Connected Nations

Wales Report 2024

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Overview

Ofcom's objective is to make communications work for everyone, including to promote reliable, widely available and high-quality networks. In this annual Connected Nations report for Wales, we measure progress on the availability of broadband and mobile services across Wales and the UK. This includes providing updates on the roll-out of the full fibre, fixed wireless access and 5G mobile networks.

Alongside this Wales report, we are also publishing separate reports on broadband and mobile availability for the UK as a whole and each of its other nations. Our interactive dashboard allows people to easily access the latest data for different areas of Wales and the UK and in relation to specific services.

What we have found

Broadband

Access to full-fibre networks has reached 1 million homes in Wales or 68% of residential premises, up 13 percentage points from last year (55%). Gigabit-capable broadband has increased 10 percentage points from last year to 74%. This is the biggest increase across all UK nations.

Take-up of services on full-fibre networks has risen over the last year. There was an increase of 8 percentage points in take-up as a proportion of all premises where full fibre is available, from 31% reported last year to 39% this year. This equates to an increase of 170,000 full-fibre connections (residential and business) in Wales.

The number of premises that still cannot access decent broadband from fixed-line or fixed wireless networks has remained static at around 8,000 premises in Wales. We estimate that around 1,000 of these premises will be connected via publicly funded schemes by December 2025, leaving around 7,000 premises without decent broadband coverage and potentially eligible for the Universal Service Obligation (USO).

Availability of full fibre varies greatly across constituencies in Wales. The Westminster constituencies with the highest levels of full fibre availability include Alyn & Deeside (92%), Bridgend (91%) and Clwyd North (88%); whilst the constituencies with the lowest level of full fibre availability are Rhondda & Ogmore (36%), Brecon, Radnor & Cwm Tawe (41%), Caerfyrddin (45%), Ynys Môn (45%) and Ceredigion Preseli (48%).

- Some customers are taking up alternate broadband options delivered over wireless and satellite networks. In Wales, 93% of customers can access a Fixed Wireless Access (FWA) service from a Mobile Network Operator (MNO), while 22% can access FWA from a Wireless Internet Service Provider (WISP). This is a high proportion compared to the UK as a whole, where only 7% of premises on average have FWA coverage from WISPs.

Mobile

5G is reaching a growing number of consumers, with Wales seeing a steady increase in coverage. Coverage from at least one MNO now reaches 86% (High Confidence) and 79% (Very High Confidence) in areas outside of premises.[1]

4G geographic coverage in Wales has increased significantly during the past year as the individual MNOs continue to incrementally extend their networks. Their coverage now ranges from 83-89% (up from 73-85% in 2023) partly reflecting the work they are undertaking to deliver their Shared Rural Network obligations.

Rural parts of Wales have seen a 13 percentage points increase in 4G geographic coverage from all four MNOs to 72%, the second highest across the nations, after Scotland. Urban areas of Wales remain well served by 4G networks at 94% coverage.

Dwyfor Meirionnydd (63%), Bangor Aberconwy (66%), Brecon, Radnor & Cwmtawe (66%), Ceredigion Preseli (69%) and Montgomeryshire & Glyndwr (70%) are among the new Westminster constituencies in Wales with the lowest availability of 4G geographic coverage from all operators. Constituencies with the highest levels of 4G geographic coverage include Cardiff East (99%+), Swansea West (99%+), Newport East (99%), Cardiff North (98%) and Cardiff West (98%). There is good 4G geographic coverage from at least one MNO across all Westminster constituencies in Wales.

[1] Please refer to our *Background to mobile technologies* box in this report where these levels are defined

Fixed broadband and voice services in Wales

Full-fibre fixed networks are continuing to expand across Wales, delivering faster and more reliable broadband and voice services to homes and businesses. In this section, we provide an update on the rollout and consumer take-up of services on these networks over the past year. We also provide updates on the deployment of fixed wireless and satellite networks that are delivering alternative forms of broadband connectivity, as well as providing the latest data on the small remaining numbers of premises that still do not have access to decent broadband.

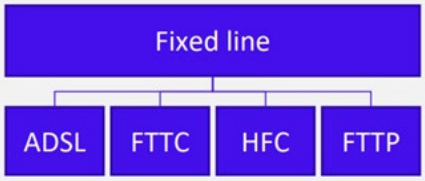
Growing connectivity across Wales and the rest of the UK is taking place in the context of broader changes to the fixed telecoms sector, including the migration to digital voice technology from the legacy public switched telephone network (PSTN). For more information on these developments, please refer to our Connected Nations 2024 report for the UK as a whole.

Figure 2.1: Summary of broadband coverage at a fixed location across the UK and nations

	Gigabit-capable (residential)	Full fibre (residential)	Superfast (residential)	Unable to get decent (all properties)
UK	83%	69%	98%	0.2%
Scotland	77%	62%	96%	0.5%
Northern Ireland	94%	93%	98%	0.2%
Wales	74%	68%	96%	0.5%
England	84%	69%	98%	0.1%

Source: Ofcom analysis of operator data (July 2024)

Background: fixed-line broadband services



Fixed connections provide broadband access at specific locations, such as residential or business premises. Fixed-line broadband technologies can be broken down into different technology types.

There are **four** primary types of fixed-line connections for fixed broadband access:

- **Asymmetric Digital Subscriber Line (ADSL)** – Copper (telephone) cables are used to connect the exchange to each premises. Maximum download speed is up to 24 Mbit/s. Actual speeds delivered diminish with length of cable from exchange to the premises.
- **Fibre to the cabinet (FTTC)** – FTTC involves fibre to the street cabinet, with copper cables connecting the cabinet to the premises. FTTC uses 'very high-speed digital subscriber line' (VDSL) technology.[2] As with ADSL, speeds diminish with length of cable, but as cabinets are generally located close to premises, maximum download speed is normally up to 80 Mbit/s.
- **Hybrid fibre coaxial (HFC)** cable – With HFC, there is fibre to a street cabinet and coaxial cable from the cabinet to the premises. Because coaxial has less signal loss than telephone copper wires, HFC can deliver higher speeds over longer distances. Cable broadband in the UK is provided by Virgin Media O2, and its cable network can deliver gigabit speeds.[3]
- **Full fibre or 'fibre to the premises' (FTTP)** – The connection from the telephone exchange to the premises is provided entirely over fibre. Generally, distance to the premises does not affect the speed delivered. Full fibre can deliver gigabit speeds.[4]

We categorise fixed broadband connections based on the download speed they can provide:

- **Decent** – can provide at least 10 Mbit/s download and 1 Mbit/s upload speeds.[5] It can be delivered by ADSL, FTTC, HFC cable or full fibre. Decent broadband provides sufficient speeds for making a high-definition video call. Over minimum decent broadband, downloading a one-hour HD TV episode (1 GB) would take almost 15 minutes.

[2] Another technology known as G.fast is also sometimes deployed at, or near, a limited number of cabinets offering higher speeds than VDSL.
[3] Cable broadband HFC access networks are shared between a large number (usually hundreds) of premises.
[4] Most full-fibre access networks utilise Passive Optical Network (PON) approaches where capacity in the downstream and upstream direction is shared between around 30 to 60 users.
[5] The UK Government defines the characteristics of 'decent broadband'. This is the level of connection currently deemed necessary for consumers to participate in a digital society.

- **Superfast** – can provide download speeds of at least 30 Mbit/s and can be delivered by FTTC, HFC cable or full fibre. Superfast broadband provides sufficient speed for one-person streaming 4K/UHD video. Downloading a one-hour HD TV episode would take under four and a half minutes and several devices can work simultaneously.
- **Gigabit-capable** – can offer download speeds of 1 Gbit/s and above. It can be delivered by HFC cable or full fibre. With gigabit-capable broadband, it is feasible to download a full 4K film (100 GB) in under 15 mins, or a one-hour HD TV episode in eight seconds.

Full-fibre broadband is now available to a million residential premises (68%) in Wales

There has been a significant increase in the availability of full-fibre networks in Wales, with one million homes (68%) able to access full-fibre broadband as of July 2024. This is an increase of 13 percentage points, or nearly 200,000 premises, compared to September 2023.

There are differences in full-fibre coverage between rural and urban areas, with residential premises in urban areas in Wales more likely to have access to full-fibre networks (74% for urban areas, and 48% for rural areas respectively). Residential premises in rural areas of Wales have seen a 7 percentage points increase in access to full fibre.

Table 2.1: Residential full-fibre and gigabit-capable network coverage

	Full fibre			Gigabit capable		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
England	69% (17.3m)	71% (15.6m)	52% (1.7m)	84% (21.1m)	88% (19.4m)	54% (1.7m)
Northern Ireland	93% (0.8m)	96% (0.6m)	86% (0.2m)	94% (0.8m)	97% (0.6m)	86% (0.2m)
Scotland	62% (1.7m)	67% (1.5m)	42% (0.2m)	77% (2.1m)	85% (1.9m)	43% (0.2m)
Wales	68% (1.0m)	74% (0.8m)	48% (0.2m)	74% (1.1m)	81% (0.9m)	49% (0.2m)
UK	**69% (20.7m)**	**71% (18.5m)**	**52% (2.2m)**	**83% (25.0m)**	**88% (22.7m)**	**54% (2.3m)**

Source: Ofcom analysis of provider data (July 2024).

Increased coverage of full fibre continues to be driven primarily by the commercial rollout of Openreach's network and also some alternative providers.

Under Project Gigabit, the UK Government will make £170 million available through its contract with Openreach to deliver gigabit-capable broadband to around 70,000 premises in hard-to-reach areas across Wales.[6]

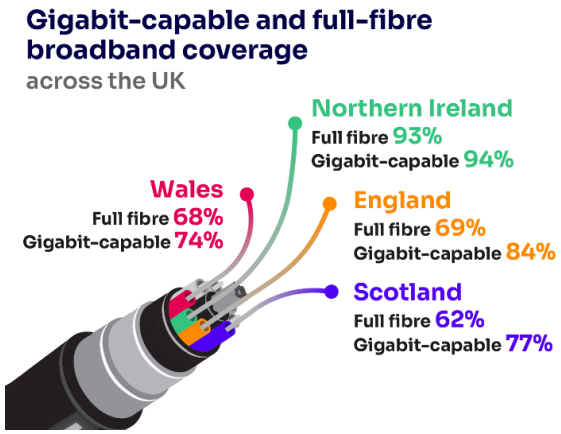
Openreach has continued its Fibre Community Partnership Scheme, announcing recently that it had started work to build a new ultrafast broadband network in Pendine, Carmarthenshire, with residents pooling together UK Government Vouchers, contributing to the cost of the build.[7] Also, as a result of the scheme, Llanbrynmair in Powys claimed to be the 'first telephone exchange area in the UK' on Openreach's network to have 100% full-fibre broadband coverage, meaning that the 500 or so properties in the village can now access Openreach's fibre to the premises. Openreach claims that more than 59 communities, making up nearly 33,000 properties in some of the most rural parts of the country, could take advantage of this ultrafast upgrade as a result of the scheme.[8]

Meanwhile, Ogi reports that it has continued to build its high-speed full fibre network across parts of south Wales and has to date covered over 100,000 mostly residential premises in towns and villages in Bridgend, Pembrokeshire, Monmouthshire and Caerphilly.[9] Supported by ongoing equity investment, Ogi recently secured a new £45 million financing package from Cardiff Capital Region. Ogi said this funding will enable it to extend its reach in the ten local authority areas that make up the Cardiff Capital Region, where it already has an established presence.

In addition, another altnet provider, Voneus, is also deploying full fibre (and Fixed Wireless Access) in rural parts of Wales, using the Gigabit Voucher Scheme including most recently in the coastal village of Dale in Pembrokeshire.[10]

[6] https://www.gov.uk/government/news/bandwidth-boost-for-70000-homes-and-businesses-as-uk-government-vows-to-fix-broadband-divide-in-wales
[7] https://newsroom.carmarthenshire.gov.wales/2024/08/openreach-get-set-to-bring-ultrafast-speeds-back-to-pendine/
[8] https://www.openreach.com/news/llanbrynmair-residents-sing-the-praises-of-ultrafast-broadband/
[9] https://ogi.wales/news/one-in-five-now-online/
[10] https://www.thinkbroadband.com/news/10320-vouchers-bring-full-fibre-to-dale-in-pembrokeshire

Gigabit-capable broadband is now available to 74% of residential premises in Wales



Source: Ofcom analysis of provider data (July 2024)

Gigabit-capable broadband can be delivered over both full-fibre and HFC technologies; therefore, the increase in full-fibre coverage in Wales has also increased the number of premises able to access gigabit-capable broadband. By July 2024, 74% or 1.1 million residential premises in Wales had access to a gigabit-capable broadband network. This is an increase of 10 percentage points, compared to September 2023.

Take-up of services on full-fibre networks is rising

An increasing number of customers are using available broadband services as the coverage of full-fibre networks expands. As a percentage of all premises with access to full fibre, Wales has seen an increase of 8 percentage points in take-up to 39% (up from 31%), a relatively larger increase than the UK average in the past year. Take-up of services on full-fibre networks where available is lower than Wales in England (33%) and Scotland (35%) while Northern Ireland leads the nations at 53%.

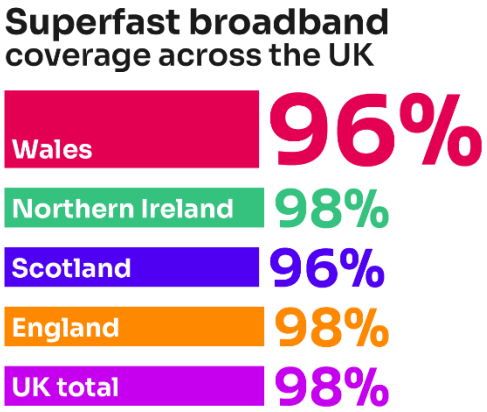
Table 2.2: Estimated full-fibre broadband take-up as a percentage of premises where full-fibre networks are available by nation: 2021-2024

	2021	2022	2023	2024
England	25%	25%	27%	33%
Northern Ireland	19%	25%	39%	53%
Scotland	22%	23%	28%	35%
Wales	24%	28%	31%	39%
UK	**24%**	**25%**	**28%**	**35%**

Source: Ofcom analysis of provider data (July 2024)

We noted that where available, take-up of full fibre is considerably higher in rural areas than in urban areas so far. Of premises with full fibre access, 55% of premises in rural areas have taken full fibre, compared to 36% in urban areas.

The vast majority of homes in Wales have access to superfast broadband



Source: Ofcom analysis of provider data (July 2024).

Most residential premises in Wales have access to superfast broadband services. This is defined as a broadband connection that can provide download speeds of at least 30 Mbit/s. Our 2024 data show that the proportion of residential premises with access to superfast broadband has remained stable at 96% of residential premises in Wales.

Table 2.3: Residential superfast coverage by nation, July 2024

	Total	Urban	Rural
England	98%	99%	90%
Northern Ireland	98%	99%+	95%
Scotland	96%	99%	83%
Wales	96%	99%	87%
UK	**98%**	**99%**	**89%**

Source: Ofcom analysis of operator data (July 2024).

There is vast improvement in full-fibre availability across the Welsh Westminster constituencies, but significant variations remain

The deployment of superfast and full-fibre broadband is generally more difficult and costly in rural areas than in larger towns and cities. This is primarily as a result of the greater distances between infrastructure nodes, small settlements and individual properties, plus the comparatively lower number of customers that can be connected.

A new set of boundaries for Westminster constituencies was used for the 2024 UK general election, with the number of constituencies in Wales reduced from 40 to 32. Only Ynys Môn remained unchanged. Superfast broadband coverage, and even more so, full-fibre availability varies greatly between the 32 new Welsh constituencies as outlined in Table 2.4.

Two constituencies have full-fibre availability greater than 90% - Alyn and Deeside (92%) and Bridgend (91%) – and another five have availability levels of over 80% - Clwyd North (88%), Caerphilly (84%), Cardiff North (84%), Cardiff South and Penarth (84%), and Newport West and Islwyn (80%)

The predominantly urban constituency of Rhondda and Ogmore has the lowest availability of full fibre in Wales at 36% - and there are a further four constituencies in Wales where full-fibre coverage remains below 50%. They are Brecon, Radnor and Cwm Tawe (41%), Caerfyrddin (45%), Ynys Môn (45%) and Ceredigion Preseli (48%).

Superfast broadband coverage in 29 of Wales's 32 parliamentary constituencies is now at least 90% with 20 having coverage of 98% and above. Both Cardiff West and Swansea West have 99%+ coverage and 13 other constituencies have 99% coverage.

The lowest levels of superfast coverage are in the predominantly rural constituencies of Caerfyrddin (85%), Ceredigion Preseli (86%) and Brecon, Radnor and Cwm Tawe (88%).

Table 2.4: Residential superfast broadband and full-fibre availability in each of the Welsh Westminster constituencies (as a percentage of the premise base)

Local authority	Superfast (>=30Mbit/s) availability	Full-fibre availability
Aberafan Maesteg	99%	65%
Alyn and Deeside	99%	92%
Bangor Aberconwy	94%	65%
Blaenau Gwent and Rhymney	98%	53%
Brecon, Radnor and Cwm Tawe	88%	41%
Bridgend	99%	91%
Caerfyrddin	85%	45%
Caerphilly	99%	84%
Cardiff East	99%	71%
Cardiff North	99%	84%
Cardiff South and Penarth	98%	84%
Cardiff West	99%+	71%
Ceredigion Preseli	86%	48%

Local authority	Superfast (>=30Mbit/s) availability	Full-fibre availability
Clwyd East	96%	71%
Clwyd North	98%	88%
Dwyfor Meirionnydd	92%	54%
Gower	98%	67%
Llanelli	97%	76%
Merthyr Tydfil and Aberdare	99%	73%
Mid and South Pembrokeshire	96%	60%
Monmouthshire	93%	72%
Montgomeryshire and Glyndwr	90%	59%
Neath and Swansea East	99%	58%
Newport East	99%	78%
Newport West and Islwyn	99%	80%
Pontypridd	98%	63%
Rhondda and Ogmore	99%	36%
Swansea West	99%+	79%
Torfaen	99%	69%
Vale of Glamorgan	99%	84%
Wrexham	97%	67%
Ynys Môn	94%	45%

Source: Ofcom analysis of provider data (July 2024)

Fixed wireless access networks provide another option for many customers in Wales

In addition to the fixed-line technologies discussed above, it is also possible to receive fixed broadband services via wireless networks, called Fixed Wireless Access (FWA). FWA can be delivered by MNOs, on licensed 4G and 5G networks, and by Wireless Internet Service Providers, which communicate via a wireless link between a provider's mast site and an external antenna fixed to a customer's premise.

In Wales, 93% of customers can access an FWA service from an MNO,[11] while 22% can access FWA from a WISP. FWA coverage via WISPs in Wales is high compared to the UK as a whole, where only 7% of premises, on average, have FWA coverage from WISPs. Several factors may impact coverage figures, for example, some WISPs are migrating customers to their full-fibre networks and withdrawing some wireless sites, and one WISP indicated a change in their reporting model, thus potentially impacting figures on overall WISP coverage for example in Wales, where there has been a drop in coverage during the past year (from 31% in 2023).

[11] Our reporting here is based on data from BT/EE and Three – see the annex in the UK report for further information on the methodology.

Table 2.5: Coverage of MNO and WISP FWA networks with at least decent broadband (all premises)

	MNO FWA	WISP FWA
England	96%	6%
Northern Ireland	84%	3%
Scotland	95%	2%
Wales	93%	22%
UK	**95%**	**7%**

Source: Ofcom analysis of provider data (July 2024).

Take-up of satellite broadband is increasing and may offer an alternative in poorly served areas

Satellite technologies continue to evolve rapidly, and Low Earth Orbit (LEO) satellites particularly could potentially help to serve parts of the UK which are harder to reach through more traditional technologies. LEO satellites can offer high-speed, lower-latency services relative to traditional geostationary (GSO) satellites.

The UK Government is supporting satellite broadband trials to deliver high-speed connections to harder-to-reach locations in Wales.[12] For example, Ogwen Valley Mountain Rescue Organisation is a voluntary mountain rescue team responding to incidents in the mountains and valleys surrounding the Ogwen Valley, Glyderau, and Carneddau mountain ranges in Eryri. This site was chosen as LEO satellite technology can help improve safety of the volunteers at the base as well as support their life-saving operations. The Cornel Scout Centre situated at the head of Llyn Crafnant, in Eryri, was chosen as LEO satellite technology can help improve safety for wardens and the public traversing the isolated 25-acre site as well as enabling new educational resources for visiting school, university or scout groups.

The LEO retail market is at an early stage of development and take-up remains low compared to terrestrial broadband services, though it is increasing.

Starlink currently offers the only direct-to-consumer LEO service in the UK through its retail product. This offers nationwide broadband coverage, including in harder-to-reach areas. In addition, Business-to-Business services are available from OneWeb. At the time of writing, we have authorised a total of 6 LEO operators to provide broadband services in the UK so we expect further development in both Business-to-Consumer and Business to-Business markets as these operators start to launch satellites and services in the coming years.[13]

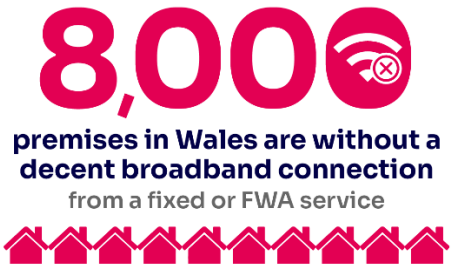
[12] DSIT, https://www.gov.uk/government/publications/very-hard-to-reach-premises-alpha-trials/very-hard-to-reach-premises-alpha-trial-case-studies, 22 February 2024.

[13] Information about existing Non-GSO (NGSO) satellite systems which are licensed in the UK and applications that we have received can be found on Ofcom's website.

The data provided to us by Starlink indicates there are around 5,000 connections in Wales making use of LEO satellites for their broadband service up from around 3,000 last year.

The number of premises in Wales unable to access decent broadband has remained broadly stable at 8,000

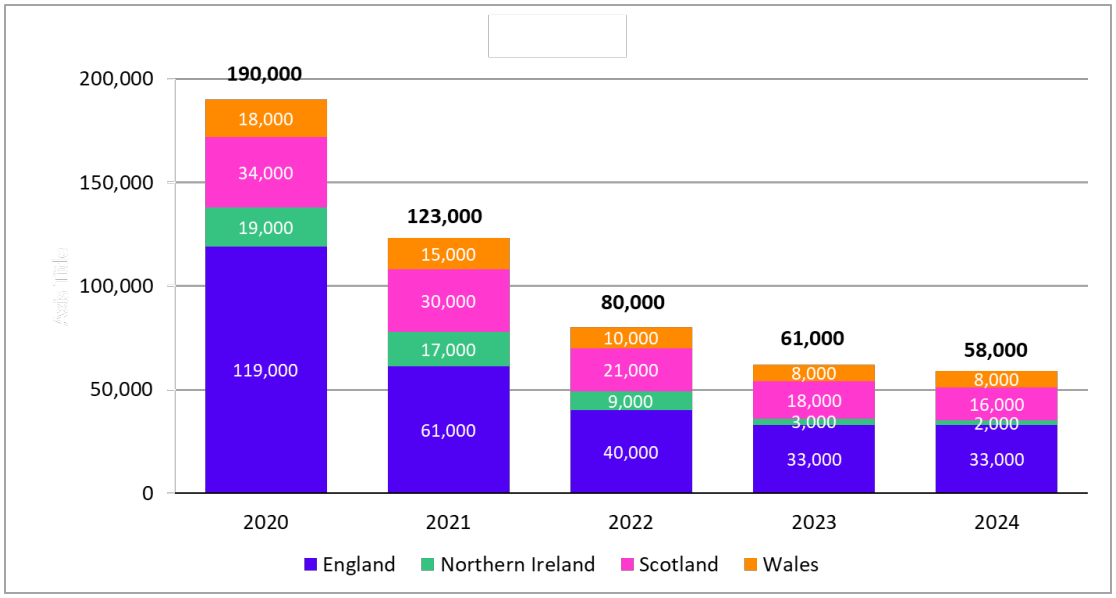
We estimate that 2% of homes and businesses in Wales cannot access decent broadband, which is defined as a connection which provide at least 10 Mbit/s download speed and 1 Mbit/s upload speed, from a fixed-line connection. This is around 35,000 premises, slightly down from last year when we reported that 36,000 premises did not have decent broadband via a fixed-line.



Source: Ofcom analysis of provider data (July 2024)

Of those premises that do not have decent broadband via fixed-lines, some will be able to access decent broadband via fixed wireless access services offered by MNOs or WISPs. Taking account of the coverage available from FWA, we estimate that this leaves around 0.5% or 8,000 premises in Wales without a decent broadband service from either fixed-line or fixed wireless networks. This is similar to the figure we reported last year.

Figure 2.2: Approximate number of premises without access to a decent broadband service from either a fixed or Fixed Wireless Access network, 2020-2024[14]



Source: Ofcom analysis of provider data (July 2024)

The universal service obligation (USO) can offer decent broadband to some premises without current access

The broadband USO provides all premises with the right to request a broadband connection with a download speed of at least 10 Mbit/s and an upload speed of 1 Mbit/s (as well as several other specific technical characteristics).[15]

Where an affordable service with these characteristics is not available or is due to become available in the next 12 months under a publicly funded scheme, the customer is eligible for the USO if the costs of providing the connection are below £3,400.[16] Where the costs are above £3,400, the customer has the option to pay the excess costs to get a USO connection. BT is the universal service provider for the UK (excluding Hull), and KCOM for the Hull area. They are required to provide the USO and to report at six monthly intervals on delivery.[17]

As of September 2024, BT had received 247 USO orders in Wales (out of just over 2,000) across the UK) since the launch of the USO in March 2020. Each order requires network build that can serve

[14] All figures have been rounded to the nearest 1,000.
[15] In particular these characteristics are: (i) a contention ratio of no more than 50:1; (ii) latency which is capable of allowing the end user to make and receive voice calls effectively; and (iii) the capability to allow data usage of at least 100 GB a month.
[16] In March 2020, we specified in the USO conditions that an affordable service was one that costs £45 per month, rising annually by CPI. This has now risen to £56.20 per month in line with CPI.
[17] BT, USO Reports. KCOM, USO Reports. To date, we understand that KCOM has not received any eligible USO orders.

multiple premises, and therefore these orders will lead to full-fibre connections being built that can serve over 10,000 premises.[18]

Table 2.6: USO orders and number of premises built by nation across the UK

2024	Number of USO Orders	Total premises passed by resulting build
England	1,558	7,478
Northern Ireland	89	726
Scotland	115	540
Wales	247	1,334
UK	**2,009**	**10,078**

Source: Ofcom analysis of BT data (September 2024).

The increase in the number of USO since last year's Connected Nations report was very small, including less than ten new orders in Wales up to September 2024. Data analysis by BT has indicated that the cost of connecting nine out of ten of the remaining premises without access to decent broadband are likely to exceed the £3,400 threshold. In these cases, customers will receive excess cost quotes that may be quite high and, in most cases, unaffordable for customers. Those premises that are the most expensive to connect are likely to need alternative solutions.

To ensure the broadband USO remains relevant, a review provision was included in the legislation and the process to review is likely to be triggered when superfast broadband is taken up by at least 75% of all premises.[19] As of July 2024, 75% of all UK premises have taken up superfast broadband.

In October 2023, the Government consulted on a review of the broadband USO and we will continue to engage with Government on the future approach to the USO.

Ofcom's September Planned network deployment update set out industry's estimated progress over the next 3 years

Ofcom gathers stated deployment plans from network operators. in September 2024, we published our latest forward-looking update on planned network deployment.

This update is based on operators' deployment plans within three years from May 2024, for both full-fibre and fixed wireless access networks and includes plans that are funded privately or supported through public funds.

[18] BT's public reporting shows a slightly lower number of total confirmed orders. This is because it only covers orders prior to, and during, network build, whereas the 2,009 figure also includes orders made once build has completed.

[19] Under the Communications Act 2003, the Secretary of State is likely to issue Ofcom with a direction to review the broadband USO if it appears to them that, on the basis of information we have published, take-up of superfast broadband has reached at least 75% of all UK premises.

The update found the total number of residential premises expected to have full-fibre coverage in 2027 could be as high as 95% of all residential premises in Wales (96% UK), while 95% of residential premises in Wales (98% UK) could have gigabit-capable coverage.

Our estimates indicate that there could be around 4,000 premises in Wales that continue to be without access to decent broadband from fixed-line or fixed wireless networks in May 2027.

Table 2.7: Estimated number of remaining premises unable to access decent broadband by May 2027

	May 2027
England	14,000
Northern Ireland	1,000
Scotland	7,000
Wales	4,000
UK	**26,000**

Source: Ofcom analysis of operator data (May and July 2024).

Mobile Data and Voice

Mobile coverage is continuing to expand across the UK, ensuring that more people can access the benefits of reliable mobile services.

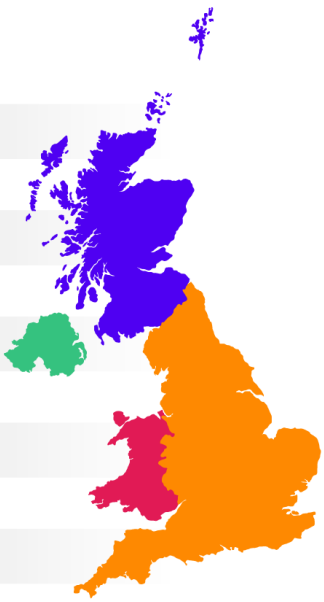
In this section, we provide an update on the progress MNOs are making with their 5G rollout plans in Wales. We also report on the availability of 4G mobile coverage across Wales – which continues to underpin the mobile experience for consumers – both outside and inside premises and across its landmass.

We recommend that this section is read in conjunction with the mobile, data and voice section in the Connected Nations 2024 UK report.

Summary of mobile coverage

Figure 3.1: Overview of voice and data coverage across the UK

	5G outside premises (MNO range)	4G outside premises (MNO range)	4G geographic (MNO range)	4G total not spots	Voice and text total not spots
UK	61-79%	99-99+%	88-89%	5%	3%
Scotland	54-76%	99-99+%	77-80%	11%	7%
Northern Ireland	36-90%	98-99%	89-95%	2%	<1%
Wales	16-80%	98-99%	83-89%	5%	3%
England	65-81%	99-99+%	94-96%	1%	1%



Source: Ofcom analysis of operator data (September 2024)

Background to mobile technologies

Mobile services described in this section include:

- **5G, the current generation of wireless technology**, is faster than previous generations of wireless technology, as it offers greater capacity, allowing an increased number of devices to be connected at the same time in a small area. It is also more responsive by reducing latency which is the time between instructing a wireless device to perform an action and that action being completed.
- **5G non-standalone (5G NSA)** involves deploying 5G radio equipment alongside existing 4G and is supported by the 4G core network. This delivers an increase in capacity and allows MNOs to support demand as it continues to grow, without the congestion and degradation of service quality that would otherwise result.
- **5G standalone (5G SA)** involves the deployment of a new 5G core network. This could enable new use cases such as Augmented Reality (AR) /Virtual Reality (VR) and robotics, supported by the broader capabilities of 5G including ultra-low latency, advanced virtual network (slicing) functions,[20] and potentially improved coverage.[21] 5G SA referred to in this chapter is specifically in relation to mobile standalone deployment.

When reporting on 5G mobile availability predictions, we refer to confidence ranges[22] reflecting the likelihood of on the ground coverage for consumers as:

- **High Confidence** associated with a signal strength (-110 dBm), to equate to at least an 80% confidence level.
- **Very High** Confidence associated with a higher signal strength (-100 dBm), to equate to a circa 95% confidence level.
- **4G, 3G and 2G** are older generations of mobile standards with specified features. In particular, 3G supported the use of data applications such as web browsing, while 4G has supported more data intensive activities such as streaming and gaming.

[20] Network slicing is a feature of 5G SA networks that allows an MNO to create multiple virtual networks (slices) on top of its common shared physical infrastructure. The virtual networks are then customised to operate with specific quality of service and meet the specific needs of applications, services, devices, customers or operators.

[21] Augmented Reality (AR): an enhanced version of the real physical world that is achieved through the use of digital visual elements, sound, or other sensory stimuli delivered via technology. It overlays digital content, which could include a combination of sound, video, text, and graphics, onto a real-world environment using a headset or a device with a camera, such as a mobile phone.
Virtual Reality (VR): use of a headset to access a virtual experience, which could be digitally created or a captured 360° photo or video.

[22] Signal strength measured on the 4G common reference signal and 5G secondary synchronisation block – for further detail see our Methodology annex.

Mobile coverage

Outdoor premises coverage of 5G in Wales

The availability of 5G, which is the area where consumers can connect to a 5G network, continues to grow, although it varies considerably by MNO and nation. In 2024, there has been an increase in 5G coverage in Wales, as measured by at least one MNO offering coverage. This metric now reaches 86% (High Confidence) and 79% (Very High Confidence) in areas outside of premises. This is an improvement from 83% and 72%, respectively, in 2023 but availability in rural areas remains considerably lower than in urban areas.[23]

Figure 3.2: The MNO range for 5G coverage outside premises at the high confidence level

The footprint where all MNOs provide 5G coverage remains considerably lower, with only a slight increase since September 2023, now covering 14% of premises at High Confidence and 8% at Very High Confidence, up from 10% and 6%, respectively. Wales has the lowest 5G availability outside of premises from at least one MNO and from all MNOs at High Confidence and Very High Confidence. 5G coverage by these measures is well below the UK average, as outlined in Table 3.1.

Table 3.1: Outdoor premises 5G coverage across the UK

	High Confidence		Very High Confidence	
Nation	At least one MNO	All MNOs	At least one MNO	All MNOs
Wales	86%	14%	79%	8%
Urban	91%	17%	86%	10%
Rural	68%	2%	57%	1%
England	96%	40%	92%	20%

[23] 5G coverage figures reported in this chapter are slightly lower than the actual 5G coverage due to data inconsistencies affecting 5G standalone reported by one of the MNOs during the later stages of our publication process. We are looking into the effect of this at both the UK and nations level to determine if an update is needed.

	High Confidence		Very High Confidence	
Northern Ireland	92%	20%	86%	8%
Scotland	91%	34%	85%	16%
UK	95%	38%	90%	19%

Source: Ofcom analysis of operator data (September 2024).

Geographic coverage for 5G has increased and this year we found that coverage from at least one MNO was available to 52% of Wales's landmass at the High Confidence level and 42% at Very High Confidence. This is up from 48% and 35% respectively from September 2023. Coverage from all MNOs however remains at very low levels, with 5G only available to less than 1% of Wales's landmass at the Very High Confidence level.

Table 3.2: Geographic 5G coverage across the UK

	High Confidence		Very High Confidence	
Nation	At least one MNO	All MNOs	At least one MNO	All MNOs
Wales	52%	1%	42%	<1%
England	76%	7%	62%	3%
Northern Ireland	71%	2%	59%	<1%
Scotland	33%	1%	24%	<1%
UK	60%	4%	48%	2%

Source: Ofcom analysis of operator data (September 2024).

Coverage varies across MNOs

BT/EE has the most extensive 5G coverage in Wales at the Very High Confidence level, reaching around 39% of Wales geographically and 74% outdoor premises coverage. There has been a substantial increase of 14 percentage points in BT/EE's 5G outdoor premises coverage in the last year.

At the High Confidence level, 5G geographic coverage from individual MNOs ranges from 2% to 47% and from 16% to 80% for outdoor premises coverage.

4G geographic coverage across Wales has increased significantly since 2023

It is important to note that most people still use voice and data services through older technologies, especially 4G. 4G remains the main network provided by MNOs.

4G geographic coverage in Wales has increased significantly since 2023 from 73–85% to 83-89%. The percentage coverage by MNO is now 89% (85% in 2023) for BT/EE, 83% (73%) for Virgin Media O2, 88% (78%) for Three, and 84% (74%) for Vodafone. See also the discussion about the Shared Rural Network below.

The level of 4G landmass coverage by at least one mobile network operator rose to 95% from 91% 2023. Significant differences remain in geographic 4G coverage across the UK's nations. As of September 2024, MNOs provided geographic coverage ranging from 83-89% (73-85%) in Wales.

Table 3.3: 4G geographic coverage ranges by UK nation

Nation	Range of 4G Geographic Coverage
Wales	83% to 89%
England	94% to 96%
Northern Ireland	89% to 95%
Scotland	77% to 80%
UK	**88% to 89%**

Source: Ofcom analysis of MNO predictions (September 2024)

4G geographic coverage in Wales from all four MNOs has increased significantly by 13 percentage points (from 62% to 75%).

Table 3.4: 4G geographic coverage from all MNOs by UK nation

Nation	% of landmass served by all operators (2023)	% of landmass served by all operators (2024)	Percentage points (ppt) change
Wales	62%	75%	+ 13ppt
England	85%	90%	+5ppt
Northern Ireland	81%	85%	+4ppt
Scotland	48%	65%	+17ppt
UK	**71%**	**80%**	**+9ppt**

Source: Ofcom analysis of MNO predictions (September 2024)

Rural geographic 4G coverage across Wales from all four MNOs has increased significantly by 13 percentage points from 59% to 72% since September 2023. Urban areas of Wales remain well served by 4G networks at 94% coverage, up 2 percentage points.

Table 3.5: 4G geographic coverage from all MNOs by Urban/Rural

Nation	Total	Urban	Rural
Wales	**75**% (+13ppt)	94% (+2ppt)	72% (+13ppt)

Source: Ofcom analysis of MNO predictions (September 2024)

Levels of 4G geographic coverage (per Table 3.5) from at least one MNO has also improved in rural areas of Wales, increasing from 90% coverage in 2023 to 95% as of September 2024.

The proportion of Wales's landmass which has no 4G coverage from any operator ('not-spots') has dropped from 9% in 2023 to 5% in 2024. Table 3.6 provides a comparison of Wales's complete 4G not-spots against other UK nations, with the overall UK not-spot area having reduced by two percentage points to 5% in 2024.

Table 3.6: Complete 4G not-spots by UK nation

Nation	% of 4G not-spots
Wales	5%
England	1%
Northern Ireland	2%
Scotland	11%
UK	**5%**

Source: Ofcom analysis of MNO predictions (September 2024)

There are differences in geographic coverage across the new Westminster constituencies

There are differences in 4G geographic coverage across the new Westminster constituencies. 4G geographic coverage from all four MNOs in the new Westminster constituencies cannot be directly compared with previous years except in the case of Ynys Môn, the only Welsh constituency to remain unchanged in the boundary changes (79% 2023, 90% 2024).

Constituencies with the highest levels of 4G geographic coverage from all four MNOs include Cardiff East (99%+), Swansea West (99%+), Newport East (99%), Cardiff North (98%), and Cardiff West (98%). The constituencies with the lowest availability include the predominantly rural constituencies of Dwyfor Meirionnydd (63%), Bangor Aberconwy (66%), Brecon, Radnor and Cwm Tawe (66%), Ceredigion Preseli (69%), and Montgomeryshire and Glyndwr (70%). There are high levels of 4G geographic coverage from at least one MNO across all Westminster constituencies.

Table 3.7: 4G geographic (all operators) coverage by new Westminster constituency

Westminster constituency	4G Geographic coverage from at least one MNO	4G Geographic coverage from all MNOs
Aberafan Maesteg	99%	84%
Alyn and Deeside	99%+	93%
Bangor Aberconwy	95%	66%
Blaenau Gwent and Rhymney	99%+	96%
Brecon, Radnor and Cwm Tawe	92%	66%
Bridgend	99%+	95%
Caerfyrddin	97%	74%
Caerphilly	99%+	97%
Cardiff East	99%+	99%+

Westminster constituency	4G Geographic coverage from at least one MNO	4G Geographic coverage from all MNOs
Cardiff North	99%+	98%
Cardiff South and Penarth	99%+	94%
Cardiff West	99%+	98%
Ceredigion Preseli	95%	69%
Clwyd East	99%+	90%
Clwyd North	99%	94%
Dwyfor Meirionnydd	91%	63%
Gower	99%	83%
Llanelli	99%+	88%
Merthyr Tydfil and Aberdare	99%	83%
Mid and South Pembrokeshire	99%+	89%
Monmouthshire	96%	77%
Montgomeryshire and Glyndwr	94%	70%
Neath and Swansea East	99%+	87%
Newport East	99%+	99%
Newport West and Islwyn	98%	94%
Pontypridd	99%	92%
Rhondda and Ogmore	99%	85%
Swansea West	99%+	99%+
Torfaen	99%	91%
Vale of Glamorgan	99%+	93%
Wrexham	99%+	93%
Ynys Môn	99%+	90%

Source: Ofcom analysis of MNO predictions (September 2024)

Outdoor premises coverage remains high

Individual MNOs continue to provide a high level of 4G coverage outside of premises in Wales, with coverage ranging between 98 – 99% of premises. In addition, 97% of premises have outdoor 4G coverage from all four operators, compared with 99% across the UK. Table 3.6 provides a comparison between Wales and other UK nations.

Table 3.8: Outdoor premises 4G coverage by UK nation (all operators)

Nation	% of outdoor premises with 4G coverage from all four MNOs	Percentage points change from September 2023
Wales	97%	+3ppt
England	99%	0ppt
Northern Ireland	97%	+1ppt

Nation	% of outdoor premises with 4G coverage from all four MNOs	Percentage points change from September 2023
Scotland	98%	+1ppt
UK	**99%**	**+1ppt**

Source: Ofcom analysis of MNO predictions (September 2024)

In rural areas, individual operators' 4G coverage outside premises ranges from 94% to 97%, a notable improvement from last year's 88% to 96%. However, a disparity persists between urban and rural coverage as each MNO continues to cover over 99% of urban premises.

Update on Shared Rural Network (SRN)

On 9 March 2020, the UK Government announced that it had entered into an agreement with the four MNOs to grant funding for a Shared Rural Network (SRN). Under the terms of this agreement, each of the four MNOs has committed to provide good quality 4G data and voice coverage to 88% of the country's landmass by 30 June 2024, and 90% by 31 January 2027.[24]

On 12 September 2024, Ofcom published an update on the compliance of the UK's MNOs with their SRN coverage obligations. For Wales we confirmed that all four MNOs had met their individual threshold (83% for BT/EE and Three, and 82% for VMO2 and Vodafone), with 4G coverage levels as per 30 June 2024 reported at 87% for BT/EE, 84% for Three, 83% for VMO2 and 82% for Vodafone.'This assessment was informed by coverage predictions submitted by the MNOs for the time these obligations fell due, and Ofcom's subsequent measurement work.[25]

Indoor coverage continues to be widely available

Indoor 4G coverage now serves 90-95% of premises in Wales across different MNOs, an improvement from last year's 86-94%. There has been a slight reduction in indoor voice call availability since last year, from 94-98% to 93-98%. Despite a considerable improvement in 4G indoor coverage in rural areas, significant differences remain between rural and urban areas, as shown in Table 3.9 below.[26]

Table 3.9: 4G and voice indoor coverage across MNOs in rural and urban areas

	4G		Voice	
	2023	**2024**	**2023**	**2024**
Urban	92-98%	93-98%	98-99%+	98-99%+

[24] Good quality coverage is defined as the ability to sustain a 90 second voice call and access data speeds of at least 2 Mbps, with a methodology to assess this based on a 4G signal of at least -105 dBm.
[25] https://www.ofcom.org.uk/siteassets/resources/documents/spectrum/spectrum-information/mobile-coverage-obligation/shared-rural-network-compliance-methodology.pdf?v=369242
[26] Ofcom determines indoor coverage by applying an average building entry loss of 10dB across buildings. We acknowledge this approach provides only a simplified view of indoor coverage and that the real experience depends heavily on the types of building material and insulation in a specific building.

Rural	68-82%	77-83%	83-92%	77-94%
Total	86-94%	90-95%	94-98%	93-98%

Source: Ofcom analysis of MNO predictions (September 2024).

Where indoor coverage is poor or unreliable, other solutions can improve the user experience. These include broadband-based voice or video calls on services such as WiFi calling, online communications services such as instant messaging and calling applications, or femtocell.[27] All MNOs offer WiFi calling, although not all phones are configured to support this.

Table 3.10 below outlines that indoor 4G coverage from all MNOs is 80% in Wales, third among the four nations, and up from 76% in 2023.

Table 3.10: Indoor premises 4G coverage by UK nation

Nation	At least one MNO	All operators
Wales	99%	80%
England	99%+	88%
Northern Ireland	99%	74%
Scotland	99%+	89%
UK	99%+	88%

Source: Ofcom analysis of MNO predictions (September 2024).

3G switch-off is underway

All MNOs made a commitment to the UK Government to switch off their 2G and 3G networks by 2033 at the latest. This will result in improved network efficiency and enable more spectrum to be used for faster 4G and 5G services.

In February 2023 we set out a number of expectations on mobile providers on 3G and 2G switch off, which are designed to ensure that customers are treated fairly and any disruption to customers is minimised.

The MNOs are responsible for their own switch-off timetables for these legacy technologies, with 3G being switched off first, and this year saw Vodafone and EE both complete their respective 3G switch-offs.

Ofcom has received very few complaints from customers about the impact of 3G switch off, and MNOs have not reported any significant disruption related to the switch to Ofcom. Three is in the process of switching off 3G, and Virgin Media O2 plans to switch off its 3G services in 2025. We will continue to closely monitor these switch-off processes through to completion.

[27] WiFi calling is the ability to make and receive a call and text/SMS over a WiFi network. A femtocell is a small low-power cellular base station connected to the phone network over the internet.