

# Mobile Connectivity advice for consumers

One in a series of Digital Connectivity Guides

*A guide providing mobile connectivity  
advice for residents and business*



**worcestershire**  
county council

# Mobile Connectivity advice for consumers

Mobile signal and service availability is an important utility in today's connected world - often considered to be the 4th utility. Currently there are four different "generations" of mobile technology: **2G**, **3G**, **4G** and **5G**, with **6G** on the horizon. The table below gives approximate values for comparison.

		<b>2G</b>	<b>3G</b>	<b>4G</b>	<b>5G</b>
<b>Year introduced</b>		1990	2000	2010	2020
<b>Switch-off by (in UK)</b>		2033	2024	N/A	N/A
<b>Download Speed</b>	<b>Theoretical (max)</b>	473.6Kbps	42Mbps	3Gbps	20Gbps
	<b>Practical (avg)</b>	50Kbps	8Mbps	100Mbps	300Mbps
<b>Upload Speed</b>	<b>Theoretical (max)</b>	473.6Kbps	11.5Mbps	1.5Gbps	10Gbps
	<b>Practical (avg)</b>	50Kbps	2Mbps	50Mbps	100Mbps
<b>Latency (end to end)</b>		600 MS	120 MS	30 MS	<12 MS

There are four main **Mobile Network Operators (MNOs)** operating in the UK, these are **EE**, **O2**, **Three** and **Vodafone**. The other operators you may be aware of (such as supermarket brands) are known as **Mobile Virtual Network Operators (MVNOs)** who then have agreements with one of the main MNOs to provide you with a service.

Consumers expect uninterrupted cellular (mobile) services in homes, places of business and other venues. However, the nature of mobile communications infrastructure and the business / commercial decisions that drives its investment, planning and deployment means that this expectation is not always met by service providers.

From a regulatory perspective, the national regulator, **Ofcom**, imposes population or outdoor geographic coverage obligations on MNOs that requires the operators to provide mobile coverage to certain percentage of the UK landmass or population. However, the implementation processes to achieve the set targets and therefore the distribution of sites and infrastructure are left to the operators to decide, leading to areas with less economic benefits for the operators such as rural settlements more susceptible to poor mobile coverage. There are no current requirements around 'quality of experience' and often issues can occur due to matters around network optimisation and areas of high demand.

Infrastructure sharing arrangements such as the proposed Shared Rural Network venture in the UK will significantly lower network deployment costs and are expected to serve as an impetus to improve outdoor coverage in rural settlements such as those found in parts of Worcestershire.

Poor or unreliable In-premises (indoor) coverage continues to be a challenge for many consumers. There are certain steps that can be taken by mobile service consumers to improve mobile coverage in homes, venues, and businesses.

# Mobile Connectivity advice for consumers

## Do I have the best service and am I maximising its potential?

Whether you are coming to the end of a mobile contract, looking for a new contract or want to see if you are getting what your service provider has stated you would get, check out the **Ofcom indoor / outdoor mobile availability online checker**: [checker.ofcom.org.uk/en-gb/mobile-coverage](https://checker.ofcom.org.uk/en-gb/mobile-coverage).

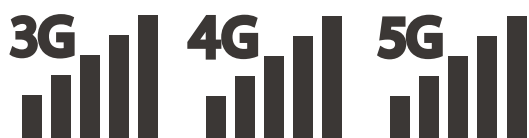
## View mobile availability

Use of this checker is subject to **Ofcom's terms of use** (<https://www.ofcom.org.uk/about-ofcom/websites/terms-of-use>).

Please enter your post code below to view the predicted mobile availability in your area, or click the button to enable the site to find your location.

There is also an interactive map view of coverage from the four network operators – EE, Vodafone, O2 and Three for Voice, Data and 5G Data. Other sources such as **MastData**: [www.mastdata.com](http://www.mastdata.com) and **Open Signal** [www.opensignal.com](http://www.opensignal.com) have coverage and maps for comparison.



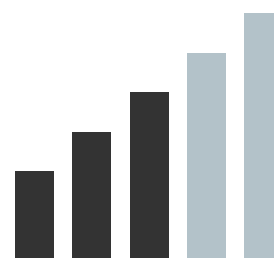
## 2G and 3G networks

2G and 3G networks are coming to their end of life. UK providers are looking to switch-off their 3G networks between 2023 and 2024, while they have all agreed to switch-off 2G by 2033.

If you have an older device – check under “mobile networks” or “mobile data” to see if an option showing 4G is available – however, if you do not have this option you will need to update your mobile so you can continue to access data services.

Upgrading to a 4G or even 5G handset and service will also allow you to access what is known as **Voice over Long Term Evolution (VoLTE)** calling. VoLTE calling uses 4G technology to carry voice signals, this enables you to make voice calls if there is a 4G service but poor 2G and 3G service.

## How can I improve my mobile signal? Check the Signal Strength on your mobile



You will probably already be aware of the best place within your premises to make and receive mobile calls and access the internet. This will be because this location will be closest to the broadcasting tower with the strongest signal (at that time) and will have less barriers for the signal to pass through (ie walls, windows, even trees). Masts are known to “breathe” which is where the signal strength range will vary; for example depending on how many people are linking to the mast at the same time (ie rush hour traffic accessing the mast), weather conditions such as wind strength and direction, etc; all play a role in how good a signal you get at any specific time.

If you are looking to place a signal booster device, a mobile Wi-Fi unit or just use your mobile phone in the best location, you can access a service within your phone to show live signal strength data – shown as dBm (decibels per milliwatt).

- **If you have an iPhone**  
Dial **\*3001#12345#\*** and press the call button. You’ll get a secret Field Test mode. Then press the Home button, briefly in the top left hand corner where the signal bars usually are, there’s a number which represents the dBm figure.
- **For Android devices**  
Go to the ‘Settings’ app, select ‘About Phone’, then select ‘Status’ or / and ‘Sim Status’, then you should see ‘Signal strength’ with a dBm figure, or you may need to select ‘Signal Strength’ to see it.

# Mobile Connectivity advice for consumers

Walk around your property and record the dBm figure that your phone is getting for a specific location. If you want to have the most accurate results, try doing this at different times of the day so that you can take an average in case the signal strength received changes due to the masts "breathing".

Signal Strength	dBm value (range)	Expected User Experience
Excellent	Greater or equal to -65	Very strong signal, great voice quality and maximum data speeds
Very Good	Less than -65 and greater or equal to -75	Strong signal with good voice quality and very good data speeds
Good	Less than -75 and greater or equal to -85	Good signal with adequate voice quality and good data speeds
Average	Less than -85 and greater or equal to -95	Average signal, reliable data speeds maybe attained
Fair	Less than -95 and greater or equal to -105	Fair but useful signal attained
Poor	Less than -105 and greater or equal to -115	Performance drops with speeds getting increasingly slow
Weak	Less than -115	Marginal data, network disconnections may occur

\* Ofcom defines a sufficiently strong 4G signal as greater than or equal to -105 dBm (Fair and above in the table).

## Switch networks

If you have determined that the signal strength you are receiving is poor or weak, or you are looking for a new provider then use one of the postcode checkers to see what services are provided by all the operators. You may find that a different carrier has a better service in your area than another – especially in relation to the deployment of the new 5G service. But don't worry, you can easily take your existing mobile number with you if you switch and the whole switching process only takes a couple of days.

# Mobile Connectivity advice for consumers

## Still getting a poor signal?



Then you can try the following tips to try to improve your mobile coverage:

- **Open a window:** Just opening the nearest window in the direction of the nearest mobile phone mast can help boost your signal.
- **Get up high:** If you are outdoors, try looking for the highest ground nearby. If you are indoors, then get as high as possible within the building. The higher you are the better chance of improving your signal as mobile signals require line of sight for the very best signal.
- **Wi-Fi calling:** An increasing number of operators now offer voice over Wi-Fi services which makes it possible to access voice calls and SMS over a Wi-Fi network, for example your home broadband connection. You will need to have a compatible mobile device and enable the Wi-Fi calling functionality to use this service. Wi-Fi makes calling and sending SMSs highly convenient for use indoors in areas with patchy mobile coverage. Upgrading handsets to newer models with Wi-Fi calling functionality is therefore a quick way of improving the indoor mobile service user experience.
- **Upgrading your phone:** The design of new phones and size of their internal antennas often have a better reception than older devices. But not always, check reviews and look to see if any handsets have better or worse customer ratings for signal strength or performance of the aerial.

## Toggle between 2G / 3G and 4G

The network settings in most modern handsets are by default configured to be on "4G preferred" mode which makes it likely for the 4G layer to be congested in busy areas such as large venues and metropolitan centres. Toggling the network settings to "3G / 2G" mode when there is difficulty in accessing voice and data services on 4G may be a temporary fix as there might be additional capacity on the 3G / 2G layers, whilst they are still available that is.

## Enterprise Small Cells and In-building Solutions

If you're a business with staff or customers on site and mobile connectivity is poor you may wish to take additional measures to improve your in building coverage and support your staff and customers by providing them with information how they may connect – such as providing a 'Wi-Fi' network. Please note there are products available online that can boost / amplify / repeat a mobile signal from outside to indoors, however before purchasing please check first that these are approved and licensed for use in the UK.


Businesses in Worcestershire looking to improve in-building mobile coverage as a way of improving their services should look to contact their preferred MNO or Systems Integrator to discuss options available to them. Other options, including Femtocells, Picocells and Microcells are discussed in our final guide.

### How to Guides

This guide is one of number of guides Worcestershire County Council has created to help support residents, businesses, and visitors to get the most out of their broadband and mobile connectivity.

Other guides can be found on the Worcestershire County Council website:

[www.worcestershire.gov.uk/digitalconnectivity](http://www.worcestershire.gov.uk/digitalconnectivity)

 /broadbandworcs

 @ConnectingWorcs

The information provided by Worcestershire County Council through these Mobile and Broadband Connectivity Guides is for general informational and educational purposes only and is not a substitute for professional advice. Accordingly, if you are not familiar with the technology and before taking any actions based upon such information, we encourage you to consult with the appropriate professionals.

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