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Planning and Environmental Policy Group

Development Control
Advice Note 14
(DCAN 14)

Siting and Design of Radio Telecommunications Equipment

April 2008

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Development Control Advice Notes (DCANs) represent non-statutory planning guidance which is intended to supplement, elucidate and exemplify policy documents, including Planning Policy Statements (PPSs) and development plans.

The purpose of this DCAN is to provide advice on the process of site selection and design and illustrates how radio telecommunication equipment can be sensitively installed. It also explains why additional base stations are needed to serve the growth in customer demand and in response to changing technical requirements, including the third generation of mobile phones.

This Advice Note is not a statement of policy as to where telecommunications equipment can or cannot be installed. In making its decisions the Department will assess proposals against all planning policies and other material considerations that are relevant to it. The contents of this guidance will be material to decisions on individual planning applications and appeals. However, any legal views expressed in this note have no statutory force and should not be relied upon as an authoritative interpretation of the law.

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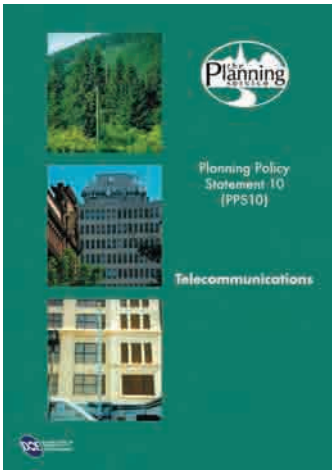
1.0 Introduction

1.1 Modern telecommunications systems have a vital role to play in our everyday life in Northern Ireland and bring important economic and social benefits. In particular advanced telecommunications can help reduce our peripheral location in Europe and allow access to new markets. It has been the policy of successive Governments to extend the social and economic benefits of modern telecommunications technology throughout the UK. Further development of our telecommunications infrastructure is therefore essential to the continued success of this policy, particularly to support widespread and affordable access to broadband services. However, it is also essential that this infrastructure is delivered sensitively, keeping impact on the environment to a minimum.

1.2 The Department's planning policy for telecommunications is set out in a Planning Policy Statement, PPS 10: Telecommunications. The main planning considerations that the Department will take into account in assessing proposals are set out in Policy TEL 1 of the PPS (see Annex A). The overall aim of the PPS is to ensure that new telecommunications infrastructure can be developed in a way, which continues to provide Northern Ireland with world class telecommunications services, while at the same time keeping environmental impact to a minimum. It advises that the telecommunications industry must devote greater attention to the siting and design of equipment. In addition the PPS addresses health issues associated with telecommunications development.

1.3 This Development Control Advice Note (DCAN) complements PPS10 by providing guidance about how the industry can continue to expand its operations in a manner that minimises the visual and environmental impact of equipment and highlights examples of good practice from Northern Ireland and beyond.

1.4 The DCAN gives advice on the process of site selection and design and illustrates how equipment can be sensitively installed. It also explains why additional base stations are needed to serve the growth in customer demand and in response to changing technical requirements, including the third generation of mobile phones.



PPS 10: Telecommunications

1.5 The DCAN is relevant to the full range of radio telecommunications equipment. This includes mobile, Fixed Radio Access (FRA), microwave link, television and radio broadcasting, paging, police, fire, ambulance, taxi and private telecommunication systems. Continued expansion of these systems is expected for the foreseeable future.

1.6 This DCAN has been subject to an equality impact screening exercise in line with the statutory obligation contained in Section 75 of the Northern Ireland Act 1998. The outcome of this exercise indicates that the DCAN is unlikely to have any significant adverse implications for equality of opportunity or community relations.

2.0 Telecommunications Systems

2.1 This section provides an overview of the main telecommunication services currently in use or being developed, including descriptions of the most commonly used equipment. Each system has different equipment and siting requirements and there are continual technical innovations. To keep up to date it will therefore be important for the Department to maintain a constructive dialogue with the operators on such changes.

Mobile Radio Telecommunications Systems

2.2 The UK is one of the world leaders in mobile telecommunications, with different network operators offering innovative and competitive services. The industry is continuing to grow as existing services are expanded, new services provided and consumer demands increase. Growth is likely to be driven by a range of factors including the increased capacity of digital broadband technology (including third generation 3G, fixed wireless and satellite systems), the growth in demand for communications of all kinds, especially mobile, non-voice or data services, more diverse services, continued growth of the internet, and greater competition. Change will also be driven by convergence, the integration of telecommunications, broadcasting and information technology sectors, and between fixed and mobile networks.

2.3 Mobile telecommunication systems work by using and re-using the same radio frequencies and allocating them to geographical cells. Mobile operators divide the country into hundreds of individual cells and at the centre of each is a base station. Base stations are connected to one another by central switching centres, which track calls and transfer them as the caller moves from one cell to the next. The area covered by each cell is governed by the anticipated capacity (i.e. volume of calls), the height of the antenna above the ground, the local terrain, the power output and the radio frequency - in general the higher the frequency, the shorter the distance the signal travels. The largest cells are in sparsely populated rural areas and the smallest in town and city centres. Splitting a cell into smaller cells can increase capacity. There is a great variety in the way cells are configured and split. Most base stations are in built-up areas and elsewhere tend to be located within a mile or two of the main transport corridors.

2.4 Base stations consist of antennas installed on supporting structures such as masts or mounted on buildings and connected by feeder cables to transmission and receiving equipment. Networks are comprised of three sizes of base station:



- Macrocell base stations provide the main radio coverage infrastructure. Antennas for macrocells are usually mounted on ground-based masts, rooftops and other existing structures but may occasionally be within a building.

- Microcell base stations are used to infill and improve the main network, especially where the volume of calls is high. They are usually deployed later in the network rollout. There are a number of different types of microcell antennas. The most common are small boxes about the size of burglar alarms, which are mounted at street level typically on the external walls of existing structures. There are other types that are capable of being integrated into street furniture. They have a range of a few hundred metres. Microcells base stations are most suitable for transmitting signals to pedestrians.

- Picocell base stations have even smaller antennas and are generally sited inside buildings such as airports, railway stations and shopping centres.

Examples of Macrocell, Microcell and Picocell equipment.

2.5 Each base station is linked to the network by cable or by radio using one or more small microwave dish antenna. These dish antennas are usually between 0.3m to 0.6m in diameter, although in areas with high capacity demand they may measure 1.2m. The distance that a link travels also has a directly proportionate impact on the diameter of a dish antenna.

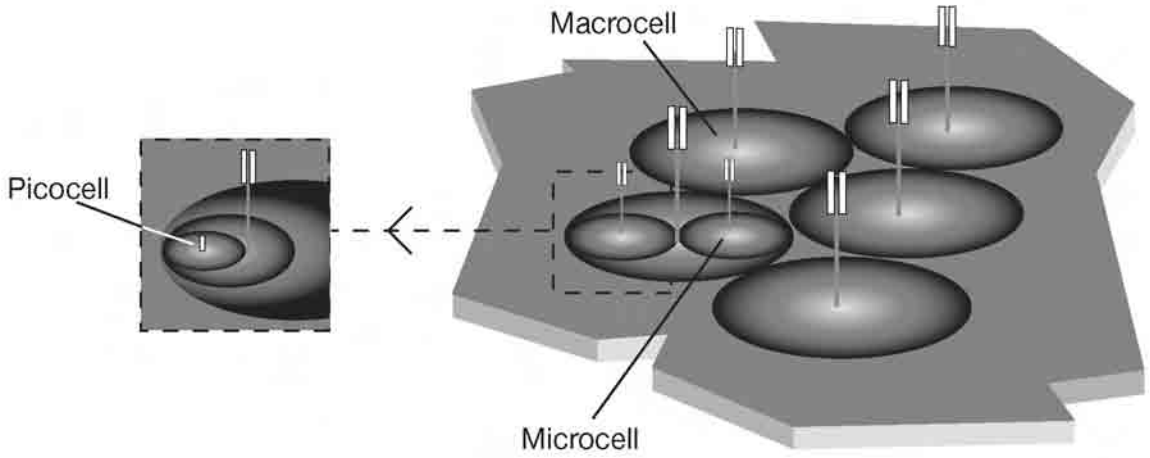
2.6 The original mobile systems, known as first generation (1G), date from the mid 1980's, and have now been decommissioned. Second generation (2G) systems which operate using the Global System for Mobile (GSM) technology (a digital standard for mobile telecommunications) are now in place, though operators are still extending coverage in some areas and improving capacity. 2G base stations antennas vary in height between 1.5 and 2.5m in length. These can be placed on redundant 1G masts, new lattice or monopole masts or other existing structures. 2G ground based masts are generally between 12.5m to 22.5m in height, although on occasion a 30m mast may be required. Short 'stub' masts on rooftops are typically 4m to 6m high. Standard 2G base stations have between 2 and 6 antennas per mobile operator. Antennas can be directional to cover a segment of the cell, or omni-directional sending the signals out in all directions.

Some operators are enhancing their services to use a common standard known as General Packet Radio Service (GPRS), sometimes referred to as 2.5G. This permits higher data speeds without physical alterations to the apparatus.

2.7 In May 2000 the government awarded five telecommunications licences to develop a 3G network using Universal Mobile Telecommunications Systems (UMTS) technology to the four existing 2G operators and a new operator. The licences will be valid until the end of 2021 and require each licensee to develop a 3G network covering at least 80% of the UK population by the end of 2007. 3G will enable a data transfer rate that is 200 times faster than 2G as well as a range of new services. These services could include such things as Internet access, e-commerce and video services.
The new licenses have been granted at a higher frequency from the existing 2G networks, which means:

Second and third Generation equipment on a rooftop site. The 3G equipment is highlighted.

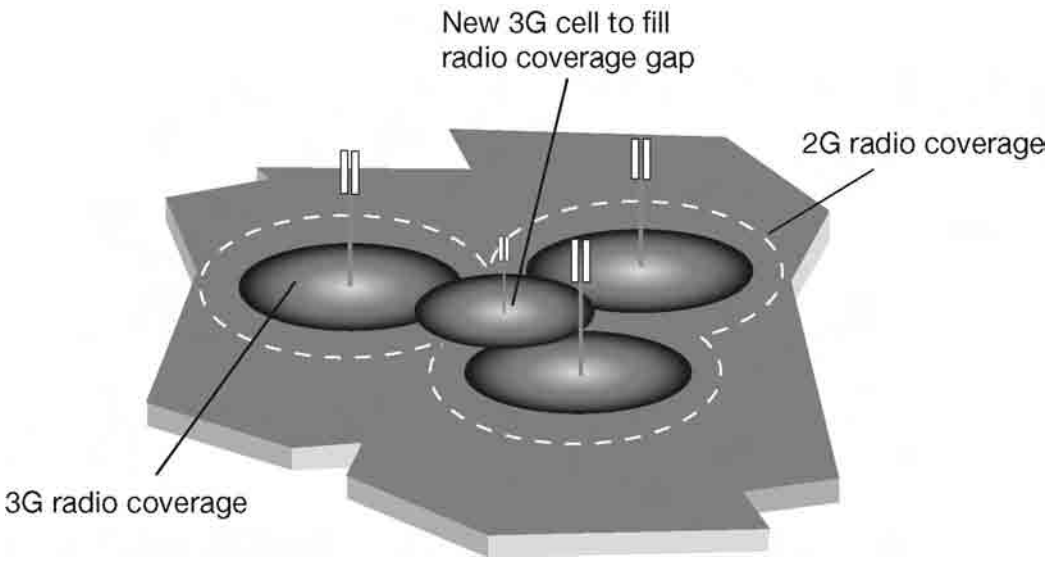
- a signal from the same locations as current 2G mobile sites will not travel as far. Because of this factor, to cover the same geographical area, the 3G sites have to be located closer together.
- 3G apparatus can generally be sited at a lower height than 2G.
- as a site gets more use the size of the cells will shrink, normally referred to as ‘Cell Breathing’. Gaps in coverage therefore need to be filled.



Second Generation Mobile Telecommunications Mast Cell Sizes

2.8 3G commercial services have been launched. The new operator is currently establishing a new network and is expected to primarily use existing buildings or other structures, including some masts used by other operators or radio site management organisations.

2.9 Standard 3G equipment looks similar to 2G. In most situations separate new 3G antennas will be required. The operators have indicated that they will try where possible to use 2G structures to erect 3G masts. For example it may be possible for existing 2G operators to replace their 2G antenna with a 'dual band' or 'tri band' antenna that can provide both 2G and 3G functionality. These multi band antennas tend to have a wider casing than 2G antennas.



Third Generation Mobile Telecommunications Masts Cell Sizes

2.10 A new generation of mobile technology seems to come forward approximately every 10 years. Some telecommunication companies are already thinking about fourth generation systems.

2.11 The process by which mobile operators select their sites is explained in Annex B.

Tetra and Pager Systems

2.12 Another mobile telecommunications system currently in use is Terrestrial Trunked Radio Access (TETRA) which is a standard for digital trunked radio. Presently Northern Ireland does not have any commercial TETRA systems in operation. The Police Service of Northern Ireland operates a system in conjunction with the Northern Ireland Fire Brigade and the Northern Ireland Ambulance Service. There are no plans to allow any commercial use, however some other statutory service providers such as Northern Ireland Electricity may have limited access available in the future. There are also a number of pager systems in operation.

2.13 TETRA and Pager systems can use a variety of antennas, ranging from 1.5m to 6m in length, which can be sited upon existing or new masts.

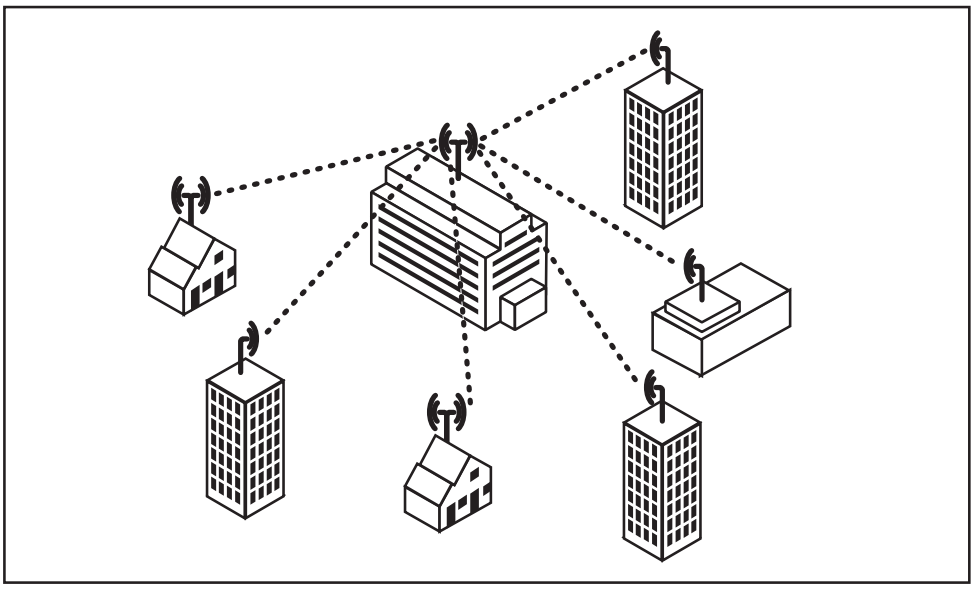
Private Business Radio

2.14 Private Business Radio (PBR) systems provide voice and data only communication over ranges up to 80km, dependent on the equipment used and terrain. PBR systems can be on-site for instance in supermarkets or offices, wide area as used by airports and taxi firms, or national and regional networks as used by road breakdown services. They utilise slim antennas, which due to their small size are often considered to be de minimis (see glossary).

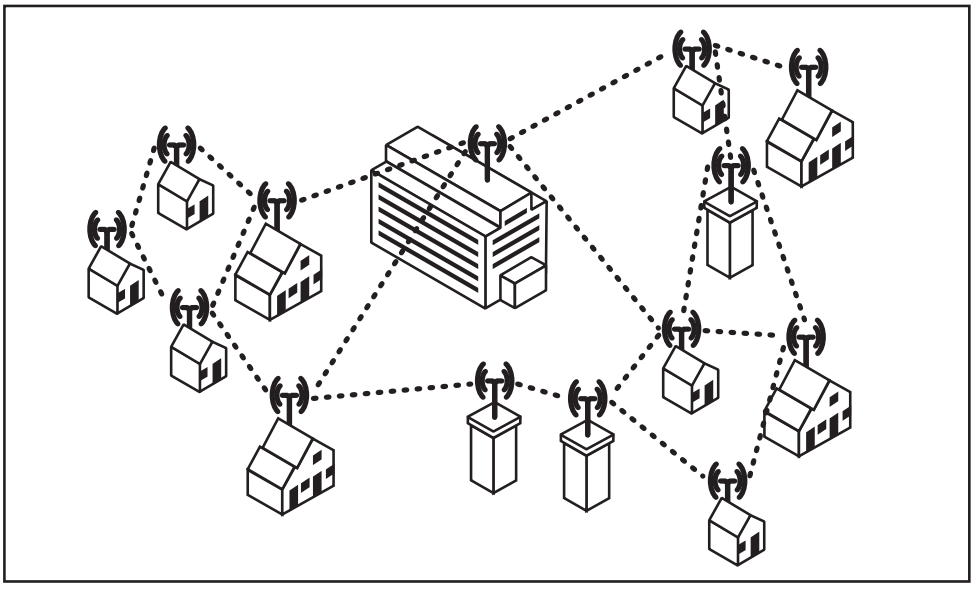
Fixed Radio Access (or Fixed Wireless Access)

2.15 Fixed Radio Access (FRA) systems use radio to connect the antennas on a users building and a telecommunications network. FRA provides a fixed telephone service that offers users fast Internet access by radio links instead of a conventional telephone line. It can deliver very high data rates and has the potential to transport a complete range of electronic traffic including telephony, high-speed data, television and multimedia services.

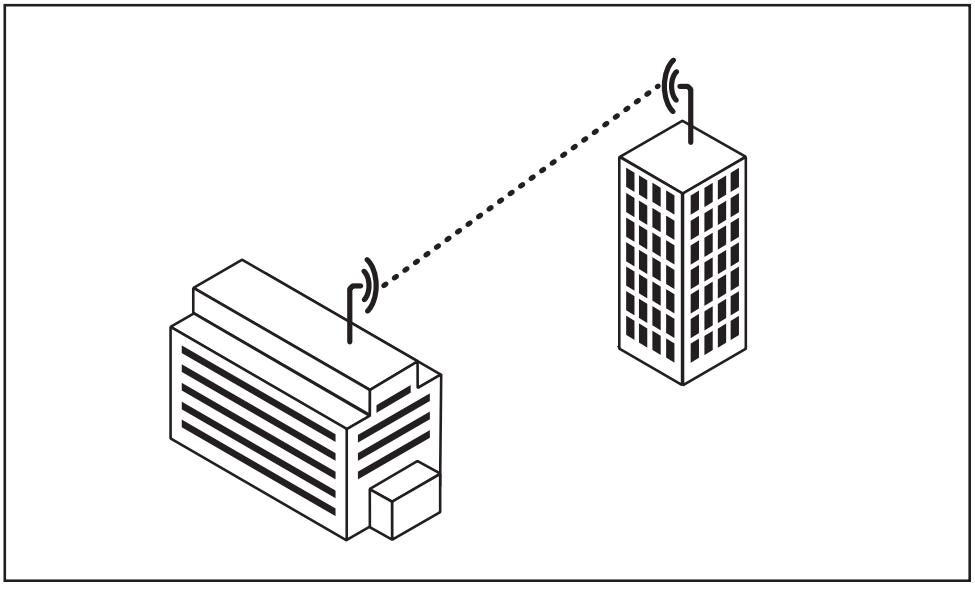
2.16 FRA base stations normally consist of a number of small antennas (usually between 50 and 75 cm in length) that can be located on masts or buildings and other structures. When base stations are placed on buildings or other structures they appear as a collection of mountings each with two small antennas attached. The masts are generally larger than mobile operators' masts to allow adequate support for the greater number of antennas and their greater wind loading. The antennas attached to customers' buildings are usually quite small and discreet. Due to the relatively low power of these systems, base stations have to be within about 1km of the consumer with direct line of sight free from obstructions such as hills, buildings, trees or large moving objects and hence there is less flexibility in the choice of location than for mobile services. Further information on factors affecting radio signals is available from Annex C.



FRA Point-to-Multipoint Network



FRA Multipoint-to-Multipoint Mesh Network



FRA Point-to-Point Network

Other Radio Telecommunications Systems

2.17 The long distance telecommunication networks, which provide the backbone infrastructure for telecommunications and broadcasting operators, sometimes use fixed radio links in addition to cable links. These radio links are provided by microwave dish antennas located on towers, buildings or other structures. Direct line of sight is needed and to cover long distances, or to circumvent obstacles, intermediate repeater radio stations are occasionally necessary.

2.18 Broadcasting antennas are generally installed on large lattice masts to maximise coverage. Installation of new broadcasting equipment will be required to facilitate the Governments planned change from the use of analogue to digital signals by 2010.

2.19 Telecommunication operators and broadcasters also use radio to communicate directly with satellites using dish antenna. These are sometimes referred to as 'satellite earth stations'. There are other systems in use including maritime, aeronautical and amateur radio systems, each with a variety of equipment.

Microwave dish antennas located on top of a broadcasting building in Belfast City Centre.

Satellite Television Broadcasting

2.20 Several broadcasters transmit signals from the UK and other countries. Television signals are beamed to a number of satellites from a satellite earth station and then direct to home from the satellite, to individual receiving antennas, the more common ones known as satellite dishes. Antennas have to be in direct line-of-sight of the geo-stationary satellite, and almost always have to be mounted outdoors. The satellites for the various services are in different orbital positions, and have to be received by separate antennas, unless steerable or other specialist antennas are used.

2.21 The location of a satellite dish on a building will therefore depend on the direction of the Satellite. The size of the dish will depend on the technology used, the strength of the signal and the possibility of interference from transmissions from other satellites that may be located nearby. In many cases, dishes of 60cm in size or less can be used, but a larger dish may also be necessary where:

- it supplies programmes to more than one television;
- it receives national or international programmes;
- it caters for broadband communication; or
- geographical position dictates the need for a larger dish.

New developments in antenna technology are introducing to the market new kinds of antennas with different visual characteristics.

2.22 Antennas for reception of digital satellite broadcasting signals are generally much smaller and discrete than their analogue predecessors.

Chimney Mounted Satellite dish.

Terrestrial Broadcasting

2.23 Digital terrestrial broadcasting will in most cases use existing TV rooftop aerials for domestic reception. The signals received are transmitted from broadcast masts. The current analogue services will in time be replaced with digital broadcasting for both radio and television, although both technologies will have to run in parallel for a period. Digital broadcasting will add to the range of services, for example, greater choice, interactive programmes, home shopping and internet access.

Standard Television Aerial.

3.0 Siting and Design General Principles

3.1 PPS 10 emphasises that telecommunications development must be undertaken in a manner that minimises environmental impact and visual intrusion. This applies not just in environmentally sensitive areas, but to all proposals for telecommunications development. The aim is that the equipment should become an accepted and unobtrusive feature of urban and rural areas. Sensitive siting and design in both urban and rural areas can reduce visual intrusion and assist in allaying public concerns.

Minimising Contrast

3.2 The fundamental principle in siting and designing equipment is to minimise the contrast between the equipment and its surroundings. There are two components to this:

- minimising contrast between equipment and people's expectations of a particular scene - for example dark green antennas on a wooden pole at the edge of a rural road are most likely to fit expectations about rural landscapes.

- minimising contrast between equipment and its immediate setting or background - for example fitting antennas to a floodlighting column or painting antennas to match the façade of a building.

Examples of masts and ancillary apparatus painted to minimise contrast with the surrounding environment.

Colouring is however important. The Impact of this mast could have been reduced if it was painted in a more appropriate colour.

3.3 The visual impact of equipment depends on how it is seen, both in terms of the image it conveys and its composition. In order to minimise contrast operators should:

- select a shape and material appropriate to the character of the area;
- keep the shape simple with clean lines, and fit all the elements, such as antennas, cables and ladders within the visual envelope of the basic shape;
- seek to develop a composition where the properties seem in proportion and balanced, for example masts that taper to the top are usually more acceptable;
- minimise the number of separate visual elements in a base station; and
- use regularity, order and symmetry in positioning equipment.
- use appropriate colouring having regard to the local context and backdrop of the site.

The Series of Options

3.4 In selecting the site and design, which minimises contrast or avoids unnecessary visual clutter, operators should consider the following series of options. The options are:

- installing small scale equipment and antennas;
- blending in and disguising equipment and antennas;
- installing antennas on buildings or structures;
- sharing existing sites, masts and other infrastructure; and
- erecting a new ground based mast.

3.5 The option with the least impact will vary according to site conditions, technical constraints, coverage and capacity requirements and landscape character. The series of options is therefore a guide or checklist rather than a rigid sequence of steps to be followed.

3.6 In assessing proposals for new masts, consideration will be given to potential cumulative effects e.g. when two or more masts are simultaneously visible or where several base stations can be seen in succession. Operators must also think beyond an individual proposal and consider how future telecommunications equipment can be integrated into the landscape. One mast on a site may be acceptable, but the cumulative effect of two or three might not.

Small Scale Equipment and Antennas

3.7 As demand for mobile phones has increased operators have looked for ways in which to increase coverage and the capacity of their networks. In urban areas this has predominantly been achieved through the development of microcells and picocells, which give coverage over very small areas such as individual streets and buildings. This kind of development is often regarded as de minimis as the antennas are very small and inconspicuous. Examples of de minimis development include antennas concealed as security boxes on shop fronts (see glossary for definition of de minimis).

3.8 Measures that can help to minimise the impact of small-scale antenna include:

- painting them to reduce contrast with their background;
- placing them in areas of shadow on elevations such as under eaves or plinths;
- keeping equipment to a minimum and as uncluttered as possible;
- avoiding contrast with or compromising architectural detail;
- installing them in areas that are inconspicuous; and
- hiding cable runs so that they are not visible on the façade of a building.

Examples of well integrated small scale antennas.

Blending in and Disguising Equipment

3.9 There is a range of techniques to blend equipment in with its surroundings and scope for creative and imaginative solutions. Most radio telecommunications equipment can be painted to match its background. This can often be an effective means of reducing contrast. Glass Reinforced Plastic (GRP) can be moulded into any shape, coloured or painted to disguise or conceal equipment. It can be designed to match the texture and colour of a building or shape of an architectural feature, such as a chimney or stone plinth. Antennas can also be incorporated into flagpoles or sculptural elements attached to buildings.

Equipment disguised as a chimney pot.

3.10 Antennas and other equipment can be blended in and disguised as street furniture, such as street lighting columns. Such installations need to respect the townscape qualities of an area, particularly locally valued significant buildings and features. Care must be taken to avoid creating street furniture clutter, which would limit the freedom of movement of pedestrians, particularly those with mobility difficulties.

St Stephen's Church in Edinburgh has eight mobile telecommunications antennas mounted behind fibreglass panels painted to match the stonework at the top of the tower and a cabin inside the tower itself.

3.11 There are a number of mast designs that attempt to look like trees.They can however appear incongruous and thus visually intrusive, if poorly sited or designed. They are less likely to contrast with the landscape if they;

- replicate a type of tree common in the area;
- are sited within or next to a group of real trees;

- are associated with new tree planting where no groups of trees are available or existing planting needs supplementing;

- minimise the visual impact of the equipment housing and fencing.

Examples of masts disguised as trees. This approach may not always be successful.

3.12 It may be possible for public works of art to be commissioned which incorporate antennas or complete radio base stations. They can enhance the landscape and strengthen the identity of a place. Possible locations for public art are:

- in squares and plazas;

- alongside major transport routes; or

- at transport intersections, such as roundabouts.

Care will be needed in such proposals to ensure they do not compromise road safety or traffic progression during maintenance.

Example of Public works of art which incorporate antennas or complete radio base station.

Installations on Existing Buildings and Other Structures

3.13 A wide range of buildings and other structures can be used for siting equipment. These may include:

- tall chimneys
- water towers;
- floodlighting towers;
- office and tower blocks;
- churches; and
- agricultural silos.

Telecommunications equipment installed on top of a large office block in Belfast.

3.14 The architectural style and materials used in a building or other structure will help influence the siting and design of equipment. Buildings or other structures of historic or architectural value will usually only be capable of accepting the installation of equipment where it can be disguised or concealed. There may however be instances where no installation is acceptable. Modern buildings, or buildings that already have telecommunications equipment sited on them, may be more suited to accepting new equipment.

Antenna equipment located behind clock face/ within a church tower / within the roof of a building.

3.15 The aim is that equipment on a building or other structure should:

- be coloured to match the background or reduce contrast;
- be in proportion to the size of the building or structure;
- relate to the architectural form;
- have minimal impact on the roof line;
- respect important views or skylines; and
- avoid a visually damaging cumulative effect.

3.16 Placing equipment below a roofline or against existing rooftop structures, such as a plant room and painting it a matching colour minimises the visual impact and protects the building's silhouette. These positions may not provide exactly the same level of coverage as a position above the roofline but there may be technical solutions to overcome gaps, such as installing microcell antennas in areas that experience shadowing.

An example of a rooftop cluttered with antenna.

3.17 Positioning equipment in a group with symmetrical order will help achieve a balanced composition. For technical reasons this may not always be possible, but encouraging this type of arrangement rather than scattering equipment across a rooftop will help the various elements appear as a single feature.

Antenna placed below the roof line of an existing building and coloured appropriately to minimise visual impact.

3.18 The use of existing buildings and other structures may be constrained by structural limitations. For example many were not designed to take the additional weight and wind loading of radio telecommunication equipment. Checking that the loading capacity can hold the proposed installation is a matter for the operator and the building control authority.

3.19 Existing buildings and structures may affect radio signals.

Two pieces of telecommunication equipment. Unfortunately only one mast is painted to minimise visual impact.

Sharing Existing Sites, Masts and Other Infrastructure

3.20 The Electronic Communications Code specifies the need to encourage sharing of the use of electronic communications apparatus. Evidence of this should accompany planning applications. Mast sharing will often enable cheaper installation. It is key to the Departments policy to mast share, however it may not be the optimum solution in all cases. Masts that accommodate several systems can, in certain cases look quite cluttered and ungainly resulting in increased visual intrusion. Other constraints on mast sharing include;

- Coverage Problems –The location of an existing mast may not present the best position to fill a gap in second operator's coverage. This could result in additional sites being required.

- Radio Interference – Antennas need a set amount of vertical separation, usually a minimum of 1 metre, although a separation of 0.5 metres can sometimes be achieved between apparatus belonging to one operator. The degree of separation is an important matter in assessing the visual impact of a shared mast.

- Structural Loading – Existing masts may need to be replaced or strengthened with a bigger structure with a consequent effect on visual amenity. In this situation a decision will have to be made whether the increase in size is preferable to an additional site.

An example of a slim-line monopole.
A simple well-proportioned installation.

- Third Party Property Rights – In some instances the lease agreement with the site owner may not allow for sharing or for the extension of the compound. Where extra space is required to accommodate either a larger mast and/ or additional apparatus such as radio equipment housing, the site owner must be willing to enter into an agreement with the operator in order that the proposal can progress.

3.21 Operators are advised to explore the various ways of overcoming these constraints before submitting a planning application. If this has not been done the Department will normally seek further Information.

3.22 In any instance where there is a dispute regarding the sharing of an existing mast or site, either party may ask the Director General of Telecommunications to resolve the matter. If the Director General considers it appropriate, he may direct the relevant telecommunications operators to share. The powers available under the Regulations do not, however, cover the refusal by a third party, such as a landowner to allow shared use of a mast.

3.23 In assessing proposals for a new mast the Department may wish to discuss with operators whether certain locations have the potential for future mast sharing, and if so be satisfied that it can accommodate additional equipment.

3.24 An alternative to mast sharing may be site sharing. This involves a new installation being located in close proximity to an existing one. One mast of good design may go relatively unnoticed but a number of masts could draw the eye and provide a prominent focus. Site sharing will appear more visually acceptable if the masts and other base station elements - equipment housing, power supply, access tracks and fencing - appear as a single group.

3.25 When deciding whether the dispersal of masts is preferable to site sharing, operators need to consider the area's character. Landscape and visual assessment techniques may be needed to help to decide which approach minimises the landscape and visual impact.

New Ground Based Masts

3.26 Developing a new ground-based mast should only be considered when other options are not possible or where it represents a better environmental solution. In order to minimise the visual and environmental impact the following should be considered;

- Placing a mast near to similar structures will minimise contrast so that the overall effect is not cluttered. For example, industrial and commercial premises, pylons and lampposts.

- Locating a mast within an existing group of trees and/or planting new trees and shrubs can help integrate it into the landscape. The edges of woodlands can be particularly suitable locations for new masts. To ensure long-term screening new planting around the site should be provided. Alternatively woodland or existing groups of trees around the site could be purchased and managed to retain screening.

Masts located within a group of trees at a major traffic junction

An ornate lamp post microcell

- New planting will not however be appropriate in all landscapes. It may need to be extensive in some landscapes to avoid appearing as an isolated block that emphasises the mast. On some exposed sites where there are no trees and screen planting is impractical, consideration should be given to disguising the equipment or using other landscape features to help conceal it.

- Masts, which have complex designs, are more likely to dominate, and discord with, the landscape and have adverse visual impact. Slim-line monopoles appear as simple well-proportioned installations and are often a good solution. They are however generally not suitable for sharing and their overall simplicity and balanced proportion may be lost by installing additional antennas. To support a number of antenna systems a larger mast is usually required. A simple mast that minimises the amount of visual information will generally be perceived as more acceptable.

An example of a slim-line monopole.
A simple well-proportioned installation.

- Appropriate colouring; Masts seen against the sky, for example, are best left in their galvanised state or painted pale grey. Against a wooded backdrop a matt green or brown colour scheme is generally more appropriate.

- In complex rural landscapes with many vertical features, dispersing masts may minimise impact. In rural landscapes devoid of vertical features concentrating masts at one point may be preferable.

- A mast that breaks the skyline or is sited on a prominent ridge is generally not desirable as it creates a visual focus, which draws the eye away from the natural landscape. The best location in many mountainous and hilly landscapes will be on the lower valley sides. This will help provide a backcloth when viewed from the valley floor.

3.27 When making an application for a new ground-based mast operators will need to set out the details of all sites considered. This should set out the site name, address and grid reference and explain in plain english why the alternative sites have been discounted.

Spreading masts throughout a large open landscape may extend the impact over a wider area than site or mast sharing

Spreading masts throughout a landscape with many existing landscape elements may have less impact than site or mast sharing

Other Base Station Components

Equipment Housing

3.28 Radio telecommunications equipment housing can range in size from a small cabinet to a purpose built cabin facilitating several operators. It can be placed within a building, underground, on the ground or on a rooftop. The size of equipment housing for a macrocell base station can vary significantly. Equipment cabinets for microcell base stations are sometimes located within adjacent buildings, or incorporated into the supporting structure. The equipment is connected to antennas via feeder cables. Keeping antennas and equipment housing close to one another reduces signal loss. However, in some instances separating the antennas and equipment housing may enable better siting, for instance by allowing the equipment housing to be located next to an existing track. Equipment housing can be painted to blend in with its background, disguised as street furniture in urban areas, or designed as a positive feature that complements the townscape.

Equipment cabinet adjacent to a monopole mast.

A National Park stone cabin to house equipment

3.29 In rural areas existing landscape features such as planting or rocky outcrops can provide screening. New planting can also help to screen equipment housing. In sensitive locations, thought should be given to surrounding equipment housing with a well designed earth embankment or in the particular circumstances where adequate heat dissipation can be achieved and water ingress prevented then placing it partially or completely underground may be possible. In urban areas unobtrusive locations away from principal facades, important street frontages, prominent corner locations or any significant streetscape features are preferable. A free standing small equipment cabinet may look better when placed next to another item of street furniture, for example a bus shelter or telephone kiosk. Additional equipment housing is usually required where operators are sharing masts or rooftop sites. This should be well sited and in sensitive locations it may be necessary for operators to share a single purpose built equipment cabinet. In all cases cumulative impact will need to be considered.

3.30 Equipment housing placed on footpaths must not be sited so as to impede pedestrian movement. Sufficient space must be left for all members of the public to pass without hindrance, particularly those with mobility difficulties.

Equipment Compounds

3.31 Fencing may be required around a mast and equipment housing. The scale of the fencing required will be dependent on location. In urban areas higher fencing may be required. In rural areas a post and rail or a post and wire fence may suffice. In all locations the form and colour of fencing should be appropriate to its setting.

Examples of telecommunication equipment compounds. Better use of colouring would have reduced contrast.

3.32 The impact of an equipment compound can be minimised if the compound is not surfaced or by using natural surface materials which match the landscape character. In some cases the equipment can be attached directly to solid rock where it is exposed at surface level. Any hard surfacing should be permeable and kept to the minimum necessary in order to limit environmental and visual impact.

Power Supply

3.33 Radio telecommunications equipment requires a power supply. This should be easily achievable within an urban area. In remote locations however there may be no suitable sources nearby. Often the cheapest way to provide power to a remote location is by installing new overhead powerlines, but this will usually add to the landscape impact. In forested areas it will require maintenance of a clear corridor. In sensitive locations it is preferred to underground power supplies for all or part of their length. Care must be taken to ensure sensitive reinstatement of the damaged ground. Undergrounding of cabling will not be considered appropriate in areas with known archaeology.

3.34 Another option in rural areas is to use a generator, though refuelling and maintenance will add to the operator's costs. Where there is no access track all terrain vehicles can cause erosion. Ideally therefore a generator should be sited where it can be refuelled from an existing road taking account of road safety considerations or access track, and connected by cable to the base station. Where a generator is proposed consideration will be given to potential noise impacts.

Access Tracks

3.35 Access tracks can sometimes be more visually prominent in the landscape than masts. In particular they can have a greater landscape impact at high elevations where there is a lack of natural screening and the ground takes longer to recover. The construction of access tracks and other less formal access arrangements can also be damaging to archaeological or nature conservation interests. Locating a mast next to an existing track is always preferable.

3.36 Lattice masts can generally be erected without an access track. The erection of a monopole mast usually requires an access track to allow a crane to lift it into position. There are a number of construction techniques including floating tracks or green roads, which can reduce the environmental impact. Furthermore, temporary access can be constructed and the track removed after construction is complete. Access for maintenance can be on foot or by all-terrain vehicles. Frequent use by all-terrain vehicles on wet or soft ground can itself lead to deep rutting and multiple tracking particularly where several operators are sharing a mast or site.

3.37 It may be feasible to construct a track to carry heavy vehicles during the construction stage then part-reinstate the ground to leave a narrower track suitable for small maintenance vehicles. Restricting entry to the track could then deter larger vehicles.

3.38 The impact of a new access track can be reduced by;

- relating it to field boundaries and other features;
- following the boundaries of natural vegetation; and
- avoiding archaeological and nature conservation sites.

Redundant Equipment

3.39 When equipment becomes redundant it must be removed and the site restored to its former condition at the operator's expense. Code systems operators are required to do this by the Telecommunications Act 1984 (as amended by the Communications Act 2003), however a condition will normally be attached to all planning consents. The equipment includes all cable runs, fixings and ancillary items, and all fixing holes should be made good. Any access tracks should also be returned to an appropriate natural state.

4.0 Siting and Design – Area Guidance

4.1 The scale, massing and height of proposed development should be considered in relation to that of any adjoining buildings; the surrounding topography; the general pattern of heights in the area; and views, vistas and landmarks.

Environmentally Sensitive Features and Locations

4.2 All telecommunications development, including the siting of masts, equipment housing, access tracks and power supplies, should be planned to avoid adverse impact on sensitive features and locations of archaeological, built or natural heritage value. This includes archaeological remains, historic monuments, listed buildings, conservation areas and areas of townscape character, areas of outstanding natural beauty, sites of nature conservation importance, sites where there are protected species, local landscape policy areas and other environmental designations. Applicants should submit suitable evidence to show that alternative locations in less sensitive areas have been investigated and cannot be used. Where such locations cannot be avoided extra care will be required to ensure that the visual and environmental impact of the telecommunications apparatus and any ancillary works is minimised.

4.3 There may be a need to obtain a separate listed building consent, under Article 44 of the Planning (NI) Order 1991, for any internal or external works to a listed building in any manner which would affect its character as a building of special architectural or historic interest. Similarly, any works to, or affecting the site of, a scheduled monument require scheduled monument consent from the Department's Environment and Heritage Service under the Historic Monuments and Archaeological Objects (NI) Order 1995.

4.4 Further information on the Department's policies for the protection of landscape and heritage features can be found in PPS 2 ' Planning and Nature Conservation' and PPS 6 'Planning, Archaeology and the Built Heritage' respectively.

PPS 2: Planning and Nature Conservation and
PPS 6: Planning, Archaeology and the Built Environment.
Urban Areas

Urban Areas

4.5 Development of radio telecommunications equipment will continue to be concentrated in urban areas, where demand is greatest. Many opportunities exist to sensitively site telecommunications installations, to blend in and disguise equipment and make use of existing buildings and other structures. Wherever possible operators should seek to use small-scale equipment.

4.6 Areas that already have engineered forms and structures will often offer the best opportunity for siting equipment. Less visually sensitive areas where the use of standard equipment may be more readily acceptable include:

- industrial areas;
- large traffic junctions;
- land adjacent to railway lines;
- landfill sites;
- wastewater treatment sites;
- on or near water towers; and
- floodlighting towers.

A Lattice structure located within an industrial area

A mast located at a wastewater treatment site

A mast located between a Dual Carriageway and a railway line

4.7 Visually sensitive locations within urban areas where it is particularly necessary to take positive steps to blend in or disguise equipment include:

- conservation areas and areas of townscape character;
- scheduled ancient monuments and their settings;
- listed buildings and their settings; and
- recreational areas, e.g. public open space.

4.8 EHS Built Heritage will be consulted on proposals affecting archaeological sites or listed buildings.

Rural Areas

4.9 Access to telecommunication services in rural Northern Ireland is important for business, educational and social use. The landscape quality of rural areas can however be easily damaged by insensitive telecommunication installations. The impact is often heightened because equipment can be seen over long distances. To overcome this operators should seek to develop creative siting and design solutions.

4.10 Understanding an area's landscape will help in designing sensitive proposals. It is best practice to avoid prominent locations visible from visitor attractions, scenic viewpoints, or the main line of vision from a road. If unavoidable, then it is preferable that equipment is disguised or concealed. Operators should consider the use of a landscape architect who can advise on:

- areas to avoid;
- the location with the minimum landscape impact; and
- mitigation measures to reduce the landscape impact.

4.11 Familiar features can be used to gauge the scale of a landscape, but some landscapes can seem larger than they really are because of a lack of scale indicators. A new radio telecommunication installation could act as a scale indicator and reduce the sense of space. Disguising and concealing techniques are appropriate for such areas. If a new mast is unavoidable its impact can be minimised by making it slim and simple in form.

4.12 The key natural heritage issue will be the equipment's impact on the landscape. Other important issues are:

- Loss of habitat - the development of a mast may not in itself contribute to any significant loss of habitat but consideration should be given to the associated development of new access tracks, widening existing tracks, powerlines, underground cables and equipment housing.
- Disturbance to wildlife especially during the breeding season –construction should be timed to avoid any sensitive periods.
- Indirect habitat damage through modification of drainage patterns - this could arise from construction activities such as cable trenching or access road formation.
- Earth Science - impact on important rocks, fossils, landforms, soils and land forming processes.

4.13 In sensitive rural locations it will often be useful for applicants to submit photographic montages or panoramic drawings of the proposal as it would look when completed from various views of the development site. The applicant should consider the use of a landscape architect for this work.

4.14 EHS Natural Heritage will be consulted on proposals that might affect natural heritage designations. Early consultation with the Planning Service and EHS will help the design process. In exceptional circumstances specialist advice such as a habitat survey may be requested.

4.15 The effect of inappropriately designed structures such as masts are particularly damaging in areas with wild land character, uninhabited and often relatively inaccessible countryside where the influence of human activity on the character and quality of the environment has been minimal. In these locations a poorly designed and sited mast could change a person's whole perception of the area. If avoiding wild land is not possible equipment must be blended in or disguised.

5.0 Emergency Development

5.1 In the event of an emergency, which results in telecommunications apparatus becoming unserviceable, moveable temporary emergency equipment can be put in place to allow the continuation of operations. Under the Planning (General Development) (Amendment) Order (Northern Ireland) 2003, code system operators must notify the Department in writing as soon as possible (not later than 3 working days thereafter) after the emergency begins, stating the nature of the emergency. Emergency equipment can only be used for a maximum period of six months. An ICNIRP certificate should be supplied with notification of use of emergency equipment. If the existing telecommunications apparatus is still not operational after six months any replacement structure or continued use of movable emergency equipment will require planning permission.

An example of a temporary Telecommunications Mast.

5.2 Emergency equipment is allowed as permitted development, but apparatus must conform to the following conditions where operationally practicable. Movable equipment must be located as close as possible to the existing unserviceable telecommunications apparatus. It must not exceed the height of the existing apparatus. At the expiry of the relevant period[1] it should be removed from the land and the land restored to its condition before the development took place.

5.3 The cause of equipment failure can mean it is not always possible to locate moveable emergency apparatus adjacent to the existing equipment. Damage caused by for example explosion, flooding, or land slippage might mean locating temporary equipment off site. An explanation for an offsite location must be submitted in writing to the Department with the notification of the requirement to use emergency equipment.

[1] Relevant period means a period which expires either 6 months from the commencement of the use of the emergency equipment or when the need for the use ceases, whichever occurs first.

5.4 When emergency equipment is no longer needed it must be removed and the land should be restored to its former condition at the operator's expense. Code system operators are required to do this by Telecommunications Act 1984, as amended by schedule 3 of the Communications Act 2003. The equipment, which should be removed, includes all cable runs, fixings and ancillary items, and all fixing holes should be made good. Any access tracks should also be returned to an appropriate natural state.

6.0 Contents of a Planning Application

6.1 The quality of information submitted as part of a planning 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 planning officers and elected representatives exactly what is being proposed and its likely impact. By adopting high standards unnecessary time and effort in trying to explain proposals can be avoided and help allay concerns that ambiguous and incomplete information can cause.

6.2 In addition, good quality submissions are likely to result in speedier and better informed decisions. The Mobile Phone Operators have adopted a series of commitments to best siting practice. This includes the development of a standard supporting document for planning permission. Annex D and E sets out the operators Ten Commitments and the Traffic Light Model, which operators use to calculate the level of consultation they will undertake prior to the submission of individual proposals.

6.3 A summary of views, raised by members of the public, should be included when submitting a planning application together with responses to these comments and copies of the actual letters.

6.4 The following is a checklist of what Planning Service will expect to be included in a submission by the operator or on their behalf by an appointed agent.

Application Forms - (Completed and signed)

- Form P1 – Application for permission to develop land. The fee should be entered in the appropriate section. The address should be site specific and not simply the road name or townland.

- Form P2 – Certificate under Article 22 of the Planning (Northern Ireland) Order 1991. This form constitutes a statement of ownership, not proof of ownership.

- Form NN1 - The neighbour notification form. This should include the addresses of all occupiers of buildings on sites which adjoin the boundary of the application site, including those along any access track or private lane, and those which would adjoin the boundary but for an entry or a road less than 20 metres wide.

Maps

- An O.S. base map to an appropriate scale (usually 1:25,000) showing the cell centre and existing sites within the cell and also the location of adjoining cells and sites.

- An O.S. base map to an appropriate scale (usually 1:50,000 or 1:25,000) highlighting all alternatives that have been considered. This should focus on existing masts and structures.

Drawings

6.5 Site Location Plan – (minimum scale 1:2500, preferably on an O.S. base). Should show:

- the location and means of access (including visibility splays) from a public road to the site clearly outlined in red (right of way hatched in green);
- where there is no O.S. base available, the location plan should show the position of buildings within 100m and at least two public highways for reference.

Site Layout Plan – (minimum scale 1:500). Should show:

- the boundaries of the site;
- the position of existing and proposed equipment including all antennas, and radio equipment housing as well as ownership by individual operator;
- any means of enclosure;
- the position of any adjoining buildings and/or trees;
- any landscaping proposals, including boundary proposals;
- the means of access (rights of way should be hatched in green);
- existing site features.

A clear differentiation between existing and proposed equipment should be made. If this cannot be achieved separate drawings shouldbe submitted.

Elevations – (minimum scale 1:100). Should show:

- details of height, width and appearance of the equipment and any radio equipment housing. Also any colour proposals;
- similar details of any structure and/or buildings to which the equipment will be attached;
- details of any equipment that is to be removed (if applicable);
- any adjacent buildings, trees, safety/ security fencing or other telecommunications equipment at scale to the development.

Equipment on buildings

6.6 Where proposals relate to the installation of equipment on buildings the following additional plans may be required.

Roof Plan – (appropriate scale e.g. 1:100). Should show:

- the whole roof of the building;
- details of existing and proposed equipment including all antennas, radio equipment housing, access platforms and air conditioning plant.

Existing and proposed Cross-sections

6.7 This should be provided where proposed equipment is partially hidden in the elevations by other existing equipment or roof structures.

Supplementary Information

6.8 The following additional information should also be provided:

- site details – name, reference and location of proposal with reference to address;
- base station type (e.g. macro or micro);
- details of consultation carried out under the ten commitments (if relevant);
- operators rating of site under Traffic Light Model;
- details of consultation carried out with CAA/Secretary of State for Defence/ Aerodrome operator (if relevant);
- area of search;
- details of the proposed structure including the type of structure and its dimensions, height of existing building and details of the size of the equipment housing and materials;
- a statement explaining the reasons for the choice of design and detailing the consideration given to measures that mitigate the visual and environmental impact of the proposal;
- technical Information including the frequency, modulation characteristics, power output and height of the proposed antenna;
- technical justification – details about the purpose of the site And why the particular development is required;
- details of alternative sites rejected with a justification for rejecting them. This should include existing masts, structures and other buildings within the search area;

- an explanation if no alternatives considered;
- any other relevant information.

Further Information

6.9 It may in certain circumstances be appropriate for the Department to request;

- A Visual Impact Assessment – This should consist of a before and after photomontage of the radio base station, fencing, landscaping and access. Such assessments will normally be expected to accompany application for new rural mast sites.
- Acoustic Report – Where a proposed installation involves equipment that may generate noise. A report may be requested to assess any likely noise disturbance.

6.10 All plans submitted should have a title, a reference number, North point and scale.

Declaration of Conformity with ICNIRP Public Exposure Guidelines (ICNIRP Certificate)

6.11 All applications for planning permission should be accompanied by a signed declaration that the equipment and installation has been designed to be in full compliance with the requirements of the radio frequency (RF) public exposure guidelines of the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

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

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

6.14 The emissions from all mobile phone network operators’ equipment on the site are taken into account when determining compliance.

6.15 In order to minimise interference within their own networks and with other radio networks and cellular networks, operators will operate their networks in such a way that radio frequency power outputs are kept to the lowest levels commensurate with effective service provision.

Annex A - Planning Policy Statement 10

Policy TEL 1
Control of Telecommunications Development

The Department will permit proposals for telecommunications development where such proposals, together with any necessary enabling works, will not result in unacceptable damage to visual amenity or harm to environmentally sensitive features or locations.

Developers will therefore be required to demonstrate that proposals for telecommunications development, having regard to technical and operational constraints, have been sited and designed to minimise visual and environmental impact.

Proposals for the development of a new telecommunications mast will only be considered acceptable by the Department where the above requirements are met and it is reasonably demonstrated that:

(a) the sharing of an existing mast or other structure has been investigated and is not feasible; or

(b) a new mast represents a better environmental solution than other options.

Applications for telecommunications development by Code System Operators or broadcasters will need to include:

(1) information about the purpose and need for the particular development including a description of how it fits into the operator's or broadcaster's wider network;

(2) details of the consideration given to measures to mitigate the visual and environmental impact of the proposal; and

(3) where proposals relate to the development of a mobile telecommunications base station, a statement:

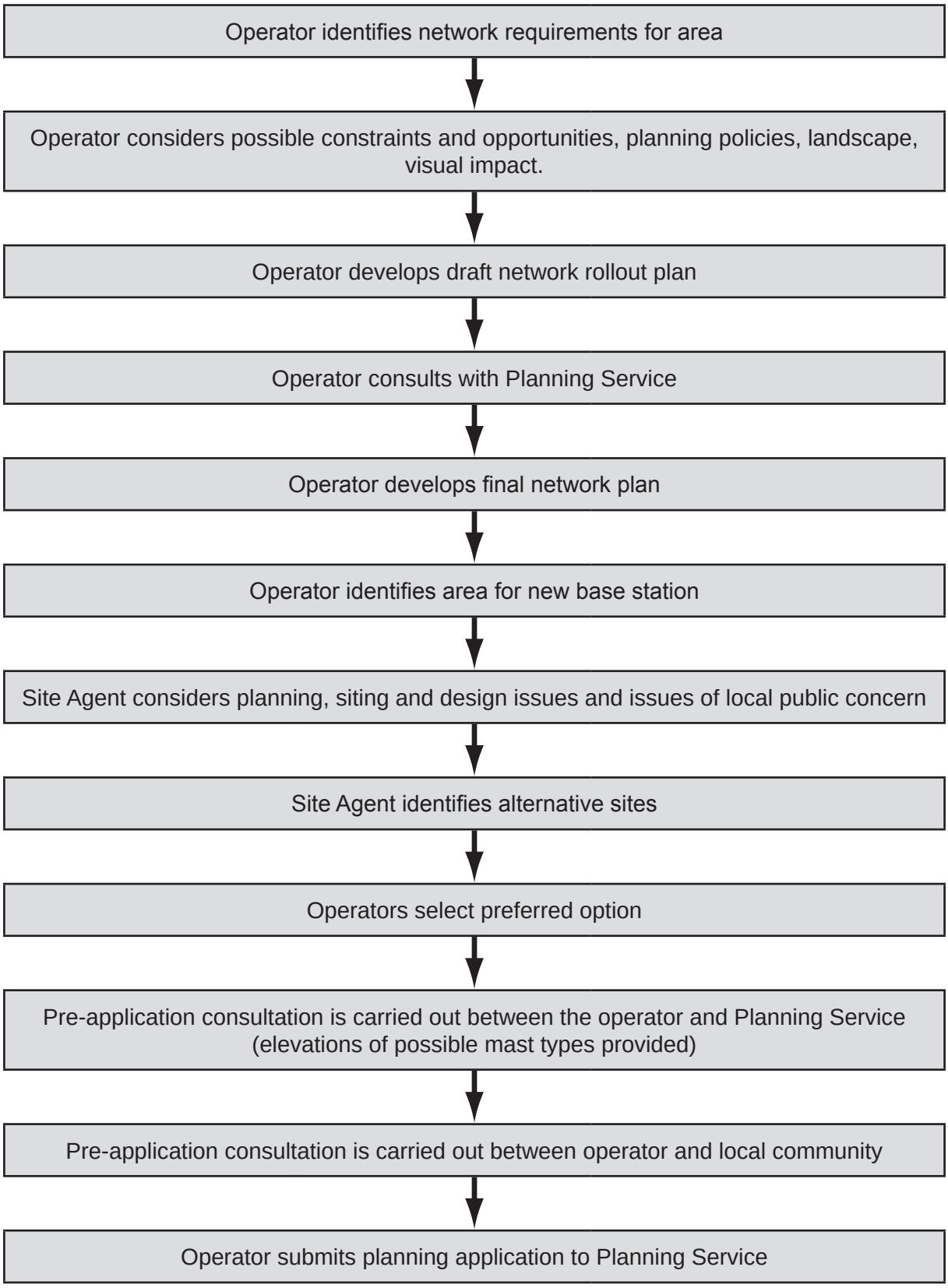
- indicating its location, the height of the antenna, the frequency and modulation characteristics, details of power output; and

- declaring that the base station when operational will meet the ICNIRP guidelines for public exposure to electromagnetic fields.

Where information on the above matters is not made available or is considered inadequate the Department will refuse planning permission.

Annex B - Site Selection for Mobile Operators

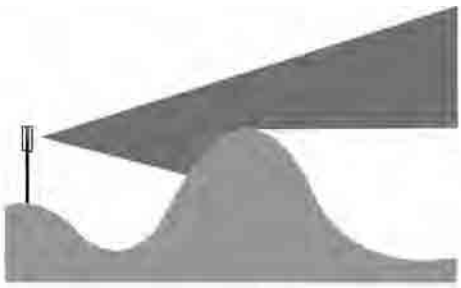
The flow chart below sets out the stages that take place in taking forward a mobile telecommunications development.



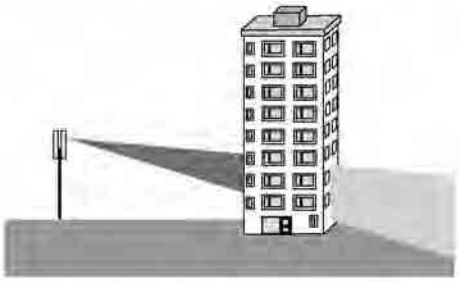
Annex C – Factors Affecting Radio Signals

1. In a similar way to light, radio waves travel in straight lines and are affected by obstructions, which can alter the radio signal. The main factors that affect radio signals are:

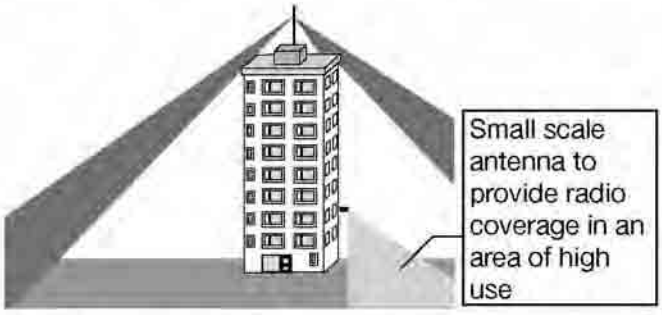
Shadowing	-	Terrain or Buildings partially reducing signal.
Attenuation	-	Strength of signal is reduced when passing through a building.
Diffraction	-	a signal can bend around an object to a limited extent.
Reflection	-	this reduces signal strength but may also aid coverage.



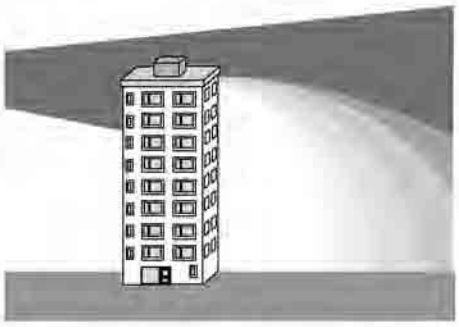
Signal loss due to shadowing from terrain



Signal strength reduced by attenuation when passing through a building

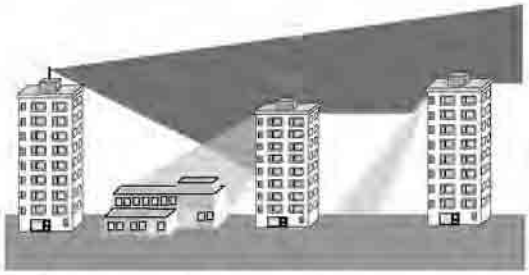


Signal loss due to shadowing from buildings



Signals can 'bend' round obstructions to some extent (diffraction)

Signal strength reduced by reflection from walls and other objects



Reflection can be used to achieve radio coverage in urban areas

2. Radio waves will penetrate certain materials such as brick, stone and steel. The reduction on signal strength depends upon the density of the material. This must be considered when providing networks within buildings.

3. The location of the transmitter antennas is important as signals from one cell can interfere with signals from a cell nearby operating at the same frequency. The antenna will usually have to placed high up in order to avoid blind spots created by the layout of buildings or terrain.

Annex D - Operator Commitments

The Mobile Operators Association (MOA), representing the main mobile telecommunications operators, has made the following ten commitments to:

1. develop, with other stakeholders, clear standards and procedures to deliver significantly improved consultation with local communities;

2. participate in obligatory pre-rollout and pre-application consultation with local planning authorities;

3. publish clear, transparent and accountable criteria and cross-industry agreement on site sharing, against which progress will be published regularly;

4. establish professional development workshops on technological developments within telecommunications for local authority officers and elected members;

5. deliver, with the Government, a database of information available to the public on radio base stations;

6. assess all radio base stations for international (ICNIRP) compliance for public exposure, and produce a programme for ICNIRP compliance for all radio base stations as recommended by the Independent Expert Group on Mobile Phones;

7. provide, as part of planning applications for radio base stations, a certification of compliance with ICNIRP public exposure guidelines;

8. provide specific staff resources to respond to complaints and enquiries about radio base stations, within ten working days; (See Annex F)

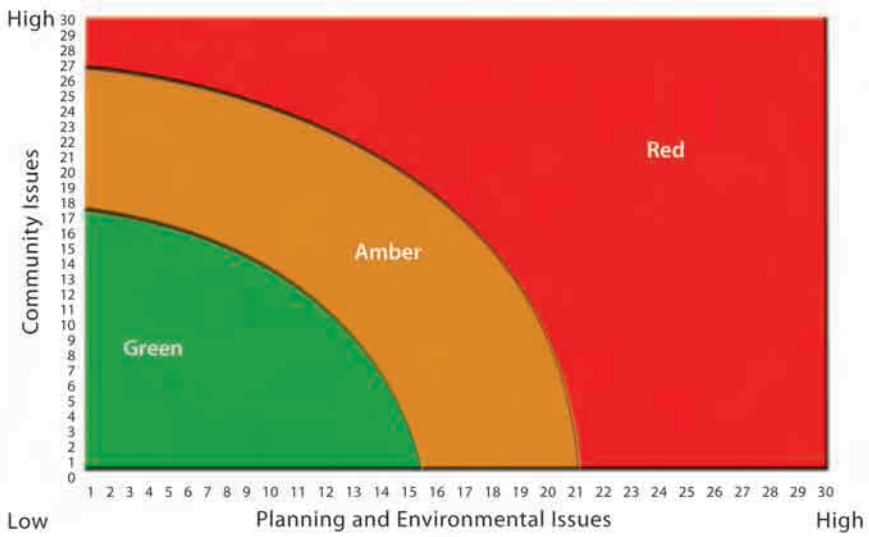
9. begin financially supporting the Government's independent scientific research programme on mobile communications health issues; and

10. develop standard supporting documentation for all planning submissions whether full planning or prior approval[2] .

[2] As from 21st July 2002 Prior Approval no longer exists in Northern Ireland. Applications for Mobile Phone Masts are subject to full application procedures.

Annex E - Operators Traffic Light Rating Model for Public Consultation

As part of the operators ten commitments as outlined in Annex D the operators have devised a traffic light model to improve consultation and communication with local communities prior to submitting planning applications to the planning authority. This is additional consultation taken independently of and consultation process undertaken by the Department.



Community Issues

Views and attitudes of local communities	Previous residents activity and likely community views.	0 - 15
Social Politicat	Council policy on telecommunications/views of LPA, PA or DOE PS in Northern Ireland, Level of influence of local key stakeholders and Non Governmental organisations, Involvement of MP, MPS, AM, planning authority or DOE PS and DRD in Northern Ireland, owned land and property.	0 - 10
Media	Likely media interest, regional/local media coverage, previous media interest, other sites that have raised the profile of the issue.	0 - 5

The Traffic Light model must be used to give an overall Rating for each proposed site. The Model combines elements of subjectivity and objectivity and is intended as a guide to the degree of consultation necessary. Once the Rating has been determined then the Consultation Strategy is used to provide the options available in respect of the level of public consultation. It is important to seek LPA/PA/DOE PS (Divisional Planning Office) input into the process. The rating for each site is to review at least once - in particular after pre application consultation.

Planning and Environmental issues

Sensitive land Use	Site in relation to residential property, homes and schools and other sensitive land uses such as nurseries, playgroups, playgrounds and hospitals.	0 - 15
Siting and Appearance	Siting - existence of topographical features and natural vegetation, flora and fauna, impact on skyline or horizon, townscape clutter, site in relation to existing masts, structures or buildings (including historical or traditional character), views of recognised importance.	0 - 10
Planning	Development Plan Policies including green belt designation, Precedents/Site History, impact on sites of special land use designation such as National Parks, AONB, Conservation Areas, SSSI, ASSI, Listed Buildings etc. See Guidelines for using the Traffic Light model for a more comprehensive list.	0 - 5

Guide to Using Traffic Light Rating Model for Public Consultation

The guide is to assist in ascertaining the amount and type of public consultation that is required for any proposed site. The public consultation that is carried out under this process will be in addition to that already carried out by the Planning Service for applications for planning permission.

The graph should be used to rate a site as green, amber or red. The Traffic light Model operates along two axis; "Planning and Environmental issues" (horizontal) and "Community issues" (vertical).

Planning and Environmental Issues – horizontal axis

The horizontal axis is used to ascertain planning and environmental issues relating to the proposed site. The axis is graded 0 – 30, where 0 indicates very low concern and 30 where there are likely to be major concerns to the proposal.

The grading along this axis is made up from three categories; Sensitive Land Use, Siting and Appearance and Planning. Each category identifies the key elements that will determine the level of consultation required. The categories have different levels of influence and have, therefore, been given different levels of weight.

The Sensitive Land Use category is graded from 0 – 15, the Siting and Appearance category from 0 – 10, and Planning from 0 – 5.

The highest score within each category will apply and not a cumulative score.

The person using the Traffic Light Model will use the tables below to determine the score in each of the categories. Some of the categories are objective (Sensitive Land Uses) whilst the others allow some form of subjectivity. A degree of common sense must be applied when giving a Site a Rating as there may be other reasons not mentioned in this Guide that will affect its sensitivity.

The horizontal axis rating is calculated by adding the score given in each of the categories on that axis.

Sensitive Land Uses 0 –15

Residential property or homes 0 –15

Location of site in relation to building	
Location on a residential tower block	10 - 15
Next to	10 - 15
In close proximity	5 - 10
Far from	0 - 5

Schools 0 - 15

Location of site in relation to boundary	
Located on	15
Next to	10 – 15
Close proximity	5 – 10
Near to	0 - 5
Far from	0

Nurseries, play groups, recreation grounds (with children's areas) 0 - 15

Location of site in relation to building	
Next to	10 – 15
In close proximity	5 – 10
Far from	0 - 5

Hospital Property 0 – 10

Buildings or grounds	
Located on	0 – 10
Elsewhere	0

Other sensitive land use to be treated on its own merits but could score 0 – 15

Siting and Appearance

This category is more subjective based on the factors set out in the box. A score must be given based on the implications of the issues in the category for that particular site.

Siting and Appearance 0 – 10

High Environmental Impact	*5* - 10
Low Environmental Impact	0 - *5*

Siting – matters to be considered include existence of topographical features and natural vegetation, flora and forna, impact on skyline or horizon, townscape clutter, site in relation to existing masts, structures and buildings (including historical or traditional character), views of recognized importance.

Design – matters to be considered include height in relation to surrounding area, appearance of the installation, material, colouration, dimensions (other than height), overall shape, solid or open framework, transmission solutions (i.e. impact of dish).

Site Type – new site, upgrade, swap out, mast share.

In respect of upgrades, swap outs, or mast shares it is anticipated that the score under siting an appearance will be less that for new installations. The matter that is being given consideration is the impact of the proposed alteration in comparison to the existing installation.

Planning 0 – 5

Development Plan policies (site specific) 0 - 5

Positive stance towards proposal	0
Neutral stance	0
Negative stance	*5*

Precedents/ Site history 0 - 5

Previous applications refused	*5*
No history of telecommunications proposed	0
Previous applications successful	0

Located within special land use 0 - 5

N. IRELAND	*5*
Green Belt land Within 50m of Conservation Area	0 - *5*

Location in relation to sensitive site 0 - 5

On a Listed Building	*5*
Within 50m of listed building	0 - *5*
Greater than 50m	0

Community Issues – vertical axis

The vertical axis is used to ascertain community issues. The axis is again graded 0 – 30, where 0 indicates low concern and 30 where there are likely to be major concerns to the proposal.

Media 0 – 5

Previous Media Interest **0 - 5**

Significant negative publicity	*5*
No interest	0

Does the rating feel right?

It is important to appreciate that a degree of common sense must be applied in determining a Rating for a particular site. Once the Rating has been given and it is not appropriate than a final review should be undertaken. The Rating can be amended but only if there are compelling reasons, in other words this health check should only be used on rare occasions. A full written justification must be given as to why the Rating was changed and may have to be reviewed as all sites are.

Annex F – Operator Enquiry Points

Each of the operators and infrastructure providers has a dedicated staff dealing with enquiries and complaints received by phone, by letter or as an e-mail. Commitment Eight of the Ten Commitments is to “provide specific staff resources to respond to complaints and enquiries about radio base stations within ten working days”. The operators are committed to ensuring that concerns from the public are dealt with properly.

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O2 UK
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www.o2.com

Orange
0800 783 5021
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www.orange.co.uk

T-Mobile UK Ltd
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Glossary

Antenna
A device which transmits and receives radio waves. There are different designs in operation including Omni-directional antennas, sectored antennas and dual/tri-band antennas.

Attenuation
Reduction in strength of a radio signal as a result of atmospheric absorption, obstruction by buildings etc.

Base Station
A fixed radio transmitter/receiver which electronically relays signals to and from handsets and other data terminals. Generally taken to include all the component of the development - the antenna, mast or supporting structure, equipment housing, cable runs, fencing, planting, landscaping, access, power supply and land lines.

Broadband Services
Services in which the bandwidth is sufficient to carry large volumes of data.

Code System Operator
An operator of a telecommunications system under schedule 3 of the Communications Act 2003, known as the ‘Electronic Communications Code.’

De Minimis
This term covers minor works which, in relative terms, may not have a material effect on the external appearance of the building or structure on which they are installed. As a result they may not come within the legal definition of development and hence not require planning permission. Where such minor works are proposed to a listed building, however, listed building consent may still be required.

Directional Antenna
Any antenna which picks up or radiates antenna signals better in one direction than another.

2G
2G, the second generation or GSM is the technology currently used in the operation of mobile phones.

3G
3G or third generation is the generic term used for the next generation of mobile communications systems. The new systems will enhance the services available today and will offer multimedia and internet access and the ability to view video footage. The third generation technology used in the UK is called UMTS. These services operate at 2200 MHz. (2.2GHz).

Analogue
First generation mobile phone technology which was phased out in the UK in 2001 with the introduction of second generation technology (GSM).

Cabin
A structure which protects transmitters and receivers from damage. They can be in the form of large cabins or smaller cabinets.

Cell
A geographic area of coverage that a radio base stations covers.

Feeder cable
The co-axial cable which connects an antenna to a base station transmitter or receiver.

Frequency
Frequency is the number of times per second at which an electromagnetic wave oscillates. It determines the wave's properties and usage. Frequencies are measured in hertz (Hz). 1 Hz is one oscillation per second, 1 kHz a thousand, 1 MHz is a million and 1GHz is a thousand million. Frequencies between 30 kHz and 300 GHz are widely used for telecommunication, including broadcast radio and television, and comprise the radio frequency band. Mobile telephone systems currently operate at 900MHz and 1800MHz.

GSM
GSM - Global System for Mobile Communications or Groupe Speciale Mobile is the international, pan-European operating standard for the current generation of digital cellular mobile communications. It enables mobile phones to be used across national boundaries. GSM systems are operated by mm02 and Vodafone at 900 and 1800 MHz, and by One2One and Orange at 1800MHz.

ICNIRP
The International Commission on Non-Ionizing Radiation Protection (ICNIRP) is an independent scientific body which has produced an international set of guidelines for public exposure to radio frequency waves, limiting the exposure of the general public to electromagnetic fields between 0HZ to 300HZ. These guidelines were recommended in the Stewart Report and adopted by the Government. The mobile network operators have accepted these guidelines and work within them.

Macrocell
A macrocell provides the largest area of coverage within a mobile network. The antennas for macrocells can be mounted on ground-based masts, rooftops or other existing structures. They must be positioned at a height that is not obstructed by terrain or buildings. Macrocells provide radio coverage over varying distances depending on the frequency used, the number of calls made and the physical terrain. Macrocell base stations have a typical power output in tens of watts.

Ground-Based Mast

A ground-based structure that supports antennas at a height where they can satisfactorily send and receive radio waves. A typical ground-based mast is 15m high, and of steel lattice or tubular steel construction. New slimmer versions of such masts are now available which can be painted to blend in with their surroundings, disguised as trees or used in conjunction with street lighting. Masts themselves play no part in the transmission of the radio waves.

Microcell

Microcells provide additional coverage and capacity where there are high numbers of users within urban and suburban macrocells. The antennas for microcells are mounted at street level, typically on the external walls of existing structures and on street furniture. Microcell antennas are usually smaller than macrocell antennas and when mounted on existing structures can often blend into building features. Microcells provide radio coverage over distances, typically between 100m to 1000m and operate at power evels substantially below those of macrocells.

NRPB

The National Radiological Protection Board (NRPB) has two main functions: to advance knowledge about the protection of mankind from radiation hazards and to provide information and advice to persons in the UK with responsibilities relating to protection from radiation hazards. The NRPB has produced a set of national guidelines for public exposure to Radio Frequency waves. These have the same scientific foundation as the ICNIRP guidelines.

Picocell

A picocell provides more localised coverage than a microcell. These are normally found inside buildings where coverage is poor or there are a high number of users such as airport terminals, train stations or shopping centres.

Roof-Based Mast

A roof-mounted structure which supports multiple antennas at a height where it can satisfactorily send and receive radio waves. Often in the form of a stub mast, it is typically 4m - 6m high and of steel lattice construction. Stub masts themselves play no part in the transmission of radio waves.

Transmitter

Electronic equipment that generates radio frequency electromagnetic energy and is connected to an antenna via a feeder cable.

Wavelength

Wavelength is the distance in metres between any two ‘similar’ points on a radio wave. This portion of the wave is referred to as one complete cycle. The lower the frequency of a wave the longer the wavelength.