Communications Infrastructure Report 2011

Fixed broadband data

Report

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Contents

Section 1

Introduction

Background

1.1   The Digital Economy Act 2010 gave Ofcom a new duty to report to the Secretary of State for Culture, Media and Sport every three years on the state of the UK's communications infrastructure. The first report is due later this year.

1.2   The first report will include information on the networks and services used by the majority of UK consumers. These include voice and data services carried over fixed and mobile networks as well as digital TV and radio broadcasts.

1.3   Government has placed particular importance on the availability and take up of broadband services. In a speech on 12 May 2011 Jeremy Hunt, the Secretary of State for Culture, Media and Sport, outlined government's ambitions to provide all homes and businesses in the UK with access to at least 2Mbit/s broadband and that superfast broadband[1] should be available to 90 per cent of people in each local authority area.

1.4   The government has allocated £530m to assist in providing the UK with the best superfast broadband network in Europe by 2015 and is encouraging local authorities to develop their own broadband plans setting out how superfast broadband access will be rolled-out in their area. Local authorities will be able to apply for a share of the £530m.

1.5   Due to the importance placed on this matter, the Secretary of State has requested that Ofcom bring forward the publication of the data relating to fixed broadband networks and services that we were compiling for the Infrastructure Report. This data will be valuable to local authorities in developing their broadband plans and will thereby help accelerate the rate at which the benefits of improved broadband infrastructure can be delivered to UK citizens and consumers.

1.6   This report includes the data that the Secretary of State has requested and will form part of the main Infrastructure Report. Further information on next steps is provided in section 3.

Update to original report

1.7   This report is an update to the original report published on 6 July 2011. It reflects new data that was submitted by Kingston Communications to Ofcom after the original publication date and reflects recent upgrades that had been made to Kingston Communications network in the City of Hull and the East Riding of Yorkshire.

1.8   This new data has resulted in average modem sync speed increasing (from 6.4 to 7.3Mbit/s in the City of Hull and 6.4 to 6.9 Mbit/s in the East Riding of Yorkshire) and the percentage of customers receiving less than 2 Mbit/s reducing (from 9.7% to 7.2% in the City of Hull and 14.8% to 13.6% in the East Riding of Yorkshire).

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[1] Superfast broadband services are generally considered to be those that run at over 24Mbit/s.

Scope of report

1.9   This report provides data on various aspects of broadband services delivered over fixed telecoms networks.

1.10   The large majority of broadband services in the UK are provided using either telephone lines maintained by Openreach (part of the BT Group) or via Virgin Media's cable network. However, this report also includes data from Kingston Communications which is the sole operator of the telephony network in Hull, Wight Cable which operates cable services on the Isle of Wight and Digital Region which has built a superfast broadband network in South Yorkshire. There are a number of other companies already providing superfast broadband in different parts of the UK, but these have not been included in the analysis as their current scale is unlikely to have a significant impact on the overall results.[2]

1.11   In addition to collecting data from the infrastructure providers, we have also analysed data from the leading retail Internet Service Providers (ISPs) to ascertain average broadband speeds and assess the percentage of consumers currently not receiving broadband at speeds of 2Mbit/s or more.

1.12   This report does not consider broadband delivered using wireless technologies, nor does it consider high speed data connections provided primarily to business customers using traditional 'leased lines'.

1.13   The report includes four metrics which are important indicators of the state of broadband throughout the UK:

Broadband take-up	The number of existing broadband connections as a proportion of residential and non-residential addresses.
Average modem sync speed	The average maximum speeds of the existing broadband connections
Superfast availability	The percentage of addresses which are within the coverage area of superfast broadband networks
Receiving less than 2Mbit/s	The percentage of existing broadband connections currently not achieving 2Mbit/s downstream speeds.

1.14   Data on superfast broadband take-up has not been included in the above metrics. Latest published figures from Virgin Media[3] and BT[4] suggest there are fewer than 500k subscribers to superfast broadband across the UK, equating to fewer than 3% of broadband homes. Due to the current low take-up and commercial sensitivity of the number and location of these subscribers we have chosen not to include superfast broadband take-up in this report. As take-up of superfast broadband increases we will seek to include this data in future reports.

1.15   Data is provided for each "tier 1" local authority. This is the level at which the government expects most local broadband plans to be developed.[5] Terminology

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[2] See http://stakeholders.ofcom.org.uk/binaries/telecoms/policy/local-fibre-access.pdf for details of regional superfast broadband projects

[3] 150k subscriber to the up to 50 Mbit/s service announced in Q1 2011 results

[4] 144k subscribers to BT Infinity announced in Q4 2011 results

[5] Broadband plans for Northern Ireland, Wales and Scotland may be developed by the devolved Governments.

varies among the different countries making up the UK, but broadly speaking the areas relate to English Metropolitan and Non-Metropolitan Counties, Unitary Authorities, Metropolitan Districts and Council Areas.[6] In total we are reporting on 200 different administrative authority areas.

1.16 It should be noted that the data will primarily be of interest to local authorities in developing their local broadband plans. Because broadband availability and speeds can vary significantly over relatively small geographic areas the granularity of the data presented in this report will be of limited value to consumers in making purchasing decisions. Ofcom has previously published consumer guides on choosing a broadband service[7] and most Internet Service Providers (ISPs) provide information on their websites on availability of products in different geographic areas along with estimates of broadband speeds available at individual addresses.

Methodology

1.17 The methodology by which the data has been compiled has been developed with two key objectives:

i) To provide a robust dataset that allows broadband to be compared in different parts of the UK; and

ii) To use an easily repeatable methodology which will allow the analysis to be undertaken on a regular basis to allow changes in broadband to be tracked over the coming years.

1.18 This report assumes the reader is reasonably familiar with the different technologies used to deliver broadband over fixed lines. Further background information on broadband technologies and the factors that affect their performance can be found in Section 10 of our most recent UK fixed broadband speeds research published in March 2011.[8]

1.19 Details of the methodology are provided in Annex 2. However, there are a number of important points to note.

- Our **broadband take-up** figure represents the number of non-superfast fixed broadband connections as a percentage of residential and non-residential addresses in the area. It does not include superfast broadband connections or broadband delivered over mobile, wireless or satellite. For these reasons, this metric is not directly comparable with broadband take up figures we have published in previous reports and which are based on the results of consumer surveys.

- The 'modem sync speed' is the maximum rate at which data is transferred from the ISP to the end users across their broadband connection. We have calculated the **average modem sync speed** in each area for services delivered over telephone lines and cable connections.[9] However, the measure will not always

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[6] See http://www.statistics.gov.uk/geography/admin_geog.asp for more information on administrative geographic areas

[7] See http://consumers.ofcom.org.uk/files/2009/07/bbchoice.pdf

[8] See section 10 of http://stakeholders.ofcom.org.uk/binaries/research/telecoms-research/bbspeeds2011/bb-speeds-nov-2010.pdf

[9] We have combined modem sync speeds of ADSL connections with the headline speeds of cable broadband connections. See Annex 2 for details.

correspond exactly to the speeds experienced by consumers. The actual average speeds experienced by consumers when using the internet will typically be slightly lower due to factors such as traffic congestion; data overheads associated with sending data across the internet and the performance of the servers to which the consumers is connecting. For these reasons the average modem sync speeds presented in this report are not directly comparable with the average speeds reported in Ofcom's previous research into broadband speeds.[10] However, this metric does provide a reliable indicator of the capability of the broadband infrastructure, it can easily be tracked over time and data is available to undertake analysis on a detailed geographic basis.

- The **superfast availability** metric includes all of the areas where Virgin Media is able to provide broadband services via its cable network and those areas outside Virgin's network where the Digital Region[11] and Openreach have deployed Fibre to the Cabinet (FTTC) technology at a telephone exchange.

  For the Openreach FTTC deployments, the metric reflects the percentage of premises that are within the catchment area of a FTTC enabled telephone exchange. However, in practice some premises may not be able to receive superfast services. This is because some street cabinets within the exchange area may not be upgraded at the same time as the exchange. Even where a cabinet has been upgraded, some lines may be too far from the fibre enabled cabinet to achieve high speeds.

  Typically, 80% to 90% of premises within an exchange area will be enabled in the initial deployment phase; hence the metric we have used may over estimate superfast broadband availability in non cabled areas. However, further coverage may be achieved in these areas at a later date as new technologies are developed and the commercial case for investment improves.

- The percentage of homes **receiving less than 2Mbit/s** download speeds is calculated from a large sample of existing customers using broadband delivered over telephone lines. The number of connections with modem sync speeds of 2.2 Mbit/s[12] or less is divided by the total number of non superfast broadband connections. It is important to note that many customers achieving speeds of less than 2Mbit/s could take action to achieve higher speeds (see below).

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[10] See http://stakeholders.ofcom.org.uk/market-data-research/telecoms-research/broadband-speeds/speeds-nov-dec-2010/
[11] See http://www.digitalregion.co.uk/dr-project for details
[12] See Annex 2 for details of why 2.2Mbit/s has been used rather than 2.0Mbit/s

Section 3

Fixed broadband in the UK

2.1   The results of our analysis are shown in Annex 1.

2.2   To help simplify the comparison between authorities each of the metrics has been converted to a simple five point scale in which 1 represents the best performance. An overall measure is derived for each area by adding the individual 'scores' for each metric. These total scores are then also converted to a five point scale to provide an overall view of broadband in each area. The thresholds used to convert each metric to the five point scale are detailed in Annex 2.

2.3   The results in Annex 1 are listed in alphabetical order.

2.4   The results are also available on an interactive map on the Ofcom website:

http://maps.ofcom.org.uk/broadband/index.html

2.5   The data can also be sorted by each metric using a table provided on the website:

http://maps.ofcom.org.uk/broadband/table.html

2.6   Figure 2.1 summarises the metrics for each country within the UK.

Figure 2.1: National broadband measures

	Average modem sync speed (Mbit/s)	Receiving less than 2Mbit/s	Superfast availability	Take-up
England	7.6	14%	61%	69%
Scotland	7.6	13%	41%	65%
Northern Ireland	6.3	23%	97%	60%
Wales	6.5	19%	31%	63%
Total UK	7.5	14%	58%	68%

Observations on the data

2.7   The results provide a useful insight into the state of UK broadband.

2.8   As might be expected, the results highlight that overall broadband performance is lower in areas of low population density, such as rural Scotland and Wales. This is reflected in lower average modem sync speeds, higher percentages of homes unable to achieve 2 Mbit/s and lower availability of superfast broadband. There are a number of factors that contribute to this:

   i)   There is limited availability of cable networks in rural areas due to the high cost of building new networks in areas where there is a large distance between premises. The higher modem sync speeds available via cable networks tends to boost average modem sync speeds and all homes using cable are able to achieve speeds in excess of 2 Mbit/s and have the option of subscribing to superfast services.

   ii)   In many rural areas BT Wholesale (part of the BT Group) is the only operator that has chosen to install broadband equipment in the local telephone exchange and in many exchanges this is ADSL technology which supports a maximum speed of 8Mbit/s. In more urban areas multiple operators have deployed ADSL2+ equipment which is capable of delivering modem sync speeds of up to 24 Mbit/s.

   iii) For broadband services delivered over telephone lines, achievable modem sync speeds are dependent on the length and quality of the line. In rural areas average line lengths tend to be longer and hence lower speeds are achieved.

2.9   There is high availability of superfast broadband across Northern Ireland. This is a result of private investment by BT, Virgin Media and other communication providers and a public procurement project lead by the Department of Enterprise, Trade and Investment (DETI) which aimed to bring superfast broadband to 85% of businesses and was completed in April of this year. BT has subsequently announced that it will continue to invest in Northern Ireland as part of its ongoing superfast broadband deployment. It has announced that 88% of lines will be served from a FTTC enabled street cabinet by March 2012.[13]

2.10   For the reasons set out in paragraph 1.17, whilst some areas of Northern Ireland are listed as being 100% covered by superfast enabled telephone exchanges, this does not necessarily mean that superfast services are currently available on every line. Consumers should check ISP websites to determine whether they are able to upgrade to superfast at their specific address.

2.11   Whilst superfast availability is high, Northern Ireland currently has some of the lowest average sync speeds and highest percentages of households achieving speeds of less than 2Mbit/s. We would expect that this situation will change over the coming months as more consumers choose to upgrade to the newly available superfast services. The relatively low take-up numbers for non superfast services in some parts of Northern Ireland may indicate that customers are already migrating to superfast services. DETI also continues to run a programme to provide broadband to the most

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[13] See http://www.nibroadband.com/news_fibreannounce.html for details

rural areas and has a contract with Avanti communications to offer satellite broadband to those customers unable to receive fixed line services.[14]

2.12   The broadband picture in the Western Isles (Na h-Eileanan an Iar) is complicated by the fact that not all telephone exchanges are broadband enabled. This is reflected in the low take up of fixed line broadband (although wireless broadband services are available to some consumers through the "Connected Communities" project[15]). The lack of fixed broadband in some areas will mean that the percentage of households unable to achieve 2Mbit/s we have quoted for the Western Isles will understate the scale of the problem. However, the Highlands and Islands Enterprise, the economic and development agency for the region, are currently working with Broadband Delivery UK[16] (BDUK) to develop plans to improve broadband across the region, which includes the Western Isles.

2.13   Broadband take-up in the City of Hull is relatively low (50%) compared to similar sized cities in the UK. Broadband in this area is provided by KCom whose network serves the addresses within the boundaries of the City of Hull as well as the surrounding areas which are within the East Riding of Yorkshire. Additional analysis of KCom's services in the East Riding indicates that take-up levels are significantly higher (approximately 64%) suggesting that there are localised circumstances within the City which have resulted in low take-up.

2.14   At a UK level, our analysis indicates that 14% of non-superfast broadband connections are currently not achieving speeds of 2Mbit/s or more. However, in practice, many consumers can take action to receive higher speeds. Consumers wanting to improve their speed can try the following:

- Check with their ISP to see whether they are on a package which limits their speed to below 2Mbit/s and whether their line could reliably support higher speeds.

- For broadband delivered over the telephone line, make sure they have installed the correct filters on each telephone socket and consider installing a special 'iPlate' filter on the front of their telephone master socket to reduce the level of interference from electrical appliances in the home. We have produced a guide to explain this in more detail.[17]

- Check whether other ISPs can offer improved speeds. For example, by switching to cable or FTTC broadband services if these are available at their address. Consumers could also consider whether wireless solutions, such as satellite broadband and mobile broadband delivered via mobile 'dongles' would provide a better service at their address.

By taking these actions, the percentage of broadband connections receiving less than 2Mbit/s could be reduced significantly. We estimate that by switching to cable or FTTC, the percentage of connections receiving less than 2Mbit/s could be reduced

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[14] See http://www.detini.gov.uk/deti-telecoms-index/deti-telecoms-remote-broadband-services.htm for details
[15] See http://www.connectedcommunities.co.uk/
[16] The body tasked by government to work with local authorities to deliver improved broadband. See http://discuss.bis.gov.uk/bduk/
[17]See http://stakeholders.ofcom.org.uk/market-data-research/telecoms-research/broadband-speeds/speeds/ for details

from 14% to below 8%. Addressing in-home installation issues would also have a significant impact.

We plan to undertake further analysis to establish the extent to which these actions can reduce the number of connections that are operating at less than 2Mbit/s in each local authority area.

Section 4

Next steps

3.1   The data presented in this report is a sub-set of the data that we intend to include in the main Infrastructure Report which we are due to present to the Secretary of State later in the year. We expect to make a public version of the report available soon afterwards.

3.2   We are only required to produce the infrastructure report every 3 years, but we think there is value in updating the information on broadband more often so that progress against the government's objectives can be tracked. We therefore plan to work with operators to refine the methodology we have used in this report and produce the data on an annual basis.

Annex 1

UK fixed broadband data

Figure A1.1 UK fixed broadband data

Local Authority	Average sync speed (Mbit/s) (excluding superfast)	score	Percentage receiving less than 2Mbit/s	score	Superfast broadband availability	score	Take-up (excluding superfast)	score	Overall
Aberdeen City	7.4	4	12.2%	3	0%	5	74%	2	3
Aberdeenshire	6.1	4	15.2%	4	0%	5	72%	2	4
Abertawe - Swansea	8.2	3	12.6%	3	68%	3	63%	3	2
Angus	7.1	4	12.6%	3	14%	5	65%	3	4
Antrim	5.8	5	24.4%	5	98%	1	64%	3	3
Ards	6.4	4	17.2%	4	97%	1	64%	3	2
Argyll and Bute	6.0	4	13.7%	3	0%	5	63%	3	4
Armagh	5.3	5	30.2%	5	94%	1	58%	4	4
Ballymena	5.2	5	26.8%	5	97%	1	60%	3	3
Ballymoney	5.8	5	26.9%	5	88%	2	59%	4	4
Banbridge	6.1	4	24.7%	5	90%	1	61%	3	3
Barnsley District	6.9	4	18.7%	4	72%	2	59%	4	3
Bath and North East Somerset	7.2	4	15.2%	4	77%	2	76%	2	2
Bedford	7.1	4	18.5%	4	80%	2	73%	2	2
Belfast	8.9	3	8.4%	2	97%	1	60%	3	1
Birmingham District	8.9	3	8.3%	2	86%	2	64%	3	2
Blackburn with Darwen	7.3	4	13.2%	3	62%	3	63%	3	3
Blackpool	9.5	3	7.1%	2	63%	3	61%	3	2
Blaenau Gwent - Blaenau Gwent	7.5	4	13.7%	3	0%	5	54%	4	4
Bolton District	8.2	3	11.9%	3	83%	2	64%	3	2
Bournemouth	9.0	3	8.0%	2	79%	2	68%	3	2
Bracknell Forest	6.1	4	24.9%	5	84%	2	77%	2	3
Bradford District	8.3	3	10.8%	3	81%	2	62%	3	2
Bro Morgannwg - the Vale of Glamorgan	7.5	4	14.6%	3	63%	3	70%	2	2
Buckinghamshire County	6.4	4	16.9%	4	67%	3	78%	2	3
Bury District	7.1	4	13.4%	3	90%	1	64%	3	2
Caerdydd - Cardiff	7.8	4	16.0%	4	89%	2	68%	3	3
Caerffili - Caerphilly	6.0	4	25.0%	5	33%	4	61%	3	4
Calderdale District	6.8	4	16.6%	4	56%	3	61%	3	3
Cambridgeshire County	7.2	4	15.8%	4	53%	3	74%	2	3
Carrickfergus	5.4	5	28.2%	5	99%	1	60%	3	3
Casnewydd - Newport	7.5	4	15.3%	4	65%	3	64%	3	3

Local Authority	Average sync speed (Mbit/s) (excluding superfast)	score	Percentage receiving less than 2Mbit/s	score	Superfast broadband availability	score	Take-up (excluding superfast)	score	Overall
Castell-nedd Port Talbot - Neath Port Talbot	7.6	4	15.9%	4	58%	3	60%	3	3
Castlereagh	7.1	4	18.0%	4	97%	1	63%	3	2
Central Bedfordshire	7.5	4	13.8%	3	67%	3	73%	2	2
Cheshire East	6.7	4	16.9%	4	67%	3	71%	2	3
Cheshire West and Chester	6.7	4	17.0%	4	43%	4	70%	2	3
City of Bristol	9.9	3	4.5%	1	90%	1	71%	2	1
City of Derby	8.4	3	11.1%	3	89%	2	65%	3	2
City of Edinburgh	10.1	2	4.5%	1	82%	2	69%	3	1
City of Kingston upon Hull	7.3	4	7.2%	2	0%	5	50%	4	4
City of Leicester	8.8	3	8.3%	2	89%	2	65%	3	2
City of Nottingham	9.1	3	8.2%	2	88%	2	62%	3	2
City of Peterborough	7.2	4	18.2%	4	76%	2	68%	3	3
City of Plymouth	8.7	3	10.3%	3	88%	2	69%	3	2
City of Portsmouth	8.9	3	10.2%	3	95%	1	67%	3	2
City of Southampton	8.0	3	10.3%	3	46%	4	67%	3	3
City of Stoke-on-Trent	7.6	4	13.5%	3	78%	2	58%	4	3
City of Wolverhampton District	9.1	3	6.9%	2	93%	1	60%	3	1
Clackmannanshire	5.6	5	27.8%	5	0%	5	65%	3	5
Coleraine	5.7	5	18.8%	4	98%	1	51%	4	3
Conwy - Conwy	5.7	5	18.6%	4	0%	5	60%	3	5
Cookstown	4.4	5	35.9%	5	98%	1	57%	4	4
Cornwall	6.5	4	18.1%	4	10%	5	67%	3	4
County Durham	6.3	4	20.2%	5	22%	5	60%	3	5
County of Herefordshire	5.0	5	23.8%	5	0%	5	67%	3	5
Coventry District	8.3	3	9.7%	2	66%	3	65%	3	2
Craigavon	5.6	5	26.5%	5	98%	1	61%	3	3
Cumbria County	6.1	4	21.1%	5	0%	5	63%	3	5
Darlington	7.8	4	14.5%	3	83%	2	62%	3	2
Derbyshire County	6.2	4	19.5%	4	38%	4	63%	3	4
Derry	6.5	4	20.5%	5	97%	1	56%	4	3
Devon County	6.4	4	17.2%	4	17%	5	69%	3	4
Doncaster District	7.2	4	16.0%	4	55%	3	61%	3	3
Dorset County	6.2	4	17.9%	4	9%	5	69%	3	4
Down	5.4	5	23.8%	5	93%	1	58%	4	4
Dudley District	8.5	3	8.8%	2	92%	1	62%	3	1
Dumfries and Galloway	6.1	4	15.0%	4	0%	5	59%	4	5
Dundee City	9.3	3	7.8%	2	88%	2	61%	3	2
Dungannon	4.7	5	33.2%	5	97%	1	57%	4	4

Local Authority	Average sync speed (Mbit/s) (excluding superfast)	score	Percentage receiving less than 2Mbit/s	score	Superfast broadband availability	score	Take-up (excluding superfast)	score	Overall
East Ayrshire	5.8	5	21.9%	5	0%	5	60%	3	5
East Dunbartonshire	9.0	3	7.7%	2	77%	2	73%	2	1
East Lothian	7.1	4	11.4%	3	0%	5	68%	3	4
East Renfrewshire	8.6	3	7.8%	2	86%	2	78%	2	1
East Riding of Yorkshire	6.9	4	13.6%	3	0%	5	61%	3	4
East Sussex County	6.7	4	15.6%	4	3%	5	71%	2	4
Essex County	6.8	4	16.9%	4	50%	3	72%	2	3
Falkirk	8.4	3	9.2%	2	81%	2	69%	3	2
Fermanagh	4.3	5	32.9%	5	96%	1	60%	3	3
Fife	7.0	4	14.0%	3	48%	4	65%	3	3
Gateshead District	8.8	3	8.9%	2	68%	3	61%	3	2
Glasgow City	8.9	3	10.0%	3	59%	3	58%	4	3
Gloucestershire County	6.6	4	17.6%	4	35%	4	70%	2	3
Gwynedd - Gwynedd	5.4	5	20.3%	5	0%	5	57%	4	5
Halton	7.4	4	19.1%	4	66%	3	65%	3	3
Hampshire County	7.2	4	15.3%	4	68%	3	75%	2	3
Hartlepool	7.9	4	18.3%	4	88%	2	57%	4	3
Hertfordshire County	7.7	4	14.1%	3	85%	2	76%	2	2
Highland	5.7	5	17.2%	4	0%	5	66%	3	5
Inverclyde	8.6	3	7.0%	2	69%	3	58%	4	2
Isle of Wight	7.3	4	12.4%	3	0%	5	64%	3	4
Isles of Scilly	4.5	5	24.8%	5	0%	5	66%	3	5
Kent County	6.8	4	17.3%	4	41%	4	70%	2	3
Kirklees District	7.0	4	17.0%	4	57%	3	63%	3	3
Knowsley District	7.8	4	17.1%	4	76%	2	62%	3	3
Lancashire County	7.4	4	14.8%	3	39%	4	66%	3	3
Larne	5.6	5	27.8%	5	90%	1	58%	4	4
Leeds District	7.9	4	14.1%	3	82%	2	64%	3	2
Leicestershire County	7.4	4	14.3%	3	64%	3	70%	2	2
Limavady	6.2	4	29.5%	5	98%	1	55%	4	3
Lincolnshire County	6.5	4	17.2%	4	23%	5	66%	3	4
Lisburn	5.4	5	28.8%	5	97%	1	64%	3	3
Liverpool District	9.5	3	6.6%	2	77%	2	59%	4	2
London	8.8	3	7.9%	2	85%	2	78%	2	1
Luton	8.1	3	16.3%	4	100%	1	68%	3	2
Magherafelt	5.0	5	26.6%	5	93%	1	59%	4	4
Manchester District	8.2	3	10.7%	3	78%	2	63%	3	2
Medway	8.2	3	13.8%	3	77%	2	70%	2	2
Merthyr Tudful - Merthyr Tydfil	6.0	4	21.9%	5	0%	5	55%	4	5
Middlesbrough	9.0	3	9.6%	2	91%	1	58%	4	2

Local Authority	Average sync speed (Mbit/s) (excluding superfast)	score	Percentage receiving less than 2Mbit/s	score	Superfast broadband availability	score	Take-up (excluding superfast)	score	Overall
Midlothian	6.0	4	21.0%	5	20%	5	67%	3	5
Milton Keynes	5.5	5	29.7%	5	90%	1	78%	2	3
Moray	5.7	5	16.2%	4	0%	5	67%	3	5
Moyle	5.2	5	24.3%	5	93%	1	47%	5	4
Na H-Eileanan an Iar	5.1	5	23.0%	5	0%	5	46%	5	5
Newcastle upon Tyne District	8.8	3	8.6%	2	63%	3	64%	3	2
Newry and Mourne	5.3	5	29.7%	5	94%	1	56%	4	4
Newtownabbey	7.2	4	19.8%	4	100%	1	68%	3	2
Norfolk County	6.4	4	17.6%	4	28%	5	66%	3	4
North Ayrshire	7.3	4	12.9%	3	0%	5	58%	4	4
North Down	5.4	5	26.1%	5	98%	1	64%	3	3
North East Lincolnshire	9.1	3	6.7%	2	90%	1	60%	3	1
North Lanarkshire	7.9	4	16.8%	4	68%	3	63%	3	3
North Lincolnshire	6.6	4	21.8%	5	41%	4	63%	3	4
North Somerset	7.0	4	13.4%	3	48%	4	72%	2	3
North Tyneside District	8.1	3	12.5%	3	59%	3	65%	3	2
North Yorkshire County	6.6	4	17.1%	4	15%	5	68%	3	4
Northamptonshire County	7.2	4	14.9%	3	59%	3	71%	2	2
Northumberland	6.3	4	18.9%	4	9%	5	66%	3	4
Nottinghamshire County	7.7	4	14.8%	3	65%	3	67%	3	3
Oldham District	7.0	4	18.5%	4	88%	2	59%	4	3
Omagh	5.5	5	31.9%	5	99%	1	56%	4	4
Orkney Islands	5.4	5	21.6%	5	0%	5	65%	3	5
Oxfordshire County	7.0	4	14.5%	3	62%	3	75%	2	2
Pen-y-bont ar Ogwr - Bridgend	6.3	4	21.6%	5	33%	4	65%	3	4
Perth and Kinross	6.9	4	13.4%	3	33%	4	67%	3	3
Poole	8.0	3	12.3%	3	78%	2	71%	2	2
Powys - Powys	5.3	5	21.2%	5	0%	5	62%	3	5
Reading	8.9	3	8.3%	2	98%	1	77%	2	1
Redcar and Cleveland	8.6	3	10.1%	3	87%	2	62%	3	2
Renfrewshire	8.4	3	10.7%	3	68%	3	64%	3	2
Rhondda Cynon Taf - Rhondda Cynon Taff	6.4	4	22.7%	5	27%	5	60%	3	5
Rochdale District	6.9	4	18.4%	4	58%	3	62%	3	3
Rotherham District	7.2	4	15.6%	4	55%	3	61%	3	3
Rutland	5.8	5	22.1%	5	0%	5	74%	2	5
Salford District	9.1	3	8.2%	2	75%	2	59%	4	2
Sandwell District	8.7	3	9.2%	2	78%	2	55%	4	2
Scottish Borders	5.9	5	14.7%	3	0%	5	63%	3	4

Local Authority	Average sync speed (Mbit/s) (excluding superfast)	score	Percentage receiving less than 2Mbit/s	score	Superfast broadband availability	score	Take-up (excluding superfast)	score	Overall
Sefton District	8.8	3	8.3%	2	68%	3	65%	3	2
Sheffield District	7.2	4	16.4%	4	70%	2	61%	3	3
Shetland Islands	5.5	5	19.9%	4	0%	5	71%	2	4
Shropshire	5.8	5	18.9%	4	3%	5	67%	3	5
Sir Benfro - Pembrokeshire	4.8	5	25.5%	5	0%	5	60%	3	5
Sir Ceredigion - Ceredigion	4.8	5	25.3%	5	0%	5	61%	3	5
Sir Ddinbych - Denbighshire	6.7	4	14.9%	3	0%	5	67%	3	4
Sir Fynwy - Monmouthshire	6.1	4	16.8%	4	16%	5	69%	3	4
Sir Gaerfyrddin - Carmarthenshire	5.3	5	25.6%	5	0%	5	60%	3	5
Sir y Fflint - Flintshire	5.7	5	21.5%	5	22%	5	68%	3	5
Sir Ynys Mon - Isle of Anglesey	5.4	5	21.9%	5	0%	5	60%	3	5
Slough	6.4	4	22.7%	5	98%	1	68%	3	3
Solihull District	8.3	3	10.0%	3	89%	2	68%	3	2
Somerset County	6.0	4	17.7%	4	4%	5	70%	2	4
South Ayrshire	6.4	4	14.8%	3	0%	5	62%	3	4
South Gloucestershire	8.0	3	13.4%	3	75%	2	72%	2	2
South Lanarkshire	7.7	4	15.2%	4	59%	3	65%	3	3
South Tyneside District	8.2	3	14.2%	3	77%	2	57%	4	2
Southend-on-Sea	9.3	3	5.8%	2	77%	2	68%	3	2
St. Helens District	8.0	3	14.7%	3	83%	2	63%	3	2
Staffordshire County	6.7	4	18.2%	4	47%	4	66%	3	4
Stirling	6.4	4	16.3%	4	0%	5	69%	3	4
Stockport District	8.8	3	8.3%	2	94%	1	67%	3	1
Stockton-on-Tees	8.3	3	14.2%	3	84%	2	64%	3	2
Strabane	5.8	5	26.1%	5	99%	1	52%	4	4
Suffolk County	6.3	4	19.8%	4	29%	5	69%	3	4
Sunderland District	6.9	4	18.0%	4	55%	3	60%	3	3
Surrey County	7.4	4	13.7%	3	77%	2	78%	2	2
Swindon	7.6	4	13.1%	3	87%	2	71%	2	2
Tameside District	7.7	4	10.5%	3	86%	2	61%	3	2
Telford and Wrekin	8.3	3	10.1%	3	75%	2	67%	3	2
The City of Brighton and Hove	9.3	3	8.0%	2	92%	1	80%	1	1
Thurrock	8.0	3	14.3%	3	75%	2	71%	2	2
Torbay	8.6	3	7.0%	2	42%	4	65%	3	2
Tor-faen - Torfaen	5.8	5	21.7%	5	27%	5	63%	3	5
Trafford District	8.5	3	9.4%	2	87%	2	72%	2	1

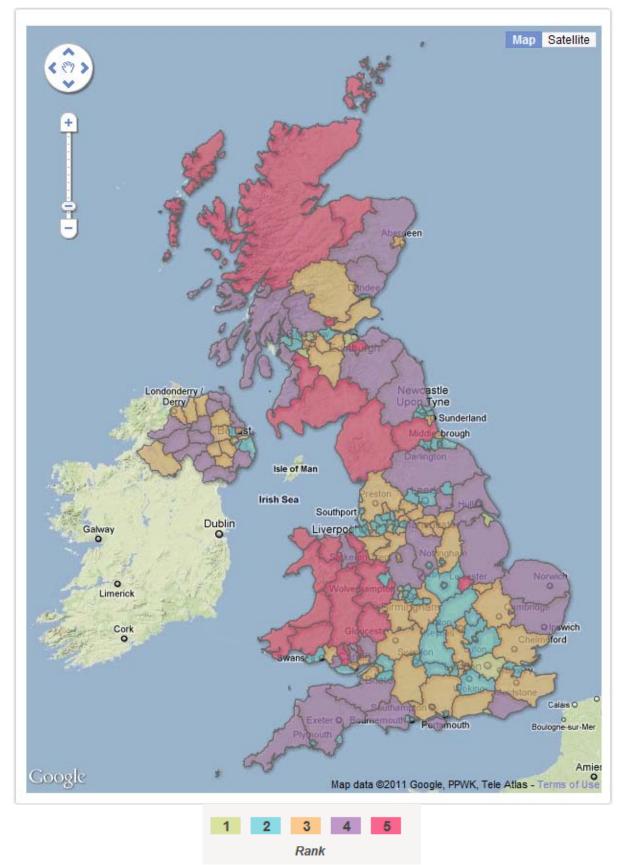| Local Authority	Average sync speed (Mbit/s) (excluding superfast)	score	Percentage receiving less than 2Mbit/s	score	Superfast broadband availability	score	Take-up (excluding superfast)	score	Overall
Wakefield District	6.8	4	20.0%	5	54%	3	62%	3	4
Walsall District	8.2	3	10.6%	3	87%	2	58%	4	2
Warrington	7.5	4	16.7%	4	76%	2	70%	2	2
Warwickshire County	6.8	4	18.1%	4	66%	3	70%	2	3
West Berkshire	6.9	4	14.2%	3	63%	3	77%	2	2
West Dunbartonshire	9.5	3	6.5%	2	89%	2	61%	3	2
West Lothian	7.5	4	13.7%	3	45%	4	70%	2	3
West Sussex County	7.3	4	13.3%	3	42%	4	73%	2	3
Wigan District	8.6	3	11.1%	3	87%	2	63%	3	2
Wiltshire	6.8	4	14.4%	3	43%	4	74%	2	3
Windsor and Maidenhead	5.6	5	24.4%	5	94%	1	78%	2	3
Wirral District	8.3	3	9.9%	2	60%	3	65%	3	2
Wokingham	7.0	4	18.9%	4	82%	2	78%	2	2
Worcestershire County	6.1	4	19.0%	4	59%	3	70%	2	3
Wrecsam - Wrexham	5.9	5	19.1%	4	0%	5	64%	3	5
York	7.1	4	13.5%	3	59%	3	70%	2	2

Figure A1.2 UK fixed broadband map: overall view

Map data copyright of Google 2011, PPWK and TeleAtlas 2011

Annex 2

Detailed methodology

Detailed methodology

A2.1   This annex provides details of the methodology used to derive the figures presented in the Annex 1.

A2.2   Data from a number of sources have been used, including Openreach, Virgin Media and the larger Internet Service Providers (ISPs). Geographic information has been used from Ordnance Survey.

Market size

A2.3   To derive take-up and availability figures it has been necessary to define a potential market size i.e. the number broadband connections that would be required to achieve 100% take-up in an area.

A2.4   We have used data from Ordnance Survey & the Post Office relating to the number of residential and non-residential postal delivery points per post code (this excludes PO Boxes) to define the market size.

Broadband take-up

A2.5   The number of active broadband connections has been derived by adding the total number of Virgin Media and Wight Cable cable broadband connections with the number of telephone lines operated by Kingston Communications and those Openreach leases to ISPs.

A2.6   The figures do not include superfast broadband connections. The latest publically available figures from BT an Virgin Media suggest that there are currently less than 500k superfast broadband connection in the UK, fewer than 3% of total broadband connections. Due to this relatively low level of take-up, and the commercial sensitivity regarding the regional variations in take-up, we have decided not to include superfast take-up in this report. However, we will consider including these statistics in future reports as the market matures.

Superfast broadband availability

A2.7   We have reported on the proportion of residential and non-residential addresses that are within postcodes served by Virgin Media's cable network or the Digital Region FTTC cabinets and/or the BT exchanges which Openreach has enabled for one or more FTTC cabinets.

A2.8   However, it should be noted that not all cabinets attached to a FTTC exchange will necessarily have been upgraded to fibre. This may be because the cabinet serves too few lines to be economically viable at today's cost of deployment, or it may be that Fibre to the Premises (FTTP) will be deployed at a later date. In addition, some lines served from a FTTC cabinet may not support speeds in excess of 24Mbit/s due to the length of the line from the cabinet to the customer premises. Typically, 80% to 90% of premises within an exchange area will be enabled for superfast broadband when an exchange is enabled.

A2.9   Given these limitations, our methodology will tend to overestimate the availability of superfast broadband delivered using FTTC. However, a significant proportion of FTTC deployment is currently within the footprint of Virgin Media's cable network and so superfast availability will be virtually 100% in these areas. Whilst there will be a margin of error in the absolute level of availability outside of the cable networks, the metric does allow relative availability in different areas to be compared.

A2.10   As FTTC coverage extends significantly beyond the cable footprint we will look to refine the methodology to ensure any gaps in superfast coverage are identified.

Average modem sync speeds

A2.11   For broadband delivered over telephone lines using the family of "Digital Subscriber Line" (DSL) technologies, the modem sync speed is the downstream data rate at which the ISPs equipment in the local exchange sends data to the customer's broadband modem. Speeds will vary depending on what technology is deployed (e.g. ADSL support a maximum of 8 Mbit/s, ADSL2+ support up to 24Mbit/s) and the quality of the telephone line (which is primarily driven by its length).

A2.12   The modem sync speed represents the highest possible speed that data can be transferred across the line (when using the particular DSL technology variant). In practice, the speeds achieved by the end user will always be lower because some of the capacity of the connection is required for information to help send the users data across the internet. Speeds may also reduce further when there is network congestion or web servers are heavily loaded.

A2.13   Whilst modem sync speeds do not therefore directly reflect end user experience, they are a very useful proxy of the state of the UK broadband over telephone line infrastructure.

A2.14   Our calculations of average modem sync speeds also include existing cable broadband connections. For these connections we have used the headline speed of the broadband package of each existing consumer to calculate the average (e.g. 10Mbit/s, 20Mbit/s etc.). In practice, the modem sync speeds set by the cable operator are usually higher than the headline package speed to ensure that end users can experience the advertised speed.

A2.15   The average modem sync speeds presented in the report are based on our analysis of over 13m broadband connections. The composition of the sample reflects the mix of technologies (ADSL, ADSL2+, Cable) and telephone line lengths in use across the UK. Due to the reasons explained above, the sample does not include data from the relatively small percentage of superfast broadband connections in the UK.

Receiving less than 2Mbit/s broadband

A2.16   Using the same sample of DSL connections used to derive the average modem sync speeds, we have identified the percentage of customers receiving broadband over their telephone line at speeds of less than 2 Mbit/s.

A2.17   As outlined above, speeds experienced by end users will always be less than their modem sync speed. To account for this, we have identified those connections that have modem sync speeds of less than 2.2Mbit/s, thereby allowing for a 10% overhead on the connection.

A2.18   Some customers may be on low speed legacy broadband packages e.g.1 Mbit/s and hence are included in the metric. Whilst these customer may simply need to switch to a different package (e.g. up to 8Mit/s) to achieve higher speeds, some customers will have been placed on these slower speed packages because it has already been established that their line cannot support higher speeds and restricting the speed can improve the stability of the connection. We have therefore chosen not to exclude these customers from our calculations.

A2.19   Our analysis does not include a measure of the percentage of premises that are unable to receive broadband even at very low speeds (for example, because they are too far from the telephone exchange). This is because we only have data on active broadband connections. We estimate that less than 1% of premises nationally are unable to get a broadband connection at all. In practice, the percentage of customers unable to achieve 2Mbit/s is likely to be an accurate barometer of those that cannot get a service at all as the primary factor driving both metrics is the average line length.

A2.20   We have not adjusted the measure to reflect the percentage of consumers receiving less than 2Mbit/s who could improve their speeds by switching to cable or FTTC networks (where these are available at their address) or addressing problems with in home installation that are effecting their speed. We expect that these actions could significantly reduce the number of consumers receiving less than 2Mbit/s and we intend to do further analysis to understand the impact of such actions in each local authority area.

Five point scale

A2.21   To allow easier comparison of the results across the 200 administrative authorities we have mapped each metric onto a 5 point scale. The mappings have been primarily chosen to provide an even distribution across the scale, although Government objectives have also been considered. For example, a score of 1 for superfast broadband availability requires over 90% availability to reflect the Government's goals.

A2.22   Having derived a 1-5 score of each metric, these have been added to produce an overall score for each authority (minimum possible score is 4, maximum is 20). These total scores have also been converted to a 5 point scale.

A2.23   The thresholds used to convert each metric and the overall score to its corresponding 5 point scale are shown in figure A2.1

Figure A2.1 Thresholds to derive 5 point scales

Score	Take-up	Superfast availability	Average modem sync speed (Mbit/s)	Receiving less than 2Mbit/s	Overall
1	>= 80%	>= 90%	>=16%	<5%	<10
2	70% to <80%	70% to < 90%	10% to <16%	5% to <10%	10 to <12
3	60% to < 70%	50% to <70%	8% to <10%	10% to <15%	12 to <14
4	50% to <60%	30% to < 50%	6% to <8%	15% to <20%	14 to <16
5	< 50%	<30%	<6%	>= 20%	>=16

A2.24   The 5 point scales are represented by different colours on the UK maps.