Superfast Broadband](#)', *ISPreview*, 2 March 2015

<sup>129</sup> Northern Ireland Department for the Economy, [Superfast rollout programme – Phase 2 FAQs](#), 14 June 2016 [accessed 28 February 2017]

<sup>130</sup> [Broadband: Northern Ireland](#), WPO 130625, 8 Mar 2018.

<sup>131</sup> DCMS, BDUK [table of local broadband projects](#) as of 17 August 2018 [accessed 7 September 2018].

<sup>132</sup> [HC Deb 626, 26 June 2017](#).



26 June 2017 that £75 million a year for two years would be allocated for help provide ultrafast broadband in Northern Ireland, drawn from a pot of £200 million a year provided for infrastructure:

The Government support further co-operation with the Northern Ireland Executive on infrastructure development in Northern Ireland. The UK Government will allocate £200 million a year for two years. The Government and previous Executives have recognised the integral part digital infrastructure plays in opening up new opportunities for growth and connectivity for businesses and consumers. We will therefore contribute £75 million a year for two years to help provide ultrafast broadband for Northern Ireland, just as we have made funding available for this purpose in communities across the United Kingdom.<sup>133</sup>

In April 2018 the BBC reported that UK Digital Minister Margot James had raised concerns about whether the £150 million funding would be used within the two year period, due to the need to plan a project for delivery and procure contracts before building can begin.<sup>134</sup> Later the same month the BBC reported that the NI Department for the Economy stated that “preparation was underway”, that political and industry stakeholders were to be consulted and with a procurement process to follow “potentially” later this year.<sup>135</sup>

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<sup>133</sup> [HC Deb 626, 26 June 2017, c329.](#)

<sup>134</sup> BBC News, [Minister's concern over Northern Ireland broadband project](#), 15 April 2018

<sup>135</sup> BBC News, [Political parties to be consulted on NI broadband plan](#), 25 April 2018

## 6. Glossary

### Broadband speeds

#### Megabits and megabytes

Megabits (Mb) and megabytes (MB) are units for expressing a quantity or amount of data. 8 megabits (Mb) is equal to 1 megabyte (MB); 8 gigabits is equal to 1 gigabyte (GB).

Broadband speeds are expressed as an amount of data downloaded per second, usually in megabits per second (Mbps).

#### Decent broadband

Ofcom defines a “decent” broadband as a connection capable of delivering a download speed of at least 10 Mbps and an upload speed of at least 1 Mbps.<sup>136</sup> This is the specification for the Government’s Universal Service Obligation (expected to be available in 2020).

#### Superfast broadband

Superfast broadband does not have a single definition. The UK Government defines it as speeds greater than 24Mbps, whereas Ofcom and the European Commission define it as speeds greater than 30Mbps. The Scottish and Welsh Governments also use the higher definition.

#### Ultrafast broadband

Ultrafast broadband does not have a single definition. The UK Government defines it as speeds of 100Mbps and higher, whereas Ofcom defines it as speeds greater than 300Mbps.

#### Gigabit-capable connection

The UK Government defines a “gigabit capable” connection as one that can support 1 gigabit per second (Gbps) download or upload speeds. 1 Gbps is equal to 1000 Mbps.

### Broadband technologies

#### ADSL

ADSL (asymmetric digital subscriber line) technology delivers broadband using copper telephone lines—the connection speed will depend on which type of ADSL is being used; and the quality and length of the line from the telephone exchange to the premises. The further away from the telephone exchange, the slower the connection.

#### Fibre optic cable

Fibre optic cables are made of glass or plastic. They transmit data using light. Therefore, the signal travels much faster and the signal does not degrade with distance in the same way that copper wires do.

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<sup>136</sup> Ofcom, [Connected Nations 2017](#), December 2017.

### **Fibre to the Cabinet (FTTC)**

Fibre to the Cabinet (FTTC) is the main technology used for superfast broadband roll-out in the UK. FTTC connections use fibre optic cables to carry the signal from the telephone exchange to street cabinets and then existing copper lines are used from the cabinet to premises.

FTTC technology can provide speeds of up to 80 Mbps. However, the maximum speed that a premises can receive reduces the further away it is from a cabinet, with superfast speeds (above 24 Mbps) available up to approximately 1000m from the cabinet.

For more detailed information, see the POST briefing on [Telecommunications Infrastructure](#) (24 March 2017).

### **G-fast**

G-fast is a broadband technology being deployed in a pilot commercial roll-out by [Openreach](#).<sup>137</sup> G-fast is a variant of FTTC technology, which allows ultrafast speeds (up to 300 Mbps) to be delivered using the same copper telephone lines that are used in FTTC technology.<sup>138</sup> It works by expanding the frequency range over which signals are transmitted, allowing for higher speeds.<sup>139</sup> Higher frequencies slow sharply with distance however so only premises within 350 meters of the cabinet are expected to benefit. G-fast is installed by fitting an 'extension pod' onto existing cabinets, and therefore can be installed quickly at low cost.

### **Cable Broadband**

Most cable broadband in the UK is provided by Virgin Media. Cable networks use a combination of fibre optic cables to street cabinets and high-grade co-axial cables (which are also used for cable TV) from the cabinets to premises. Co-axial cables are not affected by signal loss over distance in the same way that copper wires are. The latest standard DOCSIS3.1 allows for speeds of around 1 Gbps (1000 Mbps) by cable.

### **Full-fibre [Fibre to the Premises or Home (FTTP/FTTH)]**

Fibre to the Premises (FTTP) or Fibre to the Home (FTTH) is a technology where the fibre optic cable runs all the way to the premises or home. This means that there is no change in speed based on distance from the exchange. FTTP/FTTH can provide download speeds of 1 Gbps (1000 Mbps). This is also referred to by the Government as full-fibre.

More information is provided in the Library briefing paper: [Full-fibre networks in the UK](#) (CBP8392, 3 September 2018)

### **Fixed Wireless**

Fixed Wireless uses specific frequencies of the radio spectrum to transmit signals through the air in a similar way to mobile phone networks, doing away with wires. Depending on the number of users

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<sup>137</sup> Openreach, [Ultrafast fibre – G-fast](#), accessed 7 September 2017.

<sup>138</sup> Openreach, [Ultrafast fibre – G-fast](#), accessed 7 September 2017.

<sup>139</sup> [Is G.fast the answer to the UK's fibre vs copper debate?](#), *Computer Weekly*, 22 October 2015; [Openreach Extend 330Mbps G.fast Broadband Pilot to 1 Million UK Premises](#), *ISP Review*, 17 August 2017.

served by the wireless connection, it is capable of delivering superfast speeds. Most wireless ISPs only offer limited coverage in specific areas, for example rural villages.

### **Satellite broadband**

Satellite broadband is an option for those who live in rural areas where traditional fixed-line based broadband services aren't available. It uses a satellite dish to provide access to broadband services. The main advantage of satellite broadband is that it can be provided virtually anywhere in the world, as long as there is a clear line of sight to the satellite (south for the UK).

### **Next-Generation Access (NGA) Broadband**

The EU uses the terminology “next-generation access broadband”. The EU defines NGA broadband to be networks that consist wholly or in part of optical fibre cables that are capable of delivering broadband with enhanced characteristics compared to already existing copper networks.

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