



Llywodraeth Cymru  
Welsh Government



# Code of Best Practice on Mobile Phone Network Development for Wales

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# Introduction

Affordable, secure digital infrastructure is essential to people and businesses. The availability and exchange of information afforded by telecommunications ensures people and businesses are connected to communities and the wider world and are essential for long term prosperity. Modern society demands reliable and fast communication networks to drive economic activity, to allow people to keep in touch and to access public services.

Mobile connectivity plays a central role in digitally connecting people and businesses connecting them to the internet, the cloud and to each other.

The Welsh Government programme for government, Taking Wales Forward, sets out four cross-cutting strategies:

- prosperous and secure;
- healthy and active;
- ambitious and learning, and
- united and connected.

Mobile connectivity directly supports the United and Connected theme through connecting people and communities but also supports the three others by enabling business connectivity, the delivery of public services and learning opportunities.

Better mobile connectivity also underpins many of the ambitions in the Future Generations and Well-Being Act enabling communities to connect, supporting participation, enabling education and skills, and providing access to key services.

Although telecommunications policy is not devolved to Wales, the Welsh Government recognises the importance of mobile connectivity and is working to create the right environment to encourage further investment in mobile infrastructure and to promote innovation in mobile technologies through the Mobile Action Plan for Wales.

The Mobile Action Plan for Wales recognises that the planning regime has a key part to play in maximising mobile phone coverage across the country. It sets out a number of actions to create a planning environment that is fit for Wales, reflecting its topography and population distribution, balancing the local economic and societal benefits of better mobile signal coverage and capacity with the need to safeguard sensitive landscape areas and protect residential amenity. The revision of the Code of Best Practice on Mobile Phone Network Development is one of those actions.

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## Background

The previous code of best practice dates from 2003. Whilst many of the principles outlined in that document are still relevant, it is evident that there have been changes in technology and societal expectations relating to telecommunications and the infrastructure required to support mobile phone networks.

Over 95% of households in the UK own at least one mobile phone. The ubiquity of mobile telecommunications means that it is an essential element of modern life and the Welsh Government is committed to supporting the roll out and upgrade of the mobile phone network.

The planning system is a devolved function of the Welsh Government, and it is a key

delivery and regulatory mechanism for mobile telecommunication apparatus. Full details of the Government's planning policies are contained in Planning Policy Wales and Future Wales: The National Plan 2040.

This document replaces the code of best practice published by the Welsh Government in 2003. It has been produced jointly between the Welsh Government, planning authorities and the mobile industry in the light of changes to the planning legislation and policy and is intended to facilitate the smooth roll-out and upgrading of mobile telecommunications apparatus in Wales.

The intent for this code of best practice is to:

- support the roll out of mobile phone infrastructure and to provide guidance with regards to the complex requirements associated with network deployment;
- set out an engagement framework for mobile network operators and planning authorities when considering applications for prior approval and/or full planning permission for the improvement of mobile networks;
- seek to avoid areas of conflict and to minimise any perceived adverse impacts with the provision of telecommunications equipment;
- and support a more collaborative approach to the deployment and improvement of digital connectivity throughout Wales.

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## Mobile Industry

In the UK the mobile network operators (MNOs) are EE, 3, Vodafone, and O2. They have established two joint venture infrastructure providers – Mobile Broadband Network Ltd (MBNL) – for EE and 3, and Cornerstone Telecommunications Infrastructure Ltd (Cornerstone) – for Vodafone and O2. These are responsible for deploying, maintaining and managing their respective MNO networks on a shared basis. Mobile UK is the trade body for the four MNOs.

There are also other infrastructure system providers (ISPs), such as Arqiva, Cellnex UK and the Wireless Infrastructure Group (WIG),

who own, control or manage portfolios of towers or other high structures, which can be made available to the MNOs and other operators.

MBNL and Cornerstone have site sharing agreements with the other main ISPs and where new sites are required, they may seek to place them with these other ISPs. This is consistent with the statutory and policy requirements to explore the use of existing structures before developing new sites. It is only when these avenues have been exhausted that a search may be made for a new site.

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## Technology

As technology has evolved, we have been able to do more and more with our mobile devices. Second generation (2G) technology gave us voice calls and text messages, and third generation (3G) gave us access to the internet and other data on the move. More recently, 4G brings superfast mobile broadband at speeds roughly equivalent to those you would expect from a fixed broadband connection. The advent of 5G networks will bring very high speed, high bandwidth and low latency connectivity not just for use with mobile handsets but also for a range of other internet of things (IoT) uses including

industrial and real time monitoring. Much of the guidance in this document relates to the deployment of 5G infrastructure.

Mobile phone technology uses differing parts of the radio spectrum to broadcast signals to and from infrastructure such as masts to mobile phone handsets. Different spectrum bands have different characteristics, which affect the extent of coverage and how much data can be carried.

# Shared Rural Network

There are large parts of rural Wales where there is little or no mobile connectivity. These are also often challenging areas to deploy mobile infrastructure because of topography and the economics of developing installations that might only serve small populations and low numbers of passing customers.

To address the digital divide that has emerged in these areas, the UK Government and the MNOs have agreed to develop a shared rural network (SRN) on a combined basis. To gain maximum coverage, it is likely that some of the SRN infrastructure will be tall, but that should reduce the overall number of sites that may otherwise be required in some sensitive landscapes.

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## Siting and Design

MNOs use sophisticated planning tools for operational and technical requirements and computer-based planning tools to predict levels of signal strength and coverage from sites for 2G, 3G, 4G and now 5G. As set out above each part of the spectrum has subtly different broadcast characteristics and as such it is a complex and difficult process to manage network coverage. Overlaying the latest technology may not perfectly replicate the existing technology and subsequently not spots and partial not spots may be created.

Once an MNO has identified a requirement for a new installation, a suitable and available site must be identified. Elements that make a site favourable include: having existing or ready access to a power supply, access to fibre optic cables, an existing vehicular access, and, other buildings and development which may provide a level of existing screening. Planning authorities should therefore consider these issues and balance the need for a site within a limited search area with the greater public benefit of improved connectivity. In general, it should not, therefore, be appropriate for planning authorities to seek wider evidence of alternative sites, unless they consider the solution is unacceptable having regard to all material planning considerations.

As part of this selection process, the MNOs should examine relevant development plan policies and designations for the area and undertake a physical site search to identify potential options which best meet these coverage requirements, whilst taking into account this planning guidance.

MNOs will typically look to upgrade existing infrastructure prior to considering a new deployment.

The initial deployment of 5G will seek a search area which, in many cases, will be much more defined around the existing network and localised to cover a specific coverage gap. In turn, this may limit siting options and design solutions. The initial rollout will replicate the existing networks and will therefore predominantly require the upgrading of existing mast sites in the first instance.

## Special Technical and Operational Considerations

All telecoms installations are principally guided by the technical need for the site and the technical constraints placed upon broadcasting a signal.

The siting and design of such installations must therefore be balanced between perceptions of visual impact and the proposed installations' technical needs and constraints.

The main technical and operational criteria are set out below:

- The need to provide an acceptable level of coverage both outdoor and indoor, over the intended geographical area. This will normally be supported by an elevated structure e.g. a mast, building or other high structure, to ensure that antennas are suitably elevated to clear any 'clutter' (buildings or trees etc.) that can obstruct signal propagation.
- The need for backhaul, a connection to the wider network, is critical. Backhaul is ideally provided via fixed fibre optic cable links or if unavailable, via dish links. If a dish link is proposed, then a clear line of sight to the corresponding connection is required. This may well dictate the overall height of the installation rather than the broadcast requirements of the antennas. On occasion, where mountains and valleys are in the way, it may be necessary to 'bounce' the signal via more than one base station.

## Greater Apparatus Requirements

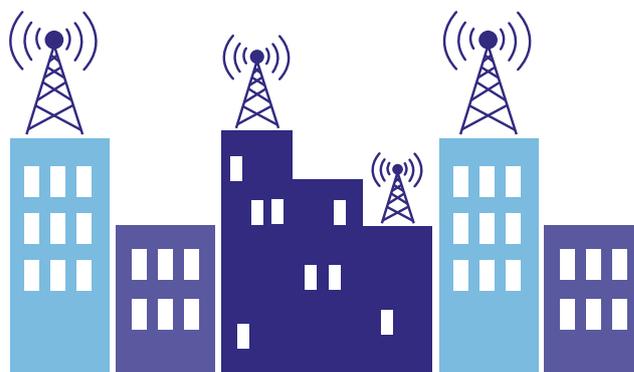
The introduction of 5G will create a need for more apparatus. 5G will operate across multiple radio spectrums and the antenna systems will continue to provide 2G, 3G and 4G services that demand lower speeds. Consequently, there will be a requirement for greater numbers of antennas than before, as well as new radio equipment cabinets and taller structures. Furthermore, they will often be larger and so greater in appearance.

In addition to the antennas, there will also be a requirement for a greater range of ancillary apparatus to combine the different radio frequencies and help regulate signal and power loss between the radio equipment and the antennas themselves.

This ancillary apparatus will be mainly small units normally behind or very close to the antennas. In some cases, they may be grouped on purpose-built support apparatus, and may need higher and larger structures to support them.

This larger, more numerous and heavier apparatus, with additional wind loading, will need extra supporting steelwork on rooftop installations or sturdier masts with larger headframes. In many cases this may lead to the redevelopment of existing structures.

## Network Density and Location



4G and 5G are data driven technologies where high volumes of data are transferred between the base station and mobile phone handsets or other device. Each base station can only handle a particular amount of data traffic before it becomes saturated and the service fails.

This means that in densely populated and urban areas, where you have a high demand on the network, a greater number of base stations are required to meet the data traffic demand. With the continuous increase in demand for data services, as people use their smart phones for streaming and other data hungry applications, there will be greater demand for even more base stations, sited where the demand is.

Previous mobile generations used sector or omni-directional antennas sited at height to provide geographical coverage over the area. In urban areas, due to the nature of the radio spectrum (see below) 5G will not travel as far, which means the network will have to be denser. To ensure efficiency the antennas will be more "intelligent" and highly 'directional'.

As a consequence, the spacing of installations will reduce, especially in the urban areas. This will increase with the take up of uses and reliance on services dependent on ultra-fast 5G connectivity, such as real time health and financial applications and the introduction of connected autonomous vehicles, which will require ubiquitous coverage.

In addition 4G and 5G use increasingly higher frequencies than previous generations. This is required because higher frequencies can transmit much higher volumes of data. However, the simple physics of radio waves means that the higher the frequency the lower the propagation in terms of distance.

Higher frequencies also do not propagate through materials as well as lower frequency signals. Given 5G services must propagate through buildings and other materials, which significantly reduce their functionality, it is vital base stations are sufficiently close in proximity to where people want to use the technology.

In practice, this means that the MNO may need to put a base station within a commercial or industrial area and directly within the surrounding residential areas.



## Network Capacity and Resilience

The speeds, uses and applications anticipated for 5G mean network capacity and resilience will be critical factors. As a result, unlike previous generations, 5G will rely more on dense fixed line fibre optic cable backhaul networks as these are both reliable and have very high capacity. The availability of fibre routes and the opportunity to extend them will significantly influence the siting and design of new installations.

Where fibre is not available or to provide alternative secondary routing for resilience, it may be necessary for installations to include dish antennas (transmission dishes), which operate on a direct 'line of sight' basis to other dishes on corresponding installations on the network. This is not new, but to avoid latency, which would adversely affect real time applications and because of the volumes of data, sites will have to link directly into other sites that have a fibre connection. Connecting through a number of sites will not therefore be feasible with 5G and this may mean that outlying sites will have to be sufficiently high to afford the necessary line of sight to a more distant installation. More information is provided in Annex A – Siting and Design.

## Avoidance of Clipping

On rooftops, 5G antennas will need to be much closer to the building edge to avoid shadowing and antenna 'clipping' from the edge of the buildings and to allow the smart "tracking" features of the antennas.

If this is not possible, then the antennas may have to be located higher on structures in the centre of the roof but raised to a height to avoid the same 'clipping' issues. For antennas on ground-based masts, they will also have to be sufficiently high and clear of obstacles that can degrade signal propagation and be sited close to the target area.

## ICNIRP Compliance

All mobile phone apparatus must comply with the requirements of the radio frequency (RF) public exposure guidelines of the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

Some 5G apparatus will operate at higher power levels than earlier generations and so antennas will need to be elevated higher off building rooftops, to ensure that public exclusion zones can be maintained.

Rooftop installations, whether new or existing, will all be subject to this constraint and such installations maybe perceived as more visually dominant.

## Network Deployment Considerations

The siting of 5G installations will be more constrained and guided by special technical and operational considerations as mentioned above than previous generations. The sharing or redevelopment of existing installations accords in principle with the statutory and policy requirements to use existing structures. In addition to avoid the unnecessary proliferation of mobile infrastructure sites this will generally provide the best network solution with minimal disruption to existing network services.

Where appropriate planning authorities and mobile operators should work together to find suitable design solutions to minimise the visual impact of new apparatus required for 5G at existing sites. For redevelopments of existing masts or roof top installations there may be scope for agreeing detailed amendments to siting and other mitigation measures.

Where new sites are required, operators should follow the normal sequence of site search and selection as follows:

- explore first the possibility of sharing any existing building or other structure;
- if no such structure exists, explore opportunities to locate sites within or close to other utilities or commercial development;
- if no such scope exists, explore opportunities for sites that are well screened by other development or natural features, such as trees, vegetation and undulating topography;
- residential areas will require service provision and infrastructure may be required in close proximity to housing. However, prior to proposing a new site in a residential area,

alternative solutions should be explored initially to ensure the proposal of least impact is progressed, while considering technical constraints;

- heritage sites and assets may require service provision, and where this is the case infrastructure will be needed within or in close proximity to them. However, prior to proposing a new site in a heritage area, alternative solutions should be explored initially to ensure the proposal of least impact is progressed, while considering technical constraints.

The scale of equipment is likely to mean that previous camouflage design solutions, such as tree masts, mock chimneys and flagpoles, are unlikely to be practicable for 5G. Where new sites are required this means that previous siting and design solutions, such as antennas installed behind louvres in church towers or mock flagpoles on heritage buildings are unlikely to be suitable for 5G.

This places emphasis on simple, unfussy designs, with attention given to finishes and colouration that might help minimise appearance.

In assessing proposals, planning authorities should have due regard to the special technical and operational considerations, and not seek to place or make unrealistic design demands. Planning authorities should give consideration to the balance between improved digital connectivity and the perceived visual impact of the development.

### More information

Further more detailed information about site selection and design can be found in Annex A.

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## Consultation and Application

When proposing telecommunications development, it is important for operators to engage positively with the local authority. Pre-application discussions are important in helping to identify the most appropriate

solution for any individual development. The circumstances of each case and the level of consultation needed will usually differ depending on the location and type of development.

Throughout the consultation stage the operator may provide the following to the planning authority:

- an explanation of their needs in a particular area;
- details of the location and type of telecommunications apparatus or structure intended to be constructed;
- details of any other mobile phone systems on the building or site;
- the area of search and details of possible alternative options, where requested by the planning authority, which may include other methods of providing the required coverage and;
- design options for particular sites.

The consultation period is to be a minimum of 14 days from receipt of the communication to allow an opportunity for the consultee to respond prior to submitting an application for planning permission or prior approval.

The planning authority may then comment on the appropriateness of the siting and design of the proposals. This exchange of information can take place in written form in the most straightforward of cases. However, it may be in the interests of all concerned for a meeting to take place to discuss the proposal. Such a meeting may provide the planning authority the opportunity to better understand the rollout and the potential number of applications proposed. The aim is to ensure that time is not wasted in abortive applications that may be unsuitable, and to guide the planning authority as to how and when further improvements to digital connectivity can be deployed.

## Pre-application Consultation with Local Residents

There are a number of additional consultation tasks that could be undertaken by the operator depending on the characteristics of a site. The operator should consider on a case by case basis whether additional consultation methods should be employed. Elected members who are consulted by an operator about a proposal should be guided by the model code of conduct and any statutory code which has been formally adopted by their authority.

## Consultation with Schools and Further Education (FE) Colleges

Where it is proposed to install, alter or replace a mobile phone base station on or near a school or college, operators should discuss the proposed development with the relevant body of the school or college of further education concerned before submitting an application for planning permission or prior approval to the planning authority. Operators should discuss and agree with planning authorities in advance which particular schools and colleges should be consulted, and this should form part of the consultation plan shared with the planning authority.

There are no hard and fast rules for determining whether a base station is near a school or college for the purposes of pre-application consultation. The institutions concerned need to be considered on a case-by-case basis in the light of local circumstances. In determining whether a school or college should be consulted, the following factors should be taken into account by operators and planning authorities:

- the proposed site is on school or college grounds;
- the site is on a main access point used by pupils or students to the school or college;
- the planning authority has requested consultation with the school or college and;
- the school or college has requested that it be included in any consultation.

For consultation purposes the following actions should take place as a minimum:

- A standard consultation letter or electronic communication should be issued to the school or college. This should be via recorded delivery if a letter and if electronic then saved and referenced within any subsequent application. Consultation with a school or further education college needs to be with the head teacher (or principal in the case of further education colleges) and with the chair of school governors or equivalent body for further education colleges.

## Site File Records

To ensure complete record keeping of the consultation process, a copy of the completed consultation assessment and any consultations with the school or college should be retained on the operator's site files. This will ensure accurate records that can be referred back to in discussions with the local authority in respect of any subsequent planning submission. Copies of the consultations undertaken should be included with any subsequent application if required by the planning authority.

## Consultation with Other Interested Parties

MNOs should consider on a case by case basis whether pre-application consultation would be useful with other interested groups, such as local amenity groups, National Park societies etc.

## Submission of Application

Telecommunications development will normally fall into one of three categories:

- permitted development;
- permitted development that requires prior approval or;
- development that requires an application for planning permission and/or listed building consent.

As the information required by a planning authority is broadly the same for applications for prior approval and for planning permission, these are treated the same for the purposes of best practice.

## Permitted Development

Not all permitted development requires prior approval. This can range from the installation of additional antennas on an existing radio mast to the development of a whole base station on a building, including equipment.

In addition, there is a requirement for the operator to provide the planning authority 28 days written notice before installing any telecommunications apparatus that does not require prior approval or planning permission. This process has sometimes been known as the licence notification, a code notification, or a regulation 5 notification. The planning authority may make representations and the operator may consider them if practicable.

The quality of information submitted as part of an application for telecommunications development is very important. It should always be clear and complete. Good quality submissions can help explain to local people and consultees, as well as council officers and elected members, exactly what is being proposed and its likely impact. By adopting high standards, applicants can avoid spending unnecessary time and effort in trying to explain proposals, and can help allay concerns that can be caused by ambiguous and incomplete information. In addition, good quality submissions are likely to result in speedier and better informed decisions.

By adhering to the guidance set out below, operators will be able to achieve the quality of submissions that this code is seeking to deliver.

## Drawings

The details of the drawings to be submitted are set out in the relevant validation circular.

## Maps

A map should be supplied on request from the planning authority to indicate discounted options.

## Notifications

For applications for prior approval evidence should be included that the developer's notice (see paragraph A.4 of Part 24) was served before the application was submitted should be provided.

For applications for planning permission evidence should be provided that the owner, and any agricultural tenant of the land to which the application relates, has been notified of the proposed development.

Supplementary information to be provided can be found in Annex C.

## Declaration of Conformity with ICNIRP Public Exposure Guidelines

In Wales it is a statutory requirement that applications for planning permission or prior approval should be accompanied by a written declaration that the development, if it involves the construction of one or more antennas, has been designed to operate in full compliance with the requirements of the radio frequency (RF) public exposure guidelines of the International Commission on Non-Ionizing Radiation Protection (ICNIRP). This applies both to:

- applications for prior approval (see TCP (General Permitted Development) Order 1995, Sch 2, Part 24, para A.3(4)(c), as amended; and,
- applications for planning permission, where required (see TCP (Development Management Procedure) (Wales) Order 2012, art 9(3)).

The ICNIRP public exposure guidelines have been taken as the numerical basis for the EU Council recommendation of 12 July 1999 (Reference 1999/519/EC) "on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)".

Compliance with the ICNIRP public exposure guidelines is normally determined by mathematical calculation, and implemented by careful location of antennas, access restrictions and/or barriers and signage as necessary. Operators should ensure that members of the public cannot unknowingly enter areas close to the antennas where exposure may exceed the guidelines.

The calculation of the RF field produced by an antenna should be based on recognised, standard methods. Examples of the calculation methods that can be used are defined in CENELEC EN 50383 "Basic Standard for the calculation and measurement of electromagnetic field strength and SAR related to human exposure from radio transmitters".

The emissions from all mobile phone network operators' equipment on the site is taken into account when determining compliance.

## General

Any plans should be provided on separate sheets and be no smaller than A4 size.

Applications should be submitted via the planning portal and the determination period starts once the application has been transferred to the planning authority, that being day one of the determination period. Confirmation of the submission of the application having been received from the planning portal can be considered to provide such evidence of the submission and the start of the determination period.

In certain circumstances a photomontage may be helpful for example adjacent to a heritage site or protected landscape. This should consist of a before and after photomontage of the radio base station, fencing, landscaping and access (where applicable). The need for a photomontage should be made clear to the developer as early as possible in the process.

## Determination of Application and Timescales

Under the prior approval regime a local authority has 56 days, beginning with the date on which it receives a valid application, in which to make and notify its determination as to whether prior approval is required for siting and appearance and to notify the applicant of the decision to give or refuse such approval. If no decision is made, or the planning authority fails to notify the developer of its decision to refuse the application within the 56 days, permission is deemed to have been granted.

The introduction and observance of this code by operators and authorities alike should assist in processing prior approval applications within the time period allowed.

In responding to applications for a prior approval determination, authorities may wish to take into account the advice offered in the following paragraphs.

An application to the planning authority for prior approval will normally be made via the planning portal. To be valid, as required by para A.3(4) of Part 24, the application must be accompanied by:

- a description of the proposed development, a location plan, and the relevant fee; and
- the developers contact details (including email address).

In appropriate cases, the application must also be accompanied by:

- evidence that a developer's notice has been served on all owners and tenants of the site;
- a declaration as to compliance with the ICNIRP guidelines; and
- where the site is within 3 km of an aerodrome, evidence that the CAA or the aerodrome operator has been notified.

Confirmation should be sent to the developer of the date on which the application has been received by the authority, and the authority is satisfied that it is valid. The date a valid application, as defined in Part 24 of the GPDO, is **received** is day 1 of the 56-day period. It is advisable that the expiry of that period is communicated promptly to all relevant planning authority staff. The development may then only start once one of the following has occurred (see para A.3(7)):

- the planning authority has stated in writing that prior approval is not required;
- the authority has stated in writing that prior approval is required, and has given such approval in writing before the end of the 56-day period;

- the authority has stated in writing that prior approval is required, and the 56-day period has expired without the authority having notified the applicant in writing that approval is given or refused; or
- the 56-day period has expired without the authority having notified the applicant in writing whether prior approval is required.

It is not sufficient for a planning authority simply to have made a decision that prior approval is or is not required, or that such approval is given or refused. Such a decision must actually be communicated to the applicant in a formal written notice, which must be received by the applicant before the end of the last day of the 56-day period. The authority therefore needs to devise and use reliable and verifiable means to bring such a notice to the attention of the applicant.

## Delegation

The 56 day period may make it difficult for planning authorities to use the committee system in determining prior approval applications and therefore effective arrangements to delegate decision making to officers may be needed.

The term "delegation" here means a chief officer or other senior officer taking executive action on behalf of the council to determine:

- whether or not prior approval is required;
- if prior approval is required whether to approve or refuse approval consent and;
- planning applications for telecommunications development.

Delegation is a discretionary power. It is not a process that will change the outcome of an application or a transfer of power from elected members to officers.

From time to time proposals for telecommunications development (prior approval or planning applications) are controversial and sensitive. The planning authority should consider whether in such circumstances elected members should make the decision (within the time allowed). Members can add particular value to the process through balancing the conflicting pressures of difficult proposals.

## Publicity

Additional publicity for prior approval applications should be considered in order that people likely to be affected by the proposed development can make their views known to the authority.

Where planning authorities consider additional publicity with respect to prior approval applications may be helpful, they should give due consideration to:

- the relevance and amount of information to be made available;
- the timeliness for providing and evaluating this information;
- access to this information and;
- any special needs of the local community.

## Specialist Advice

Certain aspects of telecommunications development (whether in relation to prior approval or planning applications) are complex and the expertise required to verify whether or not certain technical constraints or arguments are valid is unlikely to be held within a planning authority. In these circumstances (which are likely to be rare) a planning authority should seek outside help.

A decision on whether or not an “expert opinion” is required should be made as early as possible. Before going ahead with employing specialist advice, a planning authority should be clear about the exact nature of the problem it is dealing with so that the scope of the advice received is sufficiently focussed to be of benefit.

## Training

Given the continuing scale and pace of change in the telecommunications industry, it is important that all who are involved in the planning aspects, including agents and consultants, keep up to date with legislation and the latest guidance and technological advances so that at all times the public receive the highest quality of advice.

It is recognised good practice that councils should ensure that their members receive training on the planning process when first serving on the planning committee as well as being updated regularly on changes to legislation or procedures. This is particularly relevant in the case of telecommunications development.

Planning authority officers may benefit from training as part of a Continuous Professional Development (CPD) requirement and also as part of a personal development plan arising out of a staff appraisal scheme and the commitment that many authorities have made to Investors in People (IiP).

Consideration should be given to establishing professional development workshops on technological developments within telecommunications for planning authority officers and elected members. A number of successful workshops have already been held across the country. This is an ongoing programme. Planning authority officers and members are encouraged to take up the opportunity that these workshops offer or make alternative arrangements.

The wide use of this code should serve to raise the threshold of understanding of telecommunications development in planning authorities generally.

There may be merit, where resources allow, in having a particular officer designated to deal with telecommunications matters. This officer can keep abreast of developments and advise staff dealing with individual applications on the relevant legislation and on technical and other related areas. However, authorities should bear in mind that this approach could cause difficulties if, for example, the officer in question was on leave or moved to another authority.

# Annex A – Site Selection and Design

## Site Selection

### Use of Existing Buildings or Structures

1. As part of the site selection process operators should try to utilise existing buildings and structures to host their equipment, where possible. However, there are limitations: the owner of the building must sign a code agreement, and be willing to sign a lease to accommodate the equipment; certain buildings or structures may also not be sited appropriately, or of sufficient height or structurally capable of hosting additional equipment; or it may be difficult to get power to some structures. These constraints should be given consideration when assessing site selection.

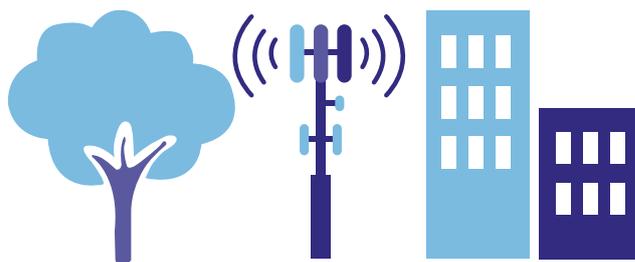
### Protected Areas and Heritage Assets

2. Many rural areas across Wales are covered by AONB and National Park designations. They depend upon tourism and agri-industry for their overall sustainability. Modern mobile connectivity can facilitate home working and support inward investment for businesses, which create jobs for local people and minimise 'urban migration', underpin social benefits and provide access to emergency services.

3. Planning authorities should understand the relevant benefits and constraints around deployment when considering proposals or taking part in pre-application discussions for proposals in protected areas.

### Minimising Visual Impact

4. Where viable, sites should be deployed to make use of screening or backdrop. This could be in the form of buildings or vegetation but antennas must clear any surrounding 'clutter' that obstructs the signal and the service. Therefore, while siting should make use of screening, it is vital that the antennas are of a sufficient height.

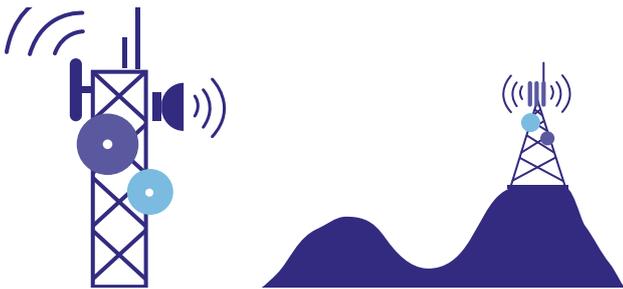


5. Siting in residential areas should attempt to put infrastructure at an angle or reasonable distance from the main elevations of dwellings to minimise direct overlooking, which may adversely affect residential amenity.

6. Street furniture poles should attempt to site in line, and in rhythm, with existing vertical infrastructure like streetlighting columns so they assimilate better, it also makes them appear more congruous and minimises impact. It must be noted that telecommunications poles will be significantly taller than streetlighting columns and other street furniture. A streetlighting column cannot provide 4G or 5G mobile broadband service over a relatively wide distance and so, while both are acceptable in the street scene, they should not be considered under the same principles.

## Backhaul

7. Ideally, backhaul is provided via fibre optic cables directly to the base station. However, in some cases where fibre backhaul is not possible, there must be the deployment of a microwave dish link transmission. A dish will be attached to the mobile base station to transmit the data to a secondary base station with a fibre connection. Where mountains and valleys are in the way it may be necessary to 'bounce' these beams through more than one mobile base station.



8. Mobile base stations with fibre backhaul provided will also have dishes attached – this is because these dishes are needed to connect a remote site where there is no fibre backhaul into the network.

9. Given this dish to dish communication must have perfect line of sight over large distances, this can be a significant constraint on mobile base station siting. Sites will be identified based on their ability to 'see' other mobile base stations in the wider locale via perfect line of sight. Sites must be of a sufficient height to ensure all barriers are cleared to deliver perfect line of sight.

10. Where you have a 'hub-site' that is providing backhaul for numerous other remote sites, if that site is disrupted it can then disrupt all the remote sites it is servicing creating a large-scale service provision implication.



11. If a rural site cannot obtain backhaul via microwave dish link or fibre then it will not be able to provide service to a rural community so this is a significant constraint planning authorities should consider when assessing a mobile base station siting proposal.

## Power Accessibility Constraints in Rural Areas

12. Without power a mobile base station cannot function and therefore siting is often dictated by power source. In urban areas there is typically an abundance of power sources, however, in rural areas it can be extremely difficult to route power to a site.

13. Often it is not commercially feasible to install a new power source to a remote site and there can be numerous wayleaves necessary with third party landowners to deliver the power.

14. Planning authorities are encouraged to give due consideration to these constraints around the power source, including the commercial aspect of excessive costs of power delivery to a remote mobile site which serves a relatively low population.

## Topography

15. Topography can be a significant constraint to radio propagation. A mobile base station cannot provide service around valley walls or through hills it must be able to transmit over them for service provision. The taller a base station or the higher it is sited on a valley wall, the more it will be able to cover.



16. Planning authorities should be aware of the constraints topography poses when considering siting proposals for mobile base stations and take this in to account when assessing proposals.

## Siting on Adopted Highway

17. Operators must give due consideration to ensure that new, upgraded or replacement sites do not adversely impact upon highway safety in terms of visibility splays or footpath width for unrestricted pedestrian and disabled access. 'Manual for Streets 2' provides guidance on this element.

18. Highways and trunk road authorities should be reasonable in assessing potential highway safety issues with a presumption in favour of facilitating network development.

## Site Accessibility for Build and Maintenance

19. Siting is often dictated by access for build and maintenance. Many mobile base stations are large pieces of infrastructure and require large cranes to put them into place. If a crane cannot access a location, then the site cannot be built. Similarly, antennas often need maintenance work, sometimes requiring access for specialist equipment such as cherry pickers. A lack of such access to a site when necessary means the site is not maintainable.

20. Often surrounding land is owned by third parties who may not permit access for build or maintenance. These constraints dictate siting options and can prohibit deployment if they cannot be addressed. As such planning authorities should give due consideration of these constraints.

## Planning Authorities should work pro-actively with MNOs

21. Consultation with the MNOs regarding their rollout and upgrade plans will provide planning authorities with visibility of the scope and extent of network deployment.

22. The introduction of improved connectivity will benefit the whole of the community and is a public benefit socially, economically and commercially. As such planning authorities should encourage improvements in digital connectivity and seek to assist MNOs in finding suitable locations for new equipment.

23. Where proposals are made within sensitive land use designations such as National Parks or conservation areas planning authorities should appreciate the difficulties regarding deployment and seek to find solutions collaboratively.

## Design

### Minimising Visual Impact

24. Where possible, masts should be coloured to match their backdrop to minimise contrast in an urban or rural setting.

25. However, it must be noted that painting of 5G antennas is not possible as it impacts on propagation and operating efficiency. This creates the potential for a pole or mast being a particular colour but the antenna remaining grey.

26. Cabinets and equipment housing should be coloured appropriately to match surrounding street furniture or assimilate with the setting.

27. Sites will be designed based upon structural requirement, radio functionality and to minimise visual impact. Poles may be used in settings where there are numerous floodlights or lattice towers may be used given they can present a more transparent appearance and allow light to pass through.

### Site Sharing Principles

28. In principle, site sharing is positive in terms of minimising the number of sites required and reducing proliferation.

29. However, sharing means that a mast must support all the equipment for all technologies (2G-5G) for up to four MNOs. This is a significant amount of equipment both on the mast and in terms of equipment housing at the base.

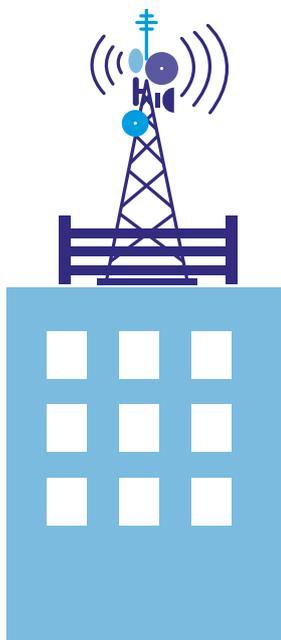
30. Structures must be significantly more robust to allow sharing and this will often dictate that a larger and wider lattice type design is required. This is more achievable and desirable in rural areas, but in urban settings it may not be appropriate and less desirable (given the scale of infrastructure necessary) to share so extensively.

31. The four MNOS have commercial agreements amongst themselves to share infrastructure which maintains competition, facilitates sharing, reduces proliferation and negates additional infrastructure of the scale required to host four operators, thus opening up more design options and minimising environmental impact.

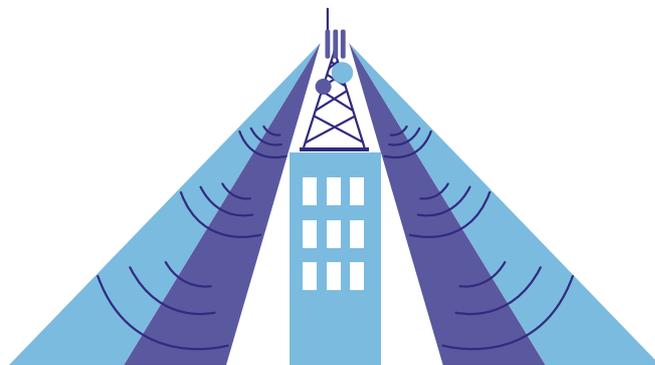
### Constraints of Rooftop Design

32. There is no standardised rooftop design – it all depends upon structural integrity, accessibility, surrounding buildings, aesthetics and building-owner requirements. Antenna height on rooftops will be dictated by the height of surrounding buildings and the structural capabilities of the roof, while minimising visual impact.

33. If a rooftop can be accessed by the public then the design may be influenced by ICNIRP requirements. This may dictate face mounting antennas or the use of a central stub mast of sufficient height to ensure the rooftop remains within operating standards. In some cases, demarked exclusion zones may be required to maintain ICNIRP safety on a rooftop.



34. Given 'clipping' issues the antennas may need to be raised higher to negate this. Alternatively, antennas could be placed upon the edges of the rooftop to ensure they cannot clip the sides of the building. Which option minimises visual impact the greatest should be assessed on a site-specific basis given the complexity of rooftop deployment.



35. Planning authorities should be aware of the numerous constraints associated with rooftop deployment, especially with consideration that use of an existing building is likely to negate the need to deploy a whole new ground based installation, which is likely to have a greater environmental impact.

### Equipment Housing Principles

36. More equipment housing cabinets are needed at every base station, including street furniture to support the existing 2G, 3G and 4G services but also new 5G services. In time it is likely that equipment will be further miniaturised but at present the designs work within existing parameters.

37. Equipment housing must also be of sufficient size to facilitate hosting numerous operating equipment while also allowing air circulation to reduce the potential for overheating.

38. Planning authorities should be understanding of this need when considering proposals.

# Annex B – Glossary

AONB	Area of Outstanding Natural Beauty
Backhaul	Backhaul refers to the transmission of a signal via a high capacity line from a remote site or network to another site, usually a central one
CAA	Civil Aviation Authority
CAV	Connected Autonomous Vehicle
CENELEC	European Committee for Electrotechnical Standardisation
Cornerstone	Cornerstone Telecommunications Infrastructure Ltd
CPD	Continuous Professional Development
EC	European Union Council
EU	European Union
FE	Further Education
GHz	Gigahertz
GPDO	The Town and Country Planning (General Permitted Development) Order
Hz	Hertz
ICNIRP	International Council for Non-Ionising Radiation Protection
ISP	Infrastructure Service Provider
Latency	The delay before a transfer of data begins following an instruction for its transfer
Macro site	A macrosite is a cell in a mobile phone network that provides radio coverage served by a high power cell site (tower, antenna or mast).
MBNL	Mobile Broadband Network Ltd
MNO	Mobile Network Operator
Public Exclusion Zones	Areas where the general population are excluded from.
RF	Radio Frequency
SAR	Specific Absorption Rate
SRN	Shared Rural Network
WIG	Wireless Infrastructure Group
xG (i.e. 4G)	Generation of mobile network

# Annex C – Templates

## Supplementary Information Form

### 1. Site details

Site Name		Site Address	
NGR			
Site Ref Number		Site Type <sup>1</sup>	

### 2. The Proposal

Brief summary of the proposal

### 3. Pre Application Check list

#### Site selection

Was the industry site database checked for suitable sites by the operator?	Yes	No
If no explain why:		

#### Annual area wide information to planning authority

Can the annual area wide information be provided on request?	Yes	No
If no explain why:		

<sup>1</sup> Macro or Micro

### Pre-application consultation with planning authority

Date of written offer of pre-application consultation		
Was there pre-application contact?	Yes	No
Date of pre-application contact		
Name of contact		
Summary of outcome/Main issues raised:		

### Stakeholder Consultation

Outline consultation carried out:
Summary of outcome and main issues raised:

### Schools and Colleges

Location of site in relation to school or college (include name of school or college):
Outline of consultation carried out with school or college (include evidence of consultation):
Summary of outcome and main issues raised:

**Civil Aviation Authority/Secretary of State for the Defence/Aerodrome Operator consultation (only required for an application for prior approval)**

Will the structure be within 3km of an aerodrome or airfield?	Yes	No
Has the Civil Aviation Authority/Secretary of State for Defence/Aerodrome Operator been notified	Yes	No
Details of response:		

**Developer’s Notice (only required for an application for prior approval)**

Copy of Developer’s Notice enclosed	Yes	No
Date served		

**4. Proposed Development**

Type of Structure (e.g. tower, mast, etc):	
Description:	
<b>Overall Height:</b>	
Height of existing building (where applicable)	metres
<b>Equipment Housing:</b>	
Length:	metres
Width:	metres
Height:	metres
Materials (as applicable)	
Tower/mast etc. – type of material and external colour:	
Equipment housing – type of material and external colour:	

## Application Background

If there is any planning history to the current proposal? Have other operators gained consent (via application or appeal) for sites nearby?

## Design Statement

How the proposal complies with planning policy and guidance – How the proposal meets the siting and appearance factors listed in PPW and Code of Best Practice on Mobile Phone Network Development. How the design minimises impact, subject to technical and operational constraints. Reasons for the type of design: what alternative design solutions were considered and discounted, how the design fits in to the site and surroundings and minimises visual impact. Describe any landscaping schemes or justify why it was not required.

## Reason(s) why site required e.g. coverage, upgrade, capacity

## Reason site chosen:

Outline the main reasons the site was chosen

## Planning Policy Framework/Development Plan Policy

Assessment of site/proposal in relation to Government guidance and planning policy

Alternative sites considered and not chosen (not generally required for upgrades/alterations to existing sites including redevelopment of an existing site to facilitate an upgrade or sharing with another operator).

Site Type <sup>2</sup>	Site Name and Address	National Grid Reference	Reason for not choosing

If no alternative site options have been investigated, please explain why:

<sup>2</sup> Site Type: Mast and Site Sharing, Installation on Existing Buildings and Structures, Camouflaging and disguising equipment, Using small scale equipment, and Erecting a new Ground Based Mast.

**Public Access Statement**

**Construction and Maintenance Access**

Access to the site for construction and maintenance is indicated on the drawings. Insert any access information e.g. crane/cherry picker locations, any particular access considerations such as lay-bys, highway access points, climbing ladders, controlled/locked roof top access provisions etc.

**Health and Safety – including ICNIRP compliance**

**Additional relevant information**

**5. Contact Details**

Name (agent): \_\_\_\_\_

Operators: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax No: \_\_\_\_\_

Email address: \_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Position: \_\_\_\_\_ Company: \_\_\_\_\_

For and on behalf of MNO Name: \_\_\_\_\_