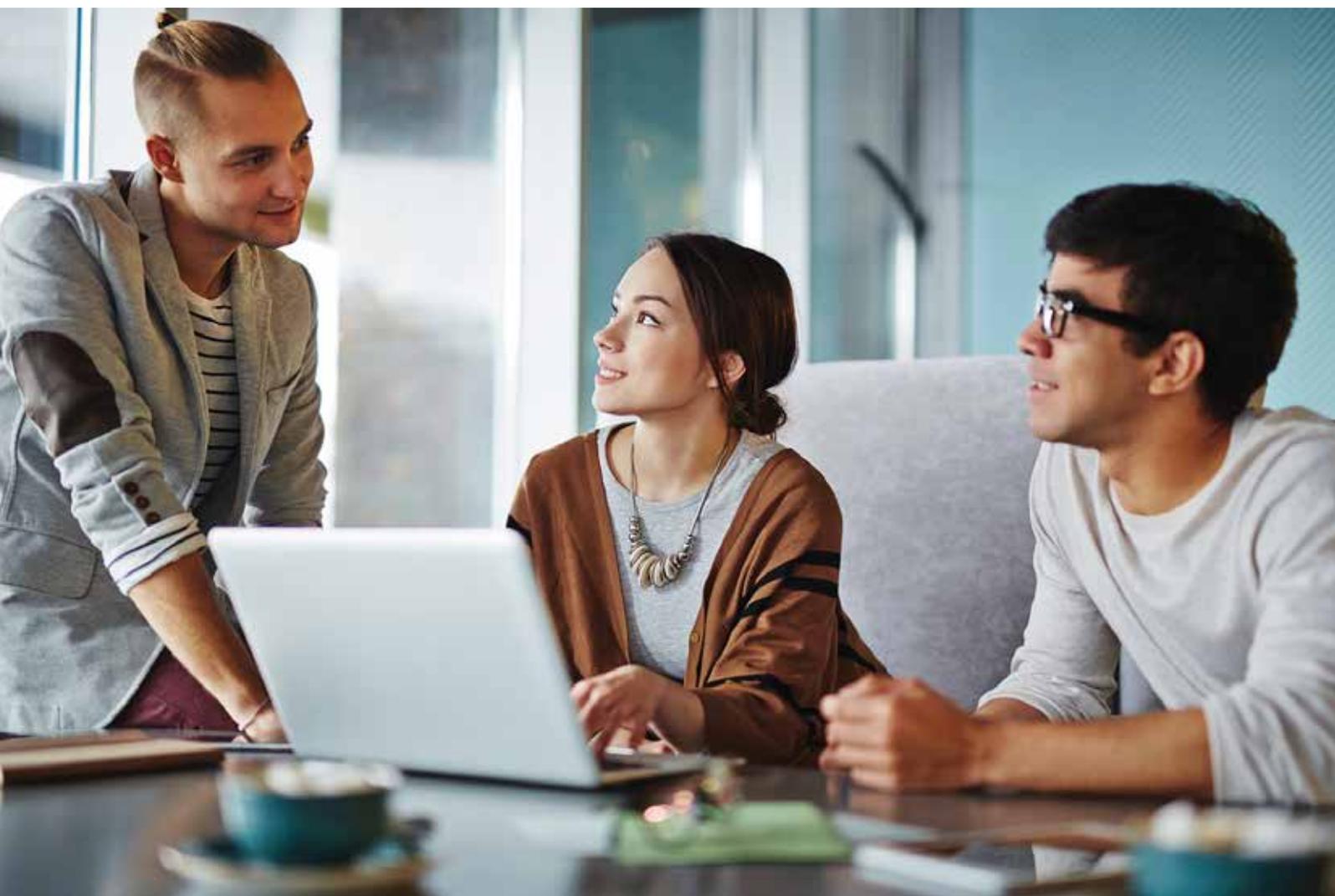# Connected Nations 2015

Northern Ireland

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Ofcom

Contents

Section 1

Connected Nations – Across the UK

Introduction

1.1   Under section 134A of the Communications Act 2003 ('the Act') Ofcom is required to submit a report to the Secretary of State every three years, describing the state of the electronic communications networks and services in the UK.

1.2   Full reports were published in 2011 and 2014 and this year we are publishing an update – The Connected Nations Report – focussing on those areas seeing the most rapid change, including the coverage of fixed, mobile and broadcast networks and the capacity of fixed and mobile broadband networks.

1.3   For the first time, we are also publishing individual reports for each of the constituent nations of the UK where availability of communications services varies and where devolved administrations play a leading role in public interventions.

1.4   The key developments across the nations are:

   1.4.1   Wales and Scotland have seen significant increases in next generation access and superfast broadband coverage. This increase has benefitted rural areas in particular. Northern Ireland has not seen such substantial increases but this reflects the early intervention that took place which realised significant increases in previous years;

   1.4.2   Households in Northern Ireland have taken up superfast packages (where they are available) more readily than the rest of the UK but use less data than the UK average;

   1.4.3   The difference in speeds between urban and rural areas has stayed at a similar margin, largely due to the focus of intervention programmes in rural areas. The gap will ultimately increase as urban areas progress towards ultrafast speeds; and

   1.4.4   While the availability of 2G voice services has remained static, there has been a significant increase in the availability of 3G voice and data, and 4G services have begun to roll out in urban areas.

1.5   Access to high quality fixed and mobile internet services is vital to our increasingly online social and economic lives. In the last year, all nations across the UK have seen some increase in the coverage of these services. However, there are many areas of the UK where fast broadband services remain unavailable and where mobile coverage is poor.

1.6   It remains the case that the individual nations of Scotland, Wales and Northern Ireland as well as rural England see lower availability of communications services than the UK as a whole. The comparative lack of disruptive market forces and competition mean that the usual channels to create increased coverage in many of the more remote areas of the UK are absent and partly publicly funded intervention programmes have been used to help reach these areas.

1.7   Fixed broadband and 4G services have seen the largest increases in the number of premises now able to access services. In the case of 4G this has been as a result of commercial rollout. For fixed broadband, this has been a result of a blend of commercial and publicly supported rollout of services under the joint BDUK[1] and devolved government programmes in the nations.

1.8   The remainder of this Northern Ireland report describes in more detail the state of fixed and mobile network coverage.

Summary of fixed and mobile coverage in the UK

1.9   Figure 1 and Figure 2 below offer an 'at a glance' picture of connectivity in the nations of the UK.

Figure 1: Coverage of Next Generation Access (NGA) and Superfast Broadband (SFBB) has increased between 2013 and 2015

	2015 SFBB	2015 NGA	2014 SFBB	2014 NGA	2013 NGA
UK	83%	90%	75%	78%	73%
England	84%	90%	77%	80%	76%
Scotland	73%	85%	61%	63%	52%
Wales	79%	87%	55%	58%	48%
NI	77%	95%	77%	94%	96%

Source: Ofcom analysis of operator data

Figure 2: Coverage of 2G and 3G networks across the UK

	Premises where outdoor 2G (voice) coverage is available from all operators, %		Premises where outdoor 3G (voice and data) coverage is available from all operators, %	
	2015	2014	2015	2014
UK	97%	97%	88%	84%
England	98%	98%	91%	87%
Northern Ireland	92%	91%	73%	63%
Scotland	95%	95%	79%	75%
Wales	90%	90%	67%	65%

Source: Ofcom analysis of operator data

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[1] Broadband Delivery UK administers a number of programmes on behalf of the UK government intended to increase the coverage of fixed and mobile broadband.

1.10   The availability of superfast broadband (greater than 30Mbit/s) has remained steady in Northern Ireland this year, reflecting the early completion of the original widespread public investment in Fibre To The Cabinet (FTTC). Two further public interventions in fibre-based broadband are ongoing so their full impact is not reflected in the figures being reported for 2015.

1.11   The percentage of premises in Northern Ireland covered by all four 3G operators has increased by 10% this year.

1.12   A new, innovative measurement approach[2] commissioned by Ofcom has found that Wi-Fi performance and congestion, occurring outside the ISP network in the wider internet, can combine to affect the broadband experience of consumers with both low speed and superfast connections. In particular, we have found that the performance of in-home Wi-Fi networks plays a significant role in approximately 25% of households that experience problems with their broadband. We have launched an app for smartphones and tablets that tests Wi-Fi networks for performance issues. It will help consumers identify if their broadband is not performing as it should, and suggest simple troubleshooting steps to improve performance.

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[2] http://stakeholders.ofcom.org.uk/binaries/research/infrastructure/2015/downloads/qoe-analysis.pdf
http://stakeholders.ofcom.org.uk/binaries/research/infrastructure/2015/downloads/qoe_uk-analysis.pdf

Fixed broadband in Northern Ireland

Scorecard for 2015

Fixed broadband networks	Northern Ireland	UK
Coverage of broadband faster than • **2 Mbit/s (% of premises)** • **5 Mbit/s (% of premises)** • **10 Mbit/s (% of premises)**	94% 91% 86%	98% 96% 91%
Coverage of NGA (Next Generation Access) (% of premises)	95%	90%
Superfast broadband coverage (% of premises)	77%	83%
Superfast broadband coverage in rural areas (% of premises)	40%	37%
Fixed broadband take-up (% of residential premises)	69%	78%
Broadband take-up (fixed and mobile)	72%	80%
Superfast broadband take-up (% of premises)	38%	33%
Average broadband speed (download)	28.3 Mbit/s	29.0 Mbit/s
Average broadband speed (upload)	4.5 Mbit/s	3.5 Mbit/s
Average broadband download speeds by settlement type	**Urban:** 32.5 Mbit/s **Rural:** 18 Mbit/s	**Urban:** 31.3 Mbit/s **Rural:** 11.6Mbit/s
Premises that could receive less than 2Mbit/s	5.7%	1.8%
Data use (Average monthly)	76.8GB	82.3GB

Key points

2.1   The most important points for fixed broadband in Northern Ireland are:

2.1.1   **Average download speeds increased by 3.5 Mbit/s to an average headline speeds of 28.3 Mbit/s.** This represents a 19% increase. Ofcom has also reported on upload speeds this year and in Northern Ireland average upload speeds are 4.5Mbit/s, higher than UK average of 3.5 Mbit/s.

2.1.2   **Take-up of superfast services (speeds that are >30Mbit/s) is nearly half of availability.** 37% of premises in areas where superfast services are available (77%) have taken up the service. Take up of superfast broadband is higher in Northern Ireland than England, Scotland or Wales.

2.1.3   **Two additional public interventions** are ongoing and will further extend the availability of fibre-based broadband across Northern Ireland.

Government targets and intervention

2.2   The intervention programme for Northern Ireland is outlined below:

	Target	Number of premises in intervention	Cost (BT contribution)
Northern Ireland **'Superfast NI'**	Next Generation Broadband Project • Fibre to 1,288 roadside cabinets • Completed in July 2011	30 000 businesses and 250 000 households	£52m (BT £31m)
	NI Broadband Improvement Project • Targeting areas with less than 2Mbit/s via 450 FFTC and 150 FTTP nodes • Due to complete December 2015	45 000	£23.7m (BT £4.4m)
	Superfast Extension Programme • Targeting areas with less than 24Mbit/s via 300 FTTC and 300 FTTP nodes • Due to complete December 2017	39 000	£17m (BT £2.4m)

2.3   Northern Ireland has benefitted from early intervention in Next Generation Access led by the Department of Enterprise, Trade and Investment (DETI).

2.4   DETI's Next Generation Broadband Project built on BT's commercial Fibre To The Cabinet rollout to make fibre-enabled broadband widely available across Northern Ireland. The project met an objective of the Northern Ireland Executive to deliver higher speed broadband services to at least 85% of businesses.

2.5   Two further DETI-led broadband interventions are in progress and their impact is not therefore reflected in the Northern Ireland figures shown in this report.

2.6   The Northern Ireland Broadband Improvement Project is targeted at premises currently not able to receive speeds above 2Mbit/s. The Superfast Extension Programme aims to lift broadband speeds to the targeted premises above 24Mb/s, in line with DETI's definition of superfast broadband.

2.7   It is expected that both projects will lead to an increase in the overall percentage of premises in Northern Ireland able to receive superfast broadband. It is also expected that when these interventions are complete, the number of rural premises receiving less than 2Mb/s will reduce to approximately 11%[3].

2.8   The DETI-led interventions have drawn on funding from the EU, UK Government and Northern Ireland Executive sources.

2.9   In addition, in June 2015 the Department of Agriculture and Rural Development announced a further £2m investment in broadband through its Rural Development Programme. The funding aims to improve broadband provision in hard-to-reach areas that are unlikely to benefit from fixed-line solutions. Applications for funding will be led by councils in partnership with local communities.

2.10   Work is ongoing, supported by the UK and devolved Governments, to extend high quality broadband access to as many consumers as possible. In November 2015 the UK Government announced that work was commencing to introduce a universal service obligation (USO) of 10Mbit/s with a consultation planned for early 2016. Details of Ofcom's work in this area are available in the main Connected Nations Report.

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[3] Figure from BT Northern Ireland

Fixed networks in urban and rural areas

**Figure 3: Download, upload and data usage in urban and rural areas of Northern Ireland**

	Average download sync speeds (Mbit/s)	Average monthly data usage (GB)	Average upload speeds (Mbit/s)	Average data use during peak time (Mbit/s)
Northern Ireland	28	77	4	26
Northern Ireland Urban	32	85	5	28
Northern Ireland Rural	18	57	4	17

Source: Ofcom analysis of operator data

Data usage declines with sync speeds

2.2   In line with overall trends and previous Ofcom research, premises in rural Northern Ireland which have lower speeds available to them tend to also use less data over the course of a month.

Figure 4: Download speeds and data use in urban and rural areas
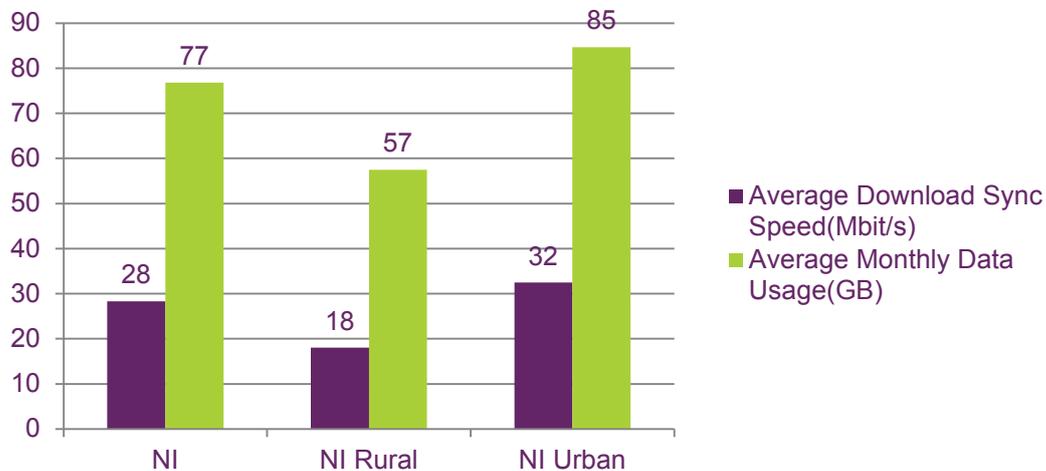
Source: Ofcom analysis of operator data

2.3   The chart below shows areas where both SFBB and non-SFBB speeds are available. In areas where SFBB services are available, the usage differential is less marked as shown in Figure 5.

Figure 5: Download speeds and data use in urban and rural areas with superfast availability

Source: Ofcom analysis of operator data

2.4　People in rural areas see a greater deterioration in speeds due to longer line lengths. Figure 6 also shows that rural consumers are served mainly by BT. There are some smaller operators who offer services in rural areas but they would not be of a scale that would see Ofcom routinely collect data from them. In this report we use new data gathered from the largest operators in each sector, as well as information already held by Ofcom. For fixed networks, we used input from the four largest networks.. In the case of mobile networks we gathered data from all the network operators. Virgin Media's network is only available to 27% of premises in Northern Ireland and the coverage footprint is limited to Greater Belfast and Derry/ Londonderry

Figure 6: NGA and superfast availability in urban and rural areas by operator

	Virgin Media NGA availability	Virgin Media SFBB availability	BT NGA availability	BT SFBB availability
Northern Ireland	27%	27%	92%	73%
Northern Ireland Urban	38%	38%	93%	87%
Northern Ireland Rural	0%	0%	90%	40%

2.5　As the USO at 10 Mbit/s has become a reality in policy terms and as the superfast rollout programmes move forward, the UK and devolved governments are considering how to tackle the issues faced by households in the more remote and rural areas of the UK with plans specifically directed at the 'last 5%'.

2.6   Unsurprisingly, rural areas have the greater number of lines currently incapable of supporting speeds of above 10 Mbit/s but the SFBB rollout programmes are causing this picture to change rapidly. In Northern Ireland, 2% of premises in urban areas and 42% of premises in rural areas cannot currently achieve speeds greater than or equal to 10Mbit/s.

Figure 7: Percentage of premises that can receive 2, 5 and 10Mbit/s in urban and rural areas
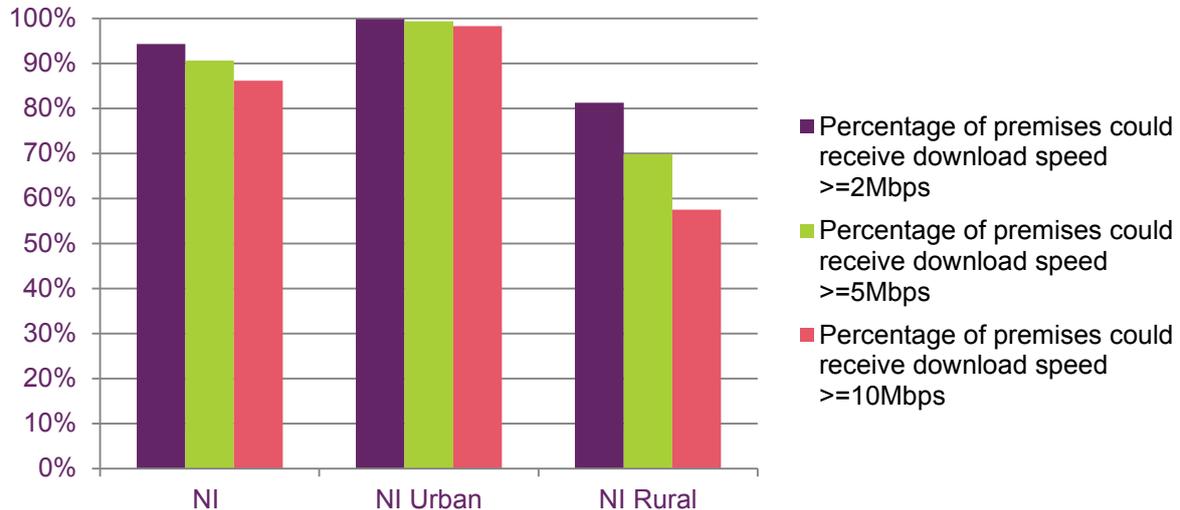
Access to broadband for small businesses in Northern Ireland

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

2.8   Good connectivity is important for businesses of all sizes. In broad terms, larger enterprises are able to afford dedicated fibre based services to meet their needs so here we focus on provision for businesses with 249 or fewer employees – referred to as Small and Medium Enterprises (SMEs).

2.9   Due to non-availability of SME premise location in Northern Ireland we have been unable to collect superfast broadband coverage data for 2015, and therefore are unable to show a year-on-year comparison. It should be noted that the number of SMEs operating in Northern Ireland dropped by 2% between 2014 and 2015.[4] This is a sizable decrease considering that SMEs account for 99% of the total business population in Northern Ireland.

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[4] http://researchbriefings.parliament.uk/ResearchBriefing/Summary/SN06152#fullreport

Figure 8: Analysis of superfast broadband coverage for SMEs in Northern Ireland

	2014
Total superfast coverage, premises	77%
Superfast coverage for SMEs with 1 or more employees, premises	69%

Source: Ofcom analysis of operator data

Figure 9: Analysis of superfast coverage for SMEs in Northern Ireland by business size
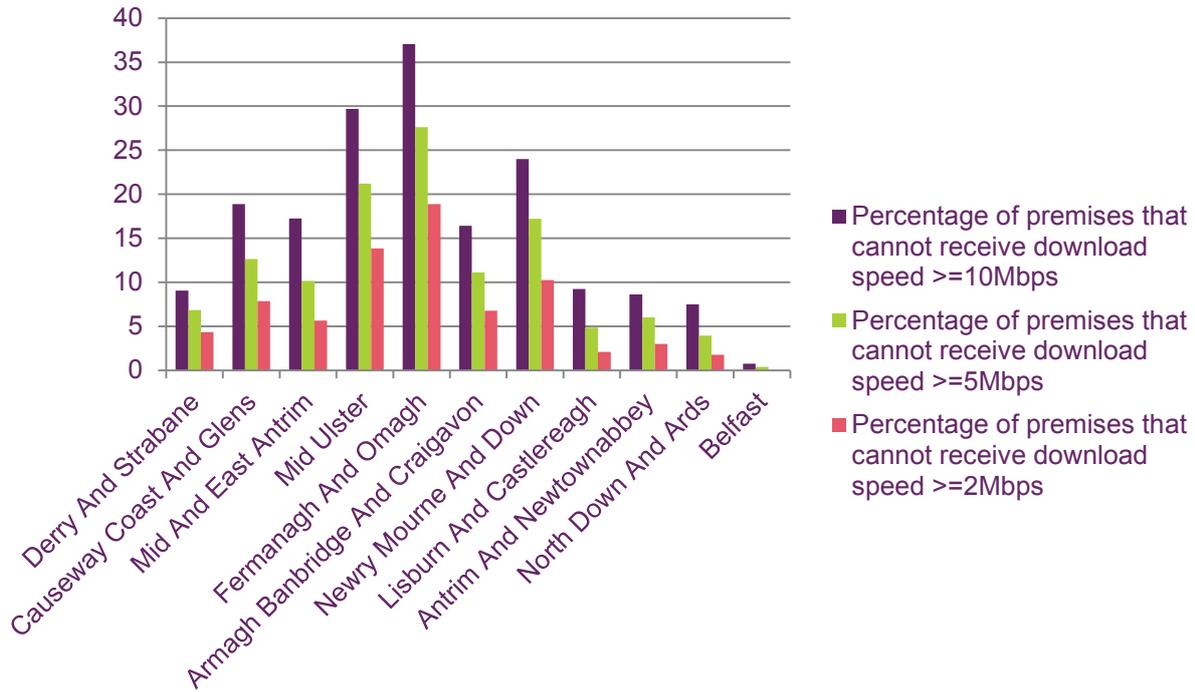
	2014
Superfast coverage for SMEs with 1 or more employees, premises	69%
Micro (excluding sole traders)	67%
Small	74%
Medium	74%

Source: Ofcom analysis of operator data

Data at Local Authority level in Northern Ireland

2.10   This section provides an overview of some of the data available at local authority level in Northern Ireland. Maps which cover more data at a local authority level are here http://maps.ofcom.org.uk/.

2.11   Following the Review of Public Administration, Northern Ireland's new council structures came into effect in April 2015. This saw the number of councils reduced from 26 to 11. The new councils have taken on additional responsibilities in areas such as planning and economic development. As a result, the new councils are taking an active interest in the current availability of, and future development plans for, the telecoms infrastructure in their districts.

2.12   One of the measures we consider to be of interest to local authorities is how far each area could be from reaching the 10Mbit/s universal service obligation recently confirmed by UK Government.

Figure 10: The percentage of premises unable to get 2, 5 and 10 Mbit/s by local authority area

Legend:
- Percentage of premises that cannot receive download speed >=10Mbps
- Percentage of premises that cannot receive download speed >=5Mbps
- Percentage of premises that cannot receive download speed >=2Mbps

Source: Ofcom analysis of operator data

2.13   Looking in more detail at those locations which would need service enhancements to reach the proposed USO level of 10Mbit/s, it should be noted that the superfast broadband rollout programme is at a midpoint and some of the premises included in these figures will see improvements as the phased rollouts continue.

2.14   Fermanagh and Omagh, and Mid Ulster see the greatest deficits in coverage at speeds that would fulfil the USO. In these areas, around a third or more of premises would need to see speed enhancements to reach the proposed USO level. The costs associated with this will vary depending on topography, available backhaul and other essential connection needs.

Figure 11: The percentage of premises that cannot receive a download speed greater than 10Mbit/s
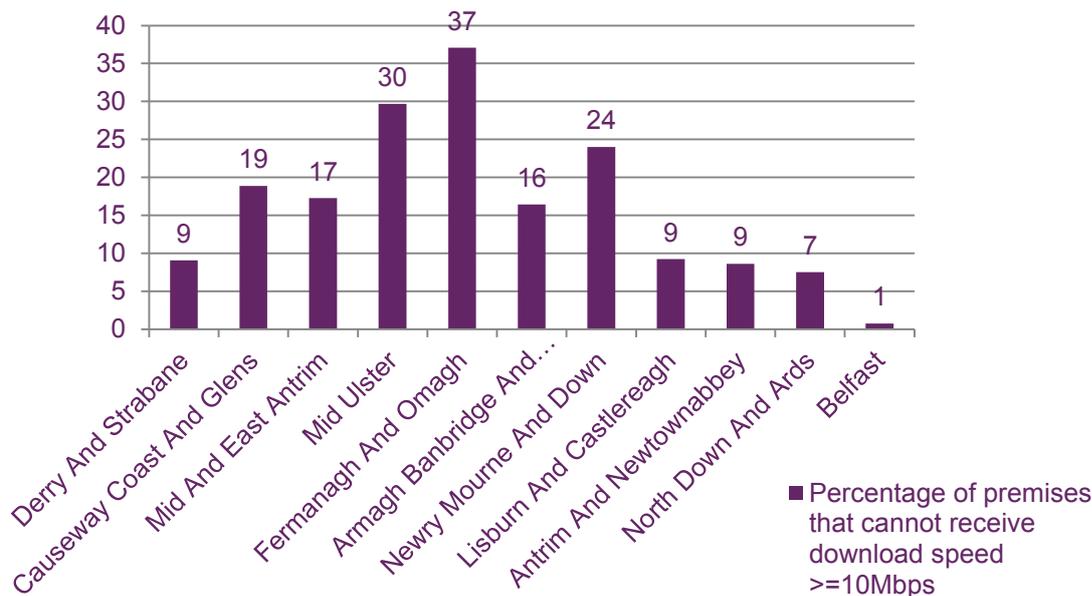
Source: Ofcom analysis of operator data

2.15   Ofcom, operators and governments have been aware of and reporting on the differential between speeds in urban and rural areas for some time. Even where superfast speeds are available in rural areas they tend to be slower than in urban areas due to the dispersion of premises and the distance of premises from cabinets with a FTTC solution. The graph below outlines this speed differential for both SFBB and non-SFBB connections, and for urban and rural areas.

Figure 12: Superfast speeds and non-superfast speeds by urban and rural settlement types
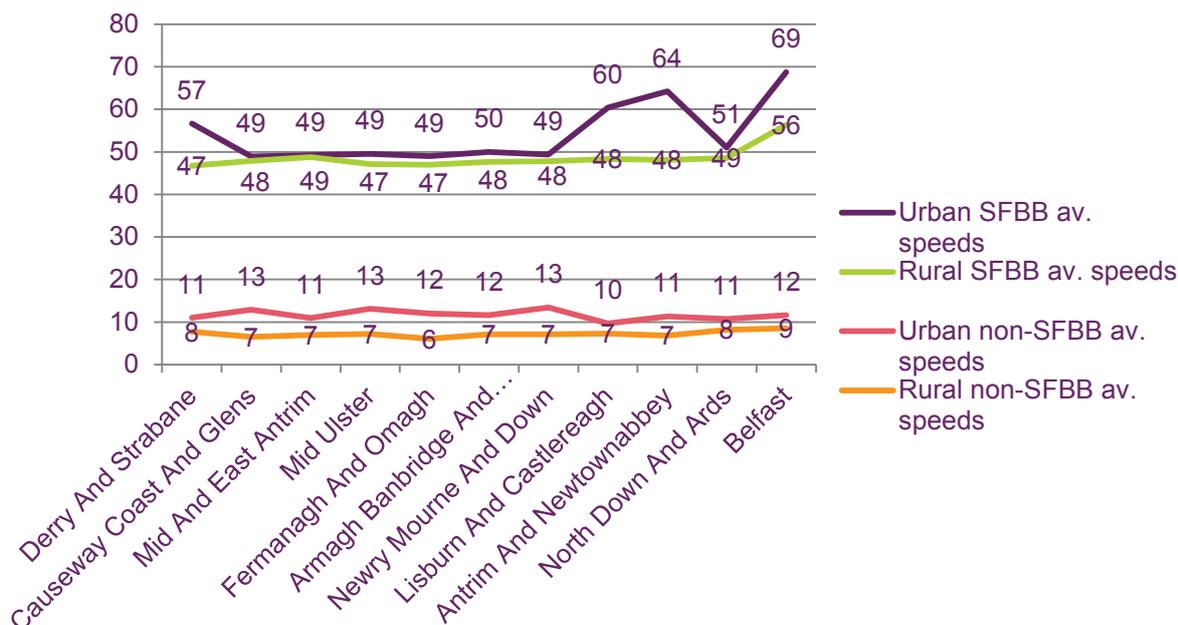
Source: Ofcom analysis of operator data

Fixed Broadband

2.16   Due to the nature of the Digital Subscriber Line (DSL) technologies commonly used to support broadband services on traditional telcoms networks, the distance between the consumer's premises and exchange or street cabinet will affect the speeds that the connection can support; longer lines cannot support speeds as high as shorter lines.

2.17   Given the geography and population densities of different areas of the UK it is clear that there will be locations where the length of the line to individual premises will mean that delivery of even 10Mbit/s[5] becomes very difficult, if not impossible, via fixed means. Alternative technologies such as satellite and wireless deployments could ultimately form part of the solutions in the nations to connect these premises. As detailed in the main report, we consider 10Mbit/s the effective threshold for what constitutes an acceptable level of broadband service to meet current consumer expectations and use.

2.18   Work is ongoing, supported by the UK and national Governments, to extend high quality broadband access to as many consumers as possible.

2.19   The actual number of premises that may benefit from the USO is yet to be determined. As rollouts progress and technology develops, more is being learned about the possibilities of extending the reach of services in a sustainable and cost-effective way.

Superfast Broadband

2.20   Each of the devolved governments in the nations has added funds to the additional rollout of superfast broadband beyond commercial deployments. Ofcom fulfils an advisory role to governments on these projects, providing information and data on current service availability and the structure of the relevant markets.

2.21   The funding for these projects has come from a variety of sources but is largely based on contributions from the UK Government, devolved governments and assemblies, local authorities in the relevant areas and private investment from BT and other delivery contractors. There are also some projects that utilise European Union funding. In total, across the UK over £1.7 billion has been invested to support and extend coverage of superfast broadband.[6]

2.22   A major challenge to the roll out of superfast services is the longer line lengths in the access network across the UK. The distances between exchanges and premises reflect the lower population densities and disparate nature of dwellings in the nations and rural areas of England such as Northumberland, Cumbria, Devon and Cornwall compared to the UK average. These distances cause serious deterioration of the physical properties of the broadband signal resulting in slower data speeds, meaning that even when fibre-connected cabinets are built, superfast speeds are not always available to the end user.

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[5] As detailed in the main report, we consider 10 Mbit/s the effective threshold for what constitutes an acceptable level of broadband service to meet current consumer expectations and use.
[6] PQ220396 [on broadband], 12 January 2015

2.23   As projects have rolled out the geographic and topographic challenges of the different areas of the UK have become evident. On top of the issues already understood with reaching universal availability across the UK, the population spread and density as well as geographic features have presented additional factors to overcome in order to roll out as high a quality of service possible to as many premises as possible at a reasonable cost per premise.

2.24   The map in Figure 13 was used in the Ofcom publication, "The availability of communications services in the UK", published in 2013. It is reproduced again here as it offers a useful insight into why availability and rollout is not uniform across the UK.

Figure 13: Light pollution in the UK
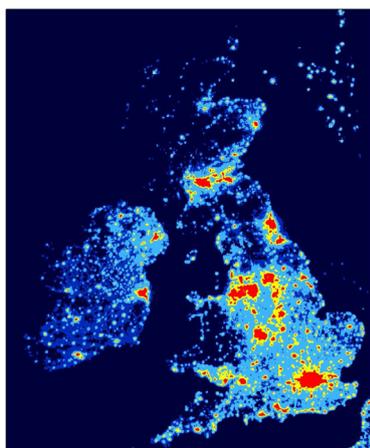
Source: Campaign to Protect Rural England

2.25   The map shows light pollution in the UK which offers an insight into where premises are located. It shows that in each of the component nations the spread of premises can be different which affects how communications services are rolled out and the costs associated with doing this.The difference between Next Generation Access and the availability of superfast speeds

2.26   For example, Scotland's population is concentrated in a "J" shape that runs across the Central Belt (Glasgow and Edinburgh), up the east coast (Dundee and Aberdeen) and then along the Moray Firth (to Inverness). There are other reasonably dense centres of population across the rest of Scotland, but these are small and widely spaced. Wales presents a similar pattern of highly concentrated population centres with smaller and more widely spaced conurbations across the landmass. Northern Ireland has a different pattern with what is described as 'a house in every field'. This is partly the result of differences in local planning regulations which have permitted a proliferation of single dwellings in rural areas. These contrast with much of England, where there is much more of a grid effect with large centres of population and gradually diminishing population densities between them.

2.27   The effect is most keenly felt in Northern Ireland where the rural population is most evenly spread. The result is that Northern Ireland has the longest average line lengths and four times the UK average number of telegraph poles per capita.

Mobile services in Northern Ireland

Scorecard for 2015

2015	Northern Ireland	UK
Indoor voice premises (coverage by all 4 operators)	68%	85%
Outdoor voice premises (coverage by all 4 operators)	89%	77%
Indoor data premises (coverage by all 4 operators)	57%	77%
Outdoor data premises (coverage by all 4 operators)	73%	88%
Indoor voice premises (complete not-spots)	4%	2%
Outdoor voice premises (complete not-spots)	1%	<1%
Indoor data (complete not-spots)	5%	3%
Outdoor data (complete not-spots)	1%	<1%
Geographic voice (coverage by all 4 operators)	66%	58%
Geographic data (coverage by all 4 operators)	43%	38%
Geographic voice (Complete not-spots)	5%	13%
Geographic data (Complete not-spots)	7%	21%

3.1   It is recognised that mobile coverage varies across the UK and is generally less good in rural than in urban areas. The decision to offer mobile coverage in a particular area is essentially a commercial judgement by the mobile network operators. Profitability will depend on the likely demand for mobile services as well as the costs of providing these services. The main drivers of local availability are likely to be differences in the density and composition of the local population and the topography of the local area. The UK Government is seeking to address geographic coverage via the deal brokered with the mobile network operators late in 2014 to secure 90% voice coverage across the UK landmass by the end of 2017.

3.2   Earlier in 2015, Ofcom created and published a set of interactive maps which provide searchable data of 2G, 3G and 4G mobile coverage at postcode level across the UK. We have raised the thresholds at which we assess the quality of mobile coverage and have further developed the metric, which illustrates what type of service will be available to consumers in their area .

3.3   The data presented here offers a snapshot at the national level in Northern Ireland but more granular analyses are available using the online mapping tool which is available on the Ofcom website at http://maps.ofcom.org.uk/. The site allows consumers to provide feedback in order to make improvements to the maps so that they reflect consumers' experience across the UK as accurately as possible.

Mobile coverage (premises) in Northern Ireland 2014-2015 by operator

3.4   There are some variations between the coverage provided by the individual operators and consumers can seek to assess their own usage patterns and compare this with Ofcom or operator assessments of coverage before taking out any contract.

3.5   This year we have presented the data on coverage in a way that is intended to better reflect what people actually want to use their mobile service for: so rather than reporting on 2G, 3G and 4G services separately the measures of these services are provided in an integrated way, as they are on the devices which are used to access them. Devices enable use of either voice services (to make calls and send texts), or data services (which would enable all internet use or web applications). In reporting on voice services we have looked more closely at the real signal strength required to offer an adequate consumer experience. This gives a more tangible measure of consumers' experience but limits the comparability of data between 2014 and 2015 on voice coverage. The 2014 figures in the table below have been re-analysed to reflect our new 'experience-led' measurement so will not match coverage data in previous Ofcom reports. Overall, EE provides the most comprehensive voice and data coverage in Northern Ireland, however this is subject to locational variation and other performance issues of handets outlined earlier in this document.

Figure 14: Premises coverage of voice and data networks in Northern Ireland by operator

	EE		H3		O2		Vodafone	
	2015	2014	2015	2014	2015	2014	2015	2014
Indoor Voice (2G/3G)	85%	85%	85%	85%	86%	87%	80%	76%
Outdoor Voice (2G/3G)	96%	96%	96%	96%	96%	96%	94%	92%
Indoor Data (3G/4G)	89%	88%	85%	85%	90%	79%	63%	50%
Outdoor Data (3G/4G)	97%	96%	96%	96%	91%	89%	76%	64%

Source: Ofcom analysis of operator data

Mobile coverage (geographic) in Northern Ireland 2015 by operator

3.6   The coverage data allows us to make an assessment of which operator has the most geographically widespread network in Northern Ireland with the same constraints on interpretation as before over handset performance and the issues presented by some geographic features such as valleys and dense forestation.

3.7   The data suggests that EE currently has the widest geographic coverage in Northern Ireland, with some operators below this level. It should be noted that the UK Government's geographic coverage target of 90% applies across the UK and is not a Northern Ireland-specific target and that while O2 holds the coverage obligation for data on the 4G network to cover 95% of each of the nations by the end of 2017, this obligation applies only to premises coverage rather than geographic coverage.

Figure 15: Geographic coverage of voice and data networks in Northern Ireland by operator

Geographic coverage	EE	H3	O2	Vodafone
Voice (2G+3G)	87%	81%	82%	81%
Data (3G+4G)	88%	81%	69%	52%

Source: Ofcom analysis of operator data

Mobile Not-Spots in Northern Ireland

3.8   There remain some areas of Northern Ireland not covered by all four operators and some with no mobile communications coverage at all. Mobile communications have been very dynamic in the UK due to the rollout of major infrastructure sharing programmes between the operators, UK Government intervention, including the £5 billion geographic coverage commitment from operators, and consolidation within the industry. The rollout of new data services using 4G technology has seen extensive upgrades to the operators' mast networks that, whilst creating overall improvements, have seen pockets of fluctuation in coverage across the different voice and data technologies in some areas.

3.9   In geographic terms, Northern Ireland has less voice not spots than the UK as a whole (13%) and substantially less than Scotland where 29% of landmass is not covered. A not-spot is defined as an area not covered by any operator. A similar pattern can be seen when looking at data coverage. Northern Ireland has 7% of its landmass not covered by a data service from any operator, compared to the UK average of 21%.

Figure 16: Partial and complete not-spots, coverage by all operators

	2015					
	Indoor Voice (premises)	**Outdoor Voice (premises)**	**Indoor Data (premises)**	**Outdoor Data (premises)**	**Voice (geog).**	**Data (geog.)**
Partial Not-Spots	29%	10%	38%	25%	29%	50%
Complete Not-Spots	4%	1%	5%	1%	5%	7%
Premises covered by all operators	67%	89%	57%	73%	66%	43%

Source: Ofcom analysis of operator data

Mobile networks in urban and rural areas

3.10   Complete and partial not spots are more prevalent in rural areas. This reflects the relative population densities in these areas.

Figure 17: Urban and rural premises voice coverage

		Indoor Voice (2G + 3G)	**Outdoor Voice (2G + 3G)**
Partial Not-Spots	Urban	16%	2%
	Rural	61%	27%
Complete Not-Spots	Urban	<1%	0%
	Rural	14%	3%
Premises covered by all operators	Urban	84%	98%
	Rural	26%	69%

Source: Ofcom analysis of operator data

Mobile networks on roads in Northern Ireland

Figure 18: Road coverage across all operators

	EE		H3		O2		Vodafone	
	Voice (2G+ 3G)	Data (3G+4G)	Voice (2G+3G)	Data (3G+4G)	Voice (2G+3G)	Data (3G+4G)	Voice (2G+3G)	Data (3G+4G)
Motorways	96%	98%	95%	95%	97%	86%	90%	63%
A&B Roads	75%	78%	67%	67%	64%	49%	56%	29%

Source: Ofcom analysis of operator data

3.11   As discussed within the main Connected Nations Report there are a number of elements that can impact consumers' experience of mobile telecoms including geography, whether they are situated indoors or outdoors, signal strength and the reception performance of the individual handset.

Basic voice and text services - 2G

3.12   2G services have seen slow incremental growth reflecting their maturity in the market. However, we expect the UK Government's agreement with the MNOs, announced in December 2014, to secure investment to take geographic coverage to 90% of the UK landmass will lead to further availability of voice and text services in the nations of the UK.

3.13   The agreement does not specify individual targets for each nation of the UK. Across the UK a relatively low number of premises, around 4% remain unable to access voice services from all operators.

Voice, text and data services - 3G

3.14   3G services offering access to data have lower premises and geographic coverage across all areas of the UK. Mobile network operators offering 3G services have coverage obligations built into their licences to cover 90% of premises in the UK. This figure was increased in 2013 from 80% in exchange for changes to duration of licences.

3.15   Northern Ireland has historically had lower levels of 3G coverage than other nations. This was primarily the result of Northern Ireland having high levels of community opposition to mobile phone masts and the introduction of tighter planning restrictions at the time of the initial 3G rollout. However, the number of premises covered by all four 3G operators has increased by 10 percentage points in Northern Ireland over the past year, bringing Northern Ireland closer to the rest of the UK for 3G coverage.

3.16   The popularity of smartphones has increased during the past few years. Consumers' expectation of their mobile device is also greater – consumers expect to be able to use their mobile phones to access information and data wherever they are, at home and on the move.

High speed data services - 4G

3.17 In 2013, Ofcom conducted the first auction of its kind – the auction of spectrum to support high speed 4G mobile broadband services. 4G licences in the UK are subject to the highest coverage obligation ever placed upon a mobile operator in this country requiring one license holder to reach:

- 98% indoor coverage across the UK by the end of 2017, and;

- 95% indoor coverage in each of the nations of the UK by the end of 2017.

3.18 Rollout has been rapid in highly populated areas and 77% of premises across the UK can access high-speed mobile data services via either the 3G or 4G network. Operators are now beginning to upgrade their 4G networks to support voice calling, as well as high speed data services.

3.19 Coverage of both fixed and mobile networks is very dynamic as government intervention programmes and consolidation within the mobile market presents new opportunities to enhance coverage. This report forms part of an update to the UK Government on the current state of infrastructure across the UK. Ofcom provides data on coverage, take-up and of communications services use through a number of research and analysis publications throughout the year which can be found on the Ofcom website.