



# HILLINGDON

LONDON

## Working Group to Review the Council's Policy on Major Telecommunications Equipment on Council Property

April 2007

### Members of the Working Group:

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Cllr Kay Willmott-Denbeigh



INVESTOR IN PEOPLE

## **Summary of Recommendations**

This working group has sought to review the Council's moratorium on the siting of major telecommunications equipment on Council property. Following a thorough review of the issues – including the latest health research – we suggest that the Council adopts a flexible policy that ensures the Council has maximum possible control over the siting of such equipment. We are not suggesting that all mobile phone masts be installed on Council owned land, but we believe that there may be **some** occasions when Council owned land provides the best outcome for both residents and mobile phone operators.

In short, we recommend:

- 1. That the moratorium is lifted and replaced with a more flexible policy that allows telecommunications equipment to be installed on Council owned property, land and buildings subject to each site being considered on an individual basis. We propose Cabinet asks officers to devise a suitable process for dealing with applications that ensures elected Members consider each site.**
- 2. That Cabinet asks officers to ensure suitable measures are put in place to publicise the change in Council policy and the reasons for this change. We suggest that this is likely to include an article in *Hillingdon People*, a press release, and leaflets to residents' associations.**
- 3. That Cabinet asks officers to ensure that there is an early and open dialogue between the operators, local authority and public about mobile operators' plans for network expansion, including an annual meeting with residents' and tenants' associations, community groups, and local residents to discuss the annual rollout plan. In addition, we ask that the information available to both elected Members and the public be improved. Specifically, we recommend that the annual rollout plans, which include a register of all mobile phone masts, are published on the Council's website (as with some other Councils).**
- 4. That a suitable body of Councillors (e.g. the Residents' and Environmental Services Policy Overview Committee) reviews the impact of the Council's revised policy in between one and two years' time, including the latest health evidence, unless there is material new evidence that warrants an earlier review.**

# **Working Group to Review the Council’s Policy on Major Telecommunications Equipment on Council Property**

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## Chairman's Foreword



As a committed ward councillor I know that applications for mobile phone masts are often highly controversial and emotionally charged. This represents a paradox in that a huge number of people own and use mobile phones, yet many of these users vigorously oppose attempts to site the base stations near their home.

Much of the opposition to mobile phone masts stems from concern over the health impact of such equipment. This reflects the uncertainty that always surrounds new technology. In reviewing this moratorium we have sought to cut through media 'scare stories' and understand the scientific research on this issue. In particular, we found the advice from the Health Protection Agency highly reassuring and I believe that this advice fully justifies reconsideration of the moratorium.

It is vital that Councillors, people elected to represent the interests of local residents, have as much control as possible over the siting of mobile phone masts in the Borough. Unfortunately central Government planning policy means that the planning process provides Councillors with limited control over masts on private land. We therefore believe that a more flexible policy that allows masts on Council land will actually provide the Council with more control over the siting of such equipment and enable a more constructive dialogue with the mobile phone operators. We are not saying that all mobile phone masts on should be placed on Council land, but believe that in **some circumstances** Council land may present the best option for both local residents and the mobile phone operators. However, it is vital that the Council remains sensitive to the interests of local communities.

Finally, on behalf of the Working Group I would like to thank all those who gave up their time to attend our meetings to give evidence, and the officers from various Council departments who supported this review. I believe that this review represents an excellent example of how Policy Overview can consider the views of a range of stakeholders and advise Cabinet on potentially contentious issues. Without the help of our witnesses and supporting officers, this excellent review could not have taken place.

*Andrew*

Cllr Andrew Retter

## **INTRODUCTION**

1. The Council has operated a moratorium on the siting of major telecommunications equipment on its property since the late 1990s. This arose following a decision taken by the former Policy Committee in October 1998 that no telecommunications masts could be placed on Council land 'until clarification of the possible health hazards has been received'.
2. On 15<sup>th</sup> September 2005 Council agreed a motion asking Overview & Scrutiny to re-examine this policy in light of the increased demand for mobile phone technology. The Residents' & Environmental Services Policy Overview Committee established a Working Group to examine the Council's policy, in particular whether the moratorium should continue.
3. This review is both timely and important given that the technology has changed hugely in this time and a large amount of scientific research has been undertaken into the health implications of such equipment. In addition, the review enables the Council to balance its community leadership responsibilities for health protection with its responsibilities to encourage economic wellbeing, economic regeneration and inward investment.
4. The terms of reference for this review were:
  - To review the Council's current policy in relation to the siting of major mobile telecommunications and data services equipment.
  - To take account of technological and services developments, as well as the latest health protection knowledge, in relation to this equipment, and recommend any appropriate updating in our policy.
  - To ensure that the Council maximises its influence over the siting of such equipment to the benefit of residents, businesses and partners.
5. In short, we sought to undertake a well-informed review that enabled us to make recommendations to Cabinet on the Council's policy on the siting of major telecommunications equipment on Council property.
6. This report presents our findings from this review. We first outline our methodology and then present a summary of the main issues. Our conclusions and recommendations follow this evidence.

## METHODOLOGY

7. We began the review by examining some of the key background documents on this issue. These included fact sheets from the World Health Organisation and the Mobile Operators Association; the Stewart Report produced by the Independent Expert Group on Mobile Phones (IEGMP) in 2001, and the Government's response to this report.
8. The majority of the evidence for the review was gathered through three witness sessions. We heard from the following diverse range of stakeholders:

<b>Date of meeting</b>	<b>Witness</b>	<b>Organisation</b>
7 <sup>th</sup> November 2006	Ray Taylor	BT Wholesale
	John Collins	BT
13 <sup>th</sup> December 2006	Nicola Davies	Mobile Operators Association
	Nicola Whitehead	Vodafone
	Rebecca D'Arcy	Orange
	Gordon Simmons	T-Mobile
	Jim Stevenson	O2
	Cllr Catherine Dann	Hillingdon Council
	Cllr Norman Nunn-Price	Hillingdon Council
15 <sup>th</sup> February 2007	Cllr Jill Rhodes	Hillingdon Council
	Dr Michael Clark	Health Protection Agency
	Frank Freeman	Metropolitan Police

9. We used our February meeting to seek the views of local residents on the moratorium. Eastcote Residents Association had already expressed an interest in this issue and representatives were invited to the meeting. In addition, residents were invited to the meeting through articles on the Council's website and in the local press. Members of the public were invited to address our February meeting and we were pleased to hear people's views on this issue.
10. Throughout the review the Working Group received advice from Steve Palmer (Hillingdon Council's Head of ICT) and Tim Jurdon (Hillingdon Council's Aviation Team Manager). Pat Holmes (Hillingdon Council's Estates Manager) advised us on the property issues relating to leases.

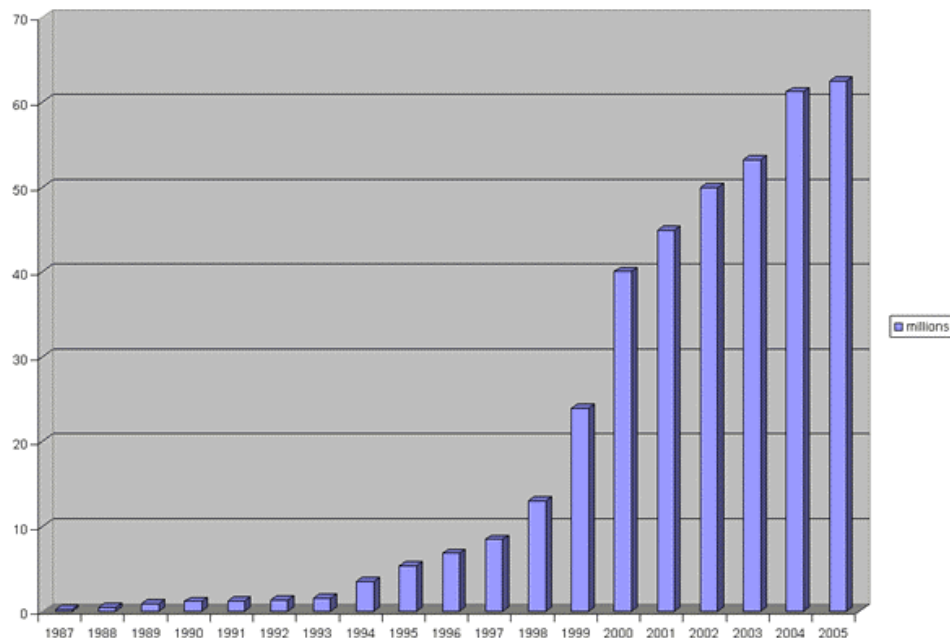
## **FINDINGS & EVIDENCE**

### **What are mobile phone masts and why are they required?**

#### **Increase in demand**

11. Mobile phones have been available for over twenty years, but the last ten years has seen a massive increase in the number in use in the UK. Ofcom statistics report that there are over 65 million mobile phone subscriptions in the UK, with nearly a third of all UK phone calls being made on a mobile phone. Between December 1999 and December 2000 46,000 new users joined the UK mobile phone network every day.<sup>1</sup> The chart below indicates this massive increase in demand for mobile telephones since the moratorium was put in place.

*Figure 1: Number of mobile phone subscribers in UK: 1987 to 2005*



(Source: Mobile Operators Association<sup>2</sup>)

#### **How mobile phones work**

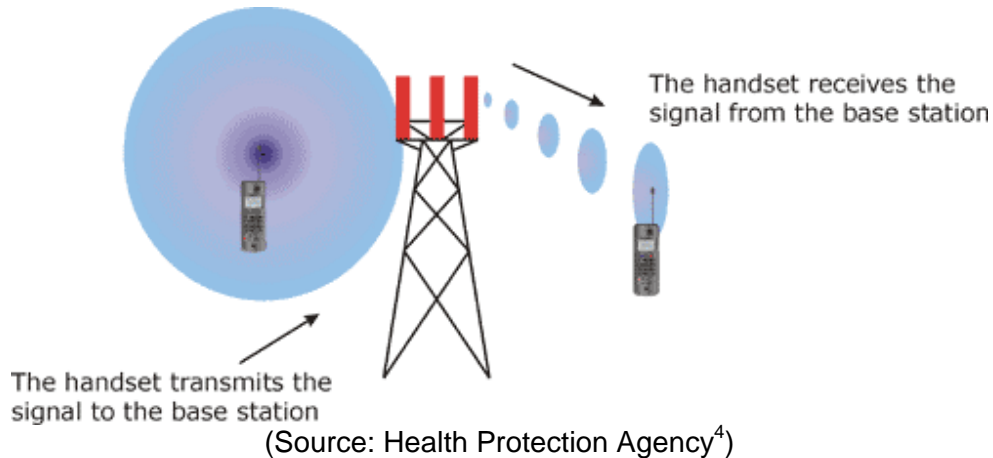
12. Mobile phones rely on communication between two pieces of equipment – the handset and the base station. The mobile phone handset transmits radio waves that carry the voice of the phone user to the base station, while the base station transmits radio waves to the mobile phone and these carry the voice of the person the phone user is listening to. The base station passes the signals to and from the phone

<sup>1</sup> <http://www.mobilemastinfo.com/information/history.htm>

<sup>2</sup> <http://www.mobilemastinfo.com/information/history.htm>

network.<sup>3</sup> Mobile phones do not work without base stations (often referred to as masts). Without base stations mobile phone calls cannot be made and base stations must therefore be located where people use their phones.

Figure 2: How a mobile phone works



13. In order to meet customer demand across the Country, the five mobile phone operators divide the UK into thousands of 'cells' with a base station at the centre. Cells overlap at the edges to prevent holes or gaps in coverage. If cells are too far apart then calls cannot continue as the user moves location. For example, a passenger in a car using a mobile phone will have their call transferred between several base stations as they move along their journey. The call will be cut off or 'dropped' if there is gap in the cell coverage.
14. Cell sizes vary depending on the location and type of mast. The radio signals can only travel a certain distance before they become too weak to be received. In addition, the local terrain or landscape can increase the need for mobile phone masts and limit the size of the cell: trees, hills or buildings may all block the signal and mean more masts are required, for example.
15. Significantly, base stations can only handle a certain number of calls at any one time. Extra transmitters can be added to a base station to increase capacity, but there is a limit to the number of the number of transmitters that can be placed on a base station. A greater number of mobile phone calls are made in urban areas such as a London Borough and therefore a greater concentration of masts is required in such areas to meet this demand.
16. Cell sizes can therefore vary greatly depending on where they are located. Base stations can be as close as 200-500m in towns and 2-5km apart in rural areas.

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<sup>3</sup> [http://www.hpa.org.uk/radiation/understand/information\\_sheets/mobile\\_telephony/background\\_info.htm](http://www.hpa.org.uk/radiation/understand/information_sheets/mobile_telephony/background_info.htm)

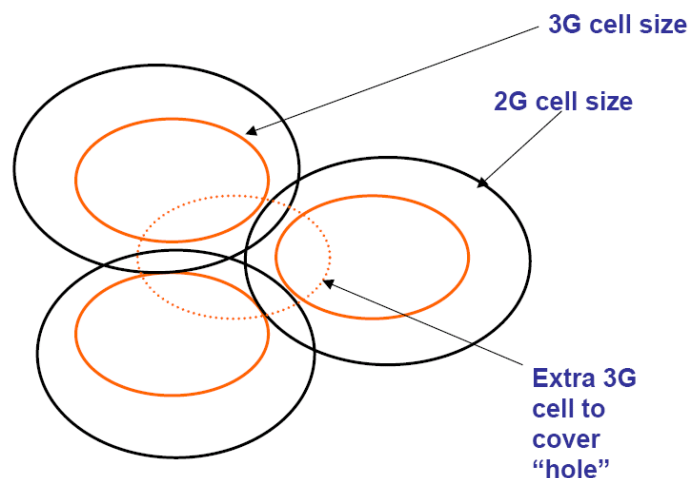
<sup>4</sup> [http://www.hpa.org.uk/radiation/understand/information\\_sheets/mobile\\_telephony/background\\_info.htm](http://www.hpa.org.uk/radiation/understand/information_sheets/mobile_telephony/background_info.htm)



### Third generation or '3G' technology

17. Not only is the number of calls being made on mobile phones increasing, but mobile phones are also being used for an ever greater array of services. Traditional voice calls were handled on what was known as second generation or '2G' technology. However, in 2000 five companies gained a licence to provide third generation or '3G' services. 3G technology enables phones to provide a wider array of services including video calling and faster access to email and the internet. These operators are obliged by their licences to provide 3G services to at least 80 per cent of the population 31<sup>st</sup> December 2007.
18. Radio waves for delivering 3G services are transmitted at a slightly higher frequency than for 2G. They therefore travel a shorter distance and the coverage area or cell size for a 3G base station is smaller than for a 2G site. Operators seeking to provide 3G coverage will first attempt to upgrade existing 2G sites, however the diagram below shows that additional 3G masts may be required to infill the 'gaps'.

*Figure 3: Expanding the network for 3G coverage*



(Source: Mobile Operators Association)

### Different types of masts

19. When thinking of mobile phone masts most people picture a large structure, often attached to a freestanding steel lattice tower. These are 'macrocells' and provide the main infrastructure for a mobile phone network. As such, they must be located at a sufficient height to enable clear coverage over the surrounding area.
20. However, we heard that operators are increasingly seeking to minimise the visual impact of these large transmitters. The pictures below illustrate three diverse examples of macrocell antennae.

Figure 4: Three different macrocell transmitters



(Source: Health Protection Agency<sup>5</sup>)

21. As outlined above, operators increasingly need to install additional base stations to meet the extra demand for mobile phone calls and the smaller cell size of the 3G network. These masts are called ‘microcells’ or ‘picocells’. Microcells are typically mounted at street level, such as on the walls of buildings or lampposts. They are much smaller than the macrocells pictured above and can often be disguised as building features. The next picture demonstrates a microcell mounted on the wall of the *Metropolitan Pub* in Uxbridge.

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<sup>5</sup> [http://www.hpa.org.uk/radiation/understand/information\\_sheets/mobile\\_telephony/base\\_stations.htm](http://www.hpa.org.uk/radiation/understand/information_sheets/mobile_telephony/base_stations.htm)

Figure 5: Wall mounted microcell in Uxbridge



22. Picocells provide even more localised coverage than a microcell and are normally found inside buildings where coverage is poor or where there are a high number of users such as airport terminals and shopping centres.

#### **Microconnect Distributed Antennas (MDA)**

23. Additional mobile phone base stations are therefore required to meet increased demand and the smaller coverage of 3G technology transmitters. Witnesses from BT outlined a new product being developed to meet this additional demand in urban areas. The Microconnect Distributed Antennas (MDA) system can be used by all five UK networks and seeks to complement existing base stations by adding extra capacity in areas with high mobile phone usage. Each antenna is approximately 30 cm in length, sits vertically on top of street furniture such as streetlights, and covers an area roughly comprising a 100m radius. BT has installed the MDA system in Cardiff and Westminster in conjunction with the local authority. The photos below illustrate an example of a Microconnect Distributed Antenna: we suggest that it would be hard to identify an antenna without prior knowledge.

Figure 6: Example of a Microconnect Distributed Antenna mounted on a streetlight



(Source: BT)

**KEY POINTS:**

- Mobile phone masts can only handle a certain number of calls over a set geographical area.
- Extra masts are required to meet increased demand and the new third generation technology.
- More people make mobile phone calls in urban area and therefore more masts are needed in London Boroughs compared to rural areas.
- The size and design of masts varies greatly. Companies have developed far less intrusive base stations that can meet extra demand in urban areas.

**What is known about the health impact of telecommunications equipment?**

24. The Council's current policy reflects the public health concerns that surrounded mobile phone technology in the 1990s. Councillors at that time were clearly acting to protect their residents and sensibly decided that a precautionary approach should be taken until more was known about the health implications of this rapidly spreading technology.
25. As figure 1 earlier shows, the number of people using mobile phones has massively increased in the last five years. In this time, over 30 scientific reviews have been

undertaken to establish the health impact of mobile telecommunication equipment.<sup>6</sup> We were unable to study all of these reports, so we focused on a selection of high profile reports that have been produced by what we believe to be the most impartial organisations. In addition we were fortunate that Dr Michael Clark from the Health Protection Agency was able to attend our February meeting.

### **The Stewart Report**

26. In April 1999 the then Minister for Public Health Tessa Jowell announced that she had requested the Chairman of the National Radiological Protection Board (NRPB) to set up an Independent Expert Group on Mobile Phones (IEGMP). The Group published its report in May 2000 and is known as the Stewart Report after its Chairman Sir William Stewart. The full report can be found at [www.iegmp.org.uk](http://www.iegmp.org.uk).
27. We feel two findings are particularly important to note: firstly that the exposure from mobile phone masts is far less than that from mobile phones themselves, and secondly that there is no evidence that there are negative health affects from these low levels of radiation:

*'for the general population, the levels of exposure arising from phones held near the head or other parts of the body are substantially greater than the whole-body exposures arising from base stations.'* (para. 1.3)

*'The balance of evidence to date suggests that exposures to RF (radiofrequency) radiation below NRPB and ICNIRP guidelines do not cause adverse health effects to the general population.'* (para 1.17)

### **The World Health Organisation (WHO)**

28. The World Health Organisation is the United Nations specialised agency for health. It was established in 1948 and is governed by the 193 Member States through the World Health Assembly. Its objective, as set out in its Constitution, is the 'attainment by all peoples of the highest possible level of health'. As such, we were interested to hear the view of this organisation on the health impacts of mobile telecommunications equipment.
29. The World Health Organisation published a fact sheet on this issue in May 2006. This reported that:

*'Considering the very low exposure levels and research results collected to date, there is no scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects'*<sup>7</sup>

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<sup>6</sup> Source: Mobile Operators Association

<sup>7</sup> <http://www.who.int/mediacentre/factsheets/fs304/en/index.html>

30. The fact sheet noted that the public are often concerned about the impact of mobile phones on public health, including an increase in body temperature. However, it concludes that:

*'The levels of RF exposure from base stations and wireless networks are so low that the temperature increases are insignificant and do not affect human health'.<sup>8</sup>*

### **The Health Protection Agency**

31. The Health Protection Agency (HPA) is a non-departmental public body that is funded by the Department of Health but is independent from government and the mobile phone industry. Dr Michael Clark gave us a highly informative presentation and we were pleased to hear his reassurance on this issue. In particular, we note the paradox that exposure levels from mobile phones held next to the head are typically 10,000 times higher than from a mobile phone mast.
32. We were concerned to hear from residents that research in Holland and Israel contradicts the scientific consensus on this issue. Dr Clark informed us that in any scientific field there will always be a very small minority of scientists who disagree with the mainstream position. Significantly, he told us that there are major limitations with these studies such as the size of the survey and the failure to take account of other factors that may affect health. Additionally, scientists at the University of Zurich replicated the Dutch study but did not find an impact from mobile phone signals, which suggests that the results were potentially flawed.

### **Guidelines to protect exposure from radio waves**

33. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) is an independent international scientific organisation formally recognised by the World Health Organisation. ICNIRP reviews the science relating to exposure to electromagnetic fields and produces guidelines for limiting people's exposure. The Stewart Report recommended that the ICNIRP guidelines for public exposure be adopted for use in the UK and stated that there is no evidence of adverse health effects from exposure below these guidelines.<sup>9</sup> Numerous surveys measuring the level of emissions from base stations against these guidelines have taken place and these are discussed below.

### **Emission surveys from mobile phone masts**

34. The Health Protection Agency's website reports the results of a number of emissions surveys that have been undertaken in the vicinity of several mobile phone base stations near schools, homes, hospitals, offices and other buildings. Measurements were taken at over 115 locations and found that exposures were usually small fractions of the ICNIRP guidelines. The highest measured public exposure from all

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<sup>8</sup> <http://www.who.int/mediacentre/factsheets/fs304/en/index.html>

<sup>9</sup> [http://www.hpa.org.uk/radiation/understand/information\\_sheets/mobile\\_telephony/health\\_advice.htm](http://www.hpa.org.uk/radiation/understand/information_sheets/mobile_telephony/health_advice.htm)



sources of radiofrequency signals (including TV and radio transmitters) combined was 0.2% of these guidelines, whilst typical average exposure levels were 0.002% of the guidelines. Significantly, the results did not show any particular decrease in the exposure as the distance increases from the mast.<sup>10</sup> The World Health Organisation report that surveys have shown that exposures from base stations range from 0.002% to 2% of the levels of the international exposure guidelines.<sup>11</sup> O2 paid for an independent expert to survey a site of the Working Group's choosing. The full results are attached in appendix 3 and we were pleased to see emissions are a tiny fraction of guidelines.

35. Any technology, including mobile telecommunications, can be confusing to non-specialists and we generally sought to avoid complex specifications and technical data. However, we did note with interest the low power outputs of mobile phone masts. The Health Protection Agency advise that the output from a large macrocell base station with ten 10W transmitters will vary between a minimum of 10W and a maximum of 100W over time. It is important to note that these are the largest mobile phone masts that are usually placed in rural areas or on tall buildings in urban areas at a significant distance from the public.
36. We outlined earlier the smaller base stations that are increasingly being used to fill gaps in coverage, typically in urban areas. Given the much smaller size of such equipment (with dimensions similar to a burglar alarm box), it is perhaps not surprising that the power output and emissions of such equipment is even lower than for the large macrocells. We heard from BT that the maximum wattage of an individual Microconnect Distributed Antenna is 7W, although typical wattage is 1-4W, and that 7W is roughly equivalent to 3.5 mobile phones. It is therefore important to note that a small mobile phone mast such as this, which could potentially be installed at the top of a lamppost, has a similar power level to one or two mobile phones, and that a mobile phone would be in much closer proximity to a person. In contrast, Dr Clark told us that the television transmitter at Crystal Palace, south London, has an output of 10 million watts.

### **An 'electromagnetic smog'**

37. We particularly note that not only are emissions from mobile phone masts far below international guidelines, but that the public are likely to be subject to far greater levels of emissions from other technology.
38. This review was launched in response to a Council motion proposed by Cllr Norman Nunn-Price. We were therefore pleased to listen to his views on this issue and were particularly struck by his comment that modern society exists in an 'electromagnetic smog', with mobile phone base stations being just one source of radiofrequency (RF) emissions.

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<sup>10</sup> [http://www.hpa.org.uk/hpa/news/nrpb\\_archive/press\\_releases/2000/press\\_release\\_6\\_00.htm](http://www.hpa.org.uk/hpa/news/nrpb_archive/press_releases/2000/press_release_6_00.htm)

<sup>11</sup> <http://www.who.int/mediacentre/factsheets/fs304/en/index.html>

39. We feel it is important to note research that shows that due to the lower frequency of FM radio and television waves, the body absorbs up to five times more of the signal from such transmissions than from mobile phone base stations. Significantly, radio and television broadcast stations have been in operation for over fifty years without any adverse health consequences being established.<sup>12</sup> Dr Clark told us that studies have been undertaken over several decades focusing on those working in the television and radio industry. These have provided no consistent or convincing evidence of a casual relationship between RF exposure and any adverse health effect.
40. We note that many people expressed concerns about television and radio antennae when these first started to emerge over fifty years ago, often due to health fears over 'new' technology. However, it would now be very rare to hear health concerns over television aerials and people have grown accustomed to this technology.

### **Very young children**

41. Members of the public who addressed our review expressed particular concern about the siting of mobile phone masts near schools. Dr Clark advised told us that less information is available about the impact of mobile phone technology on young children for it is much harder to gather research relating to this section of society. He therefore suggested that it may be sensible to adopt a more precautionary approach in relation to primary schools, although this would make less sense for secondary schools given that most pupils own mobile phones from which exposure is much higher. It is also important to note that distance does not always relate to exposure levels. A mast located nearer a school may actually give less exposure to pupils than one further away for the signal may be deflected by buildings and the physical environment. Again however, we stress the importance of being sensitive to people's concerns.

#### **KEY POINTS:**

- A wide range of surveys indicate that emissions from mobile phone base stations are a tiny fraction of international guidelines.
- Numerous scientific studies have been unable to identify any adverse health impacts from the emissions from mobile phone base stations if these are below international guidelines.
- The body absorbs more emissions from mobile phone handsets and from television and radio transmissions than mobile phone base stations.

### **Mobile phone masts and the planning process**

#### **Existing mobile phone base stations in Hillingdon**

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<sup>12</sup> <http://www.who.int/mediacentre/factsheets/fs304/en/index.html> & [http://www.hpa.org.uk/hpa/news/nrpb\\_archive/press\\_releases/2000/press\\_release\\_6\\_00.htm](http://www.hpa.org.uk/hpa/news/nrpb_archive/press_releases/2000/press_release_6_00.htm)



42. At the end of 2006 there were over 330 mobile phone base stations within Hillingdon. Many of these are mast or site shares with several operators combined at one site. The greatest concentration of mobile phone base stations is at Heathrow Airport where the majority are sited on existing airport buildings.

*Figure 7: Existing mobile phone base stations in Hillingdon*

OPERATOR	EXISTING INSTALLATIONS	APPROVAL GRANTED BUT NOT BUILT	TOTAL
3	36	3	39
O2	75	4	79
T-Mobile	64	7	71
Vodafone	72	1	73
Orange	57	14	71
TOTAL	304	29	333

### Planning regulations

43. Given the moratorium, the only control the Council has over the siting of mobile phone masts is through its role as the local planning authority. However, we heard that the planning process varies according to the size of the mast that is being proposed and planning permission is only required for the largest type of masts.

*Figure 8: Planning regulations and different mobile phone base stations*

**Not Development:** Certain small works such as microcells the size of burglar alarms are either classed as 'de minimus' or as 'not affecting the external appearance of the building' and therefore do not involve development and can proceed without approval. Under the terms of the Electronic Communications Code, operators are required to notify the Council of their intention to carry out such works in some instances. No pre-application discussions or formal consultation is involved.

**Permitted Development:** Minor works, such as alterations to existing masts, the erection of additional antennae, and some new base stations on certain buildings, are classified as 'permitted development' and do not require planning permission or 'prior approval'. However, under the terms of the Electronic Communications Code, operators are required to notify the Council of their intention to carry out such works in some instances. No pre-application discussions or formal consultation is involved.

**Prior Approval:** The majority of ground-based masts below 15m and many rooftop installations are classified as permitted development but require 'prior approval' from the Council for details of their siting and design. In such cases, the Council must issue a formal decision within 56 days or the application is deemed to have been approved. Informal pre-application consultation should be carried out by the operators under the

'traffic light model'.<sup>13</sup> Formal consultation in accordance with the Council's adopted procedure must also be undertaken. This involves a site notice and neighbour notification letters and also schools within a 500m radius.

**Full Planning Permission:** Ground-based masts over 15m, larger rooftop installations and applications within conservation areas require full planning permission. The same level of consultation outlined above takes place.

### **The national planning policy context: PPG8**

44. National policy is outlined in the Government's Planning Policy Guidance Note 8 (PPG8) dated August 2001. The Council's planning officers advised us that this policy is generally positive towards the provision of nationwide mobile phone networks whilst minimising the visual impact of any installation.
45. PPG8 clearly outlines the Government's view in relation to public health concerns and mobile telecommunications equipment:
- '...it is the Government's firm view that the planning system is not the place for determining health safeguards. It remains central Government's responsibility to decide what measures are necessary to protect public health. In the Government's view, if a proposed mobile phone base station meets the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines for public exposure it should not be necessary for a local planning authority, in processing an application for planning permission or prior approval to consider further the health aspects and concerns about them.'* (para. 30)
46. In short, the Government's firm position is that it is not for local authorities to form conclusions over health implications of telecommunications equipment. In certain circumstances residents' general anxiety about the perceived health impact may contribute to a general loss of amenity. However, the weighting that can be attached to such perceived impacts can only be extremely limited.

### **The planning process at Hillingdon**

47. Each autumn the five mobile phone network operators provide all local planning authorities with annual rollout plans for their area that indicate search areas where new installations are required. This information includes:
- A schedule identifying existing sites with site name and reference number, address, grid reference and status.
  - Approximate locations of proposed sites for the year ahead within the Borough.
  - A single point of contact to co-ordinate discussions.

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<sup>13</sup> An evaluation system for assessing the sensitivity of any installation and used to ascertain the amount and type of public consultation that is required for any proposed site.

48. Local authorities can arrange a rollout meeting either with individual operators or jointly with all operators to discuss this annual rollout plan. Hillingdon always takes up this offer and holds a joint meeting with the five operators to share information and encourage appropriate site and mast sharing between the operators to seek to limit overall environmental impacts.
49. Operators are required to submit a comprehensive range of documentation with an application for planning permission or prior approval. This must include site layout and location plans, a certificate of compliance with ICNIRP guidelines, and supplementary information demonstrating that there has been a full and proper search for sites, including justification for rejecting alternative sites. Operators are also recommended to carry out pre-application consultation in accordance with the traffic light model rating.
50. We heard that on receipt of an application for prior approval or full planning consent, Hillingdon Council undertakes the following process:
- The application will be listed in the weekly list of applications
  - The Council will consult the Chairman of Governors and head teacher of any school within 500m of the application site;
  - A site notice will be displayed;
  - In certain circumstances, such as applications within conservation areas, the Council will advertise in the local press.

All telecommunications applications in Hillingdon are reported to the planning committees for determination.

51. In 2005 Hillingdon Council received approximately 50 applications for planning permission or prior approval for mobile phone base stations. The 2006/7 rollout plans show the operators are seeking over 100 sites:

*Figure 9: New base stations sought in Hillingdon for 2006/7*

<b>OPERATOR</b>	<b>SITES SOUGHT</b>
3	8
O2	10
T-Mobile	27
Vodafone	15
Orange	42
<b>TOTAL</b>	<b>102</b>

52. In Hillingdon the proportion of telecommunications base stations permitted varies over time but is currently running at around 70%. However, most refusals are appealed via the written representations appeal procedure and inspectors are

currently allowing approximately 50% of these appeals. We heard that it is difficult for refusals to be upheld on appeal unless there is an alternative site that can be suggested by the local planning authority that is more appropriate, or there are overwhelming and clear-cut planning objections. As stated earlier, current applications are increasingly for 3G base stations that have smaller coverage areas than the preceding second generation technology. As such, operators often have relatively small search areas within which new base stations can operationally be sited.

53. Finally, on a national basis, we heard that local authorities refusing applications on health grounds are consistently having their decisions overturned on appeal and are increasingly having to pay costs on the basis of unreasonable behaviour (i.e. there is no compelling scientific evidence of any harm and Government health advice is unambiguous).

**KEY POINTS:**

- Full planning permission is only required for the largest mobile phone base stations.
- Government policy does not allow health considerations to play a significant role in deciding planning applications for such equipment.
- Operators must demonstrate why a particular site has been chosen for a new base station. The smaller coverage area of a 3G base station may mean that there is a relatively narrow search area.
- Hillingdon Council has limited scope for refusing applications for mobile phone masts.

## **CONCLUSIONS**

54. This review sought to examine the Council's moratorium on the siting of major telecommunications equipment on Council land. The decision itself stated that the moratorium should stand 'until clarification of the possible health hazards has been received'. We, as elected representatives, take our responsibility to safeguard the health of Hillingdon residents very seriously, and have sought much information about the health impact of telecommunications equipment. The main findings on this issue are presented above and we believe that sufficient reassurance is now available to enable the Council to reconsider the moratorium.
55. The moratorium is designed to protect Hillingdon residents, however we heard that the rigidity of the moratorium can actually result in worse outcomes for local people.
56. The Council is by far the largest landowner in Hillingdon, with significant areas of open space and woodland in its portfolio. Witnesses from the mobile phone industry told us that they would be extremely interested in being able to locate base stations on Council property and believe that this could benefit both those seeking to use mobile phones and those who oppose the visual intrusion of mobile phone masts. In addition, the blanket ban of the moratorium does not distinguish between the varying nature of telecommunications equipment, which ranges from small antennae such as BT's MDA on top of lamp posts to larger masts that could be hidden amongst Council woodland. It also covers other (far lower powered) telecommunications equipment that does not form part of the mobile phone networks.

### **A lack of control**

57. A more flexible policy should give the Council more control over the location of mobile phone base stations and we believe it will lead to better outcomes for Hillingdon residents. The planning process only offers the Council limited influence over the siting of such equipment, and many refusals are overturned on appeal. However, allowing such equipment to be installed on selected suitable Council owned land would offer the Council much greater control over the location and design of the mast. In contrast to the limited powers available through the planning process when the proposed mast is on non-Council property, the Council would be able to modify the design and ultimately veto any proposed mast on Council land.
58. There are clear examples where the rigid moratorium has led to masts being installed in unpopular locations when Council land could have been used and would have been preferable to local residents. We particularly note the recent example brought to our attention by Cllr Catherine Dann and Eastcote Residents Association of how the moratorium can actually lead to worse outcomes for local residents.
59. In this instance, O2 applied for permission to site a mast on the junction of Eastcote High Road and Field End Road in the north of the Borough. The Council refused

planning permission but this was overturned on appeal by the government planning inspector. The mast is located on the pavement and we heard that local residents feel it is both an obstruction and visually intrusive within the Eastcote Village Conservation Area. However, there is Council land immediately behind the mast – Forge Green – which would have been far more acceptable for local residents, for the lower part of the mast would have been disguised amongst the trees and shrubs. Importantly, the site would have met O2's technical requirements. However the moratorium prevented this site being used resulting in the mast ultimately being displaced into a more intrusive location.

60. The more sites that are available for consideration by the mobile operator the more likely it is that a site acceptable to both the mobile operators and community can be found. The blanket ban in the moratorium reduces the number of potential sites for mobile operators and as stated above, this can lead to less acceptable outcomes for the community.
61. We also heard that the moratorium can increase the number of mobile phone masts that may need to be located in Hillingdon. Third generation mobile phone masts operate at a higher frequency and cover a smaller area than earlier equipment. Our witnesses told us that two or three masts might be required to cover an area which one well-placed mast on a Council property could service.

### **Not just mobile phone masts**

62. The moratorium was originally intended to relate to large mobile phone masts. However, officers from several service departments in the Council told us that the moratorium does not just affect mobile phone masts, but also other telecommunications equipment that could potentially improve the services offered to local residents.
63. One such example is wireless CCTV. Many other London Boroughs have been able to utilise wireless CCTV cameras which can be moved around to address local crime 'hot spots' that may emerge but are not covered by fixed cameras. We are concerned that technology has rapidly changed since the moratorium was agreed and a well intentioned policy may actually be undermining the Council and our partners' attempts to promote community safety. We believe this provides further justification for re-examining the moratorium, and suggests a rigid policy may not be in the best interests of our residents.

### **A more flexible policy but with close regulation**

64. It was suggested that the Council replace the moratorium with a policy that allows telecommunications equipment on Council land but not within 100m of a habitable room. We considered the arguments for such a policy, but decided that one rigid policy should not replace another rigid policy. The suggested policy may not address the problems outlined above where a mast is located in a sub-optimal location when



Council land for a more acceptably located mast is available. In addition, such a policy could also heighten public anxiety by sending a confused signal over the health implications of such equipment. It would suggest that this equipment is only safe at distances of at least 100m. However, the health evidence outlined above suggests that exposure levels are a tiny fraction of international guidelines at much closer distances. There are technical reasons why such a guideline distance would not present the best option. Third generation masts cover a smaller area than their second generation predecessors and witnesses from the mobile operators advised us that they would not be able to provide adequate coverage to an urban Borough such as Hillingdon if masts had to be a minimum of 100m away from habitable rooms. Finally, there is not always a direct relationship between exposure levels and distance from a mast. Signal strength may be stronger between for example 200m to 300m away from a mast when compared to that at 100m. Also, signals 'bounce' off buildings and the physical landscape further complicating exposure levels.

65. We therefore suggest that the moratorium is replaced with a more flexible policy that allows telecommunications equipment to be installed on Council land. We feel that this policy must be flexible and allow each application to be considered on an individual basis taking into account the specific location and the proposed equipment (e.g. whether this is a large macrocell for a mobile phone network or antennae for a wireless CCTV system). **We acknowledge that this is a controversial issue and believe that each individual proposal must be decided by elected Councillors after consultation with local residents.**
66. We were charged with reviewing the evidence to recommend whether the moratorium should continue. As such we do not advise on the exact process for implementing the revised policy, but suggest that Cabinet asks officers to develop further detail on this. It is vital that a revised policy gives control to the Council, and in particular elected Councillors. Major telecommunications equipment requires planning approval, and Councillors will therefore approve such equipment through the planning committee. However, we mentioned earlier that equipment is getting smaller and not all telecommunications equipment will require planning permission. It is therefore important that a process is devised for ensuring that Councillors, or a senior Councillor, approve the smaller installations that will not be scrutinised through the planning committees.
67. If a more flexible policy is adopted it is also important to clarify the process surrounding leases and property law. We note that under the current constitution leases for telecommunications equipment are likely to be agreed by a Cabinet Member given their likely length and/or value. However, following the evidence from the Council's Estates Manager we strongly suggest that Cabinet ensures the legal right of the Council to terminate leases is clarified. **The Council may not wish to relax the moratorium if it does not possess the ability to terminate any potential lease.**

68. We were advised that there would be a financial benefit for the Council in terms of rental income received from operators siting their telecommunications equipment on Council land or property. However, we did not feel that this was a significant issue that should influence the outcome of our review. Accordingly we have not given weight to any financial benefits that may accrue from relaxation of the moratorium.

**Recommendation 1:**

**That the moratorium is lifted and replaced with a more flexible policy that allows telecommunications equipment to be installed on Council owned property, land and buildings subject to each site being considered on an individual basis. We propose Cabinet asks officers to devise a suitable process for dealing with applications that ensures elected Members consider each site.**

**Communication with both mobile operators and local residents**

69. Mobile phone masts are a highly emotive issue and planning applications for such equipment often invoke significant public interest. This reflects the paradox that most people own and use a mobile phone, but many people do not want a base station located near their home. The revised policy that we propose may therefore lead to some public concern. However, we believe that this concern may reflect a lack of awareness of the vast array of scientific research that has taken place and which has been unable to demonstrate any adverse health effects from mobile phone equipment. We note that other local authorities allow telecommunications equipment to be located on their land and we feel it is important to learn from the experience of other Councils who have lifted similar moratoriums, such as Birmingham City Council. Hillingdon Council must ensure that residents understand any new policy and the reasons behind the lifting of the moratorium.

**Recommendation 2:**

**That Cabinet asks officers to ensure suitable measures are put in place to publicise the change in Council policy and the reasons for this change. We suggest that this is likely to include an article in *Hillingdon People*, a press release, and leaflets to residents' associations.**

70. Given the significant public interest in planning applications for mobile phone masts we feel that it is vital the Council ensures information on this issue is easily accessible. We are pleased to note that Hillingdon Council always takes up the option of a meeting with the five operators to discuss their annual rollout plans. This is an important meeting to share information and plan for outcomes that meet the objectives of all key stakeholders.
71. However, in light of this significant interest we feel that the Council could potentially undertake more work to involve the public through its community leadership role. Certain discussions around the rollout plan are likely to be sensitive and there is a



need to discuss some issues in private. However, we feel that the Council should host an annual meeting at which the operators explain their rollout plans for the forthcoming year to the public. In addition, the Council's excellent website is increasingly used to communicate with members of the public and we suggest that it could be used to provide more information on this issue.<sup>14</sup> We note that Basingstoke and Deane Council's website contains a map plotting proposed sites identified in the annual rollout plan and a register of all base stations in the Borough. We believe that Hillingdon residents would find similar information highly informative.<sup>15</sup>

### **Recommendation 3:**

**That Cabinet asks officers to ensure that there is an early and open dialogue between the operators, local authority and public about mobile operators' plans for network expansion, including an annual public meeting with residents' and tenants' associations, community groups, and local residents to discuss the annual rollout plan. In addition, we ask that the information available to both elected Members and the public be improved. Specifically, we recommend that the annual rollout plans, which include a register of all mobile phone masts, are published on the Council's website (as with some other Councils).**

### **Reviewing the revised policy**

72. It was vital to understand the potential implications of adopting a more flexible policy in relation to major telecommunications equipment on Council land. In particular, we wanted to hear how many new masts could potentially be installed on Council land and were pleased to hear that there was unlikely to be a sudden influx of applications for masts on Council land; operators would first have to consider their own existing sites and those held by other operators. However, as our review identifies, policies can have unintended outcomes. We firmly believe that our recommendations will have a positive impact but we feel it is important that the impact of a revised policy is reviewed after a set period.

### **Recommendation 4:**

**That a suitable body of Councillors (e.g. the Residents' and Environmental Services Policy Overview Committee) reviews the impact of the Council's revised policy in between one and two years' time, including the latest health evidence, unless there is material new evidence that warrants an earlier review.**

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<sup>14</sup> Hillingdon Council's website received almost 2.7m 'hits' in January 2007

[http://www.hillingdon.gov.uk/site\\_map/stats/days.php](http://www.hillingdon.gov.uk/site_map/stats/days.php)

<sup>15</sup> <http://www.basingstoke.gov.uk/planning/telecoms>

## CLOSING WORD

73. We believe that, if adopted, our recommendations will lead to better outcomes for Hillingdon residents, both those who regularly use mobile phones and those who are concerned about the impact of mobile phone base stations. A revised policy will also enable the Council and partners to develop new services to meet the needs of those who live and work in Hillingdon in an increasingly technological world. **As we close this report, it is important to again stress that we are not suggesting that all mobile phone masts are installed on Council land, rather there may be some occasions when Council owned land provides the best outcome for both residents and mobile operators.** We note that there are concerns about placing masts near schools and ask that any decisions about siting masts on Council land take residents' views into account.
74. Also, the change is not necessarily permanent; we recommend that Councillors review the revised policy. The Mobile Operators Association offered to pay for an independent expert to measure the emissions from a mast of the Council's choosing. We selected the O2 mast in Eastcote referred to earlier and the survey found that emissions were a tiny fraction of ICNIRP guidelines. The full report is attached as appendix 3 and we suggest that these results, and any future surveys, are used to inform any subsequent review of the policy.
75. Finally, we again thank all those who gave evidence to the Working Group and the Council's officers who advised and supported us. Without the contribution of these people our review could not have taken place.

## **APPENDIX 1: BIBLIOGRAPHY/FURTHER READING**

- Mobile Operators Association

Various fact sheets produced by the organisation representing the five mobile networks: [www.mobilemastinfo.com](http://www.mobilemastinfo.com)

- Health Protection Agency

Various fact sheets on the health implications of mobile phone technology: [http://www.hpa.org.uk/radiation/understand/information\\_sheets/mobile\\_telephony/index.htm](http://www.hpa.org.uk/radiation/understand/information_sheets/mobile_telephony/index.htm)

Results of emissions surveys: [http://www.nrpb.org/hpa/radio\\_surveys/](http://www.nrpb.org/hpa/radio_surveys/)

- Independent Expert Group on Mobile Phones (The Stewart Report)

Final report of the group established by the Government to explore health implications of mobile phone technology: <http://www.iegmp.org.uk/index.htm>

- Central Government Response to the Stewart Report

Government response to the above report: [http://www.communities.gov.uk/index.asp?id=1144593#P25\\_696](http://www.communities.gov.uk/index.asp?id=1144593#P25_696)

- World Health Organisation Fact Sheet

<http://www.who.int/mediacentre/factsheets/fs304/en/index.html>

- Planning Policy Guidance Note 8

Document that sets out the Government's policy guidance on planning applications for mobile phone masts: <http://www.communities.gov.uk/index.asp?id=1143963>

- Basingstoke and Deane Borough Council Website on Mobile Phone Base Stations

An example of best practice which contains maps showing operators' annual rollout plans and a register of all mobile phone base stations in the Borough: <http://www.basingstoke.gov.uk/planning/telecoms/>

## **APPENDIX 2: GLOSSARY**

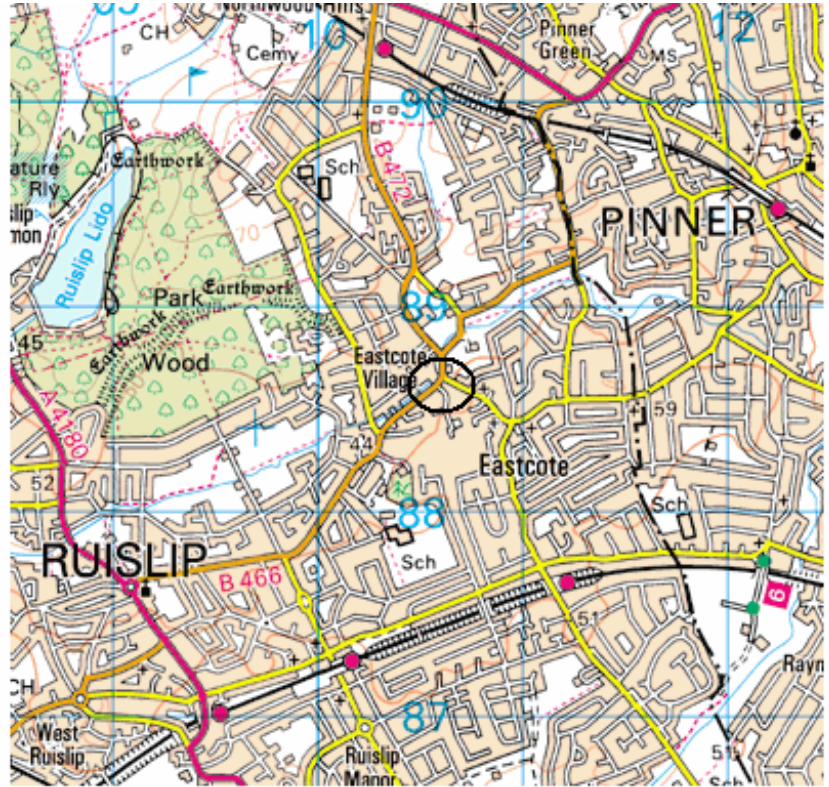
2G:	Second generation or GSM is the technology that is used for voice calls and operates at a frequency of 900MHz and 1800MHz.
3G:	Third generation is the generic term for the next generation of mobile communication systems and offers multimedia and internet access and the ability to view video footage. It operates at a frequency of 2200MHz.
BT:	British Telecom
CCTV:	Closed Circuit Television
HPA:	Health Protection Agency
ICNIRP:	International Commission on Non-Ionizing Radiation Protection (an independent scientific body which has produced an international set of guidelines for public exposure to radio frequency waves which were recommended in the Stewart Report and adopted by the Government)
IEGMP:	Independent Expert Group on Mobile Phones
MDA:	Microconnect Distributed Antennas (a new technology designed by BT to boost network coverage in urban areas)
MOA:	Mobile Operators Association
NRPB:	National Radiological Protection Board
PPG8:	Planning Policy Guidance Note 8
RF:	Radio frequency waves
WHO:	World Health Organisation

# **APPENDIX 3:**

## **INDEPENDENT SURVEY OF EMISSIONS FROM O2 MAST IN EASTCOTE**

## WireSoft Services

### ICNIRP compliance assessment of the O2 mobile communications equipment located at the junction of Eastcote High Road & High End Road, Pinner, Middlesex



#### Measurement Survey performed by WireSoft Services

This Measurement Survey was conducted by Paul Blenkinsop, Director Engineering for WireSoft Services on Friday, February 23rd 2007.

WireSoft is an engineering services company that provides a wide range of professional consultancy to mobile telecommunication operators and vendors around the world, including GSM/CDMA/UMTS network design/optimization as well as having considerable experience in carrying out emissions testing to validate whether radio base station sites meet regulatory compliance.

WireSoft has been providing service to telecommunications, project management and consultancy companies for more than 20 years in various domestic & global locations.



## Summary

Concerns were raised about the potential health risk posed by the O2 mobile communications equipment located along Eastcote High Road.

WireSoft was retained to carry out testing near to the site, to measure the ambient RF levels and to determine whether they comply with government guidelines.

O2 has licenses to operate mobile communications systems at 900MHz, 1800MHz and 2100MHz.

It was decided to baseline all readings against the 2G (GSM900) threshold since this represents the lowest permissible power threshold of all the public mobile phone technologies used today by O2 in the UK, and represents a worst case scenario.

At this frequency, the ICNIRP occupational guideline is set at a power density of 23 Watts per meter squared ( $\text{W/m}^2$ ), averaged over any six-minute period. The ICNIRP public guideline for this frequency is set at one fifth of this value at  **$4.6 \text{ W/m}^2$** , again averaged over any six-minute period. The NRPB guideline value for this frequency is set at  $35 \text{ W/m}^2$  averaged over any 15-minute period for both occupational and public situations.

The highest electromagnetic power density was found to be  **$0.004079 \text{ W/m}^2$** , which is more than **1128** times lower than the maximum permitted value of  $4.6 \text{ W/m}^2$  for public areas set by the International Commission for Non-Ionising Electromagnetic Radiation Protection (ICNIRP). This value represents a signal strength that is **0.089%** of the maximum power density set-down in by ICNIRP.

Therefore, this O2 installation conforms to the ICNIRP guidelines and the emissions do not exceed the safety limits stipulated by the ICNIRP regulatory body.

Since the ICNIRP guidelines provide for the full protection of all people at the maximum permitted values, it follows that no harm should result from the much lower values measured near the O2 phone mast in Eastcote High Road.

## **Safety Standards**

### **What is a safe level?**

In the UK, the body responsible for advising on EMF exposure levels is the National Radiological Protection Board (now the Radio Protection Division). Internationally, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) performs a similar role. Both bodies come to very similar conclusions about acceptable exposure levels, however the publication of the Stewart Report from the Independent Expert Group on Mobile Phones has led to an adoption of the ICNIRP recommendations as a precautionary approach since some of its permitted emissions thresholds were lower than those of the NRPB. In fact, the NRPB recently announced that it has restated its opinion on exposure level thresholds to be in-line with those of ICNIRP.

In addition, this adoption brings the UK into line with other countries in the European Union and accord with the Recommendations of the House of Commons Select Committee on Science and Technology Report on Mobile Phones and Health (1999) (paragraphs 6.19–6.42).

The NRPB and ICNIRP guidelines were created after careful reviews of all the health related research that had been carried out worldwide. As the research did not show causation of other health outcomes, both the NRPB and ICNIRP guidelines are designed to prevent our bodies overheating. They start from the knowledge that has been gained over the past decades, that a 1°C rise in body temperature is easily controlled by our bodies perspiring etc.

What ICNIRP has done is to first set a value for the protection of workers to limit this temperature rise to a small fraction of 1°C. This ensures their body temperatures are not elevated by any more than about 0.1°C while working at the maximum permitted occupational levels. Then, as it is assumed that working employees are healthier than the general public, the public guideline level is set at one fifth of the occupational level.

This very much lower public level is set to ensure that even when the electromagnetic power density levels are at their maximum permitted public levels, then no harm will be caused to anyone, young or old, no matter what state of health they are in.

### **Discussion**

As the ICNIRP guidelines specify averaged values; the measuring instrument was also set to record averaged values to ensure any transient events were included correctly.

The instrument probe is sensitive to a wider range of frequencies than those used by the base station near this test area. This means the recorded values also include RF contributions from other remote mobile phone installations, radio, taxi and TV transmissions etc.

Therefore, this measurement method overestimates the contribution from the O2 antennas at this site and provides a more severe assessment of the base station equipment.



## Instrumentation

The instrument used in this survey was:

Holaday HI-6005 Electric Field Probe

Sensor Type: Electric Field

Detection: Isotropic (X, Y and Z readings)

Dynamic Range: 0.5 – 800 V/m (>64 dB, Single Range)

Resolution: 0.01 V/m

Frequency Response: 100 KHz – 5 GHz

Holaday – HI4460 Graphical Readout meter

The instrument was within its calibration period and functioned normally throughout the tests.



## Measurements

The ICNIRP guidelines place the maximum public level exposure to electromagnetic power density (900MHz) at  $4.6 \text{ W/m}^2$  (Watts per square metre) averaged over any six-minute period. The measuring instrument was also set to average the measured values over this period to ensure any transient events were included correctly. The corresponding occupational guideline level is  $23 \text{ W/m}^2$ .

The instrument probe is sensitive to a wider range of frequencies than those in use at this site. Therefore the recorded values also include contributions from other remote mobile phone installations, radio and TV transmissions etc. Although this overestimates the contribution by this mobile phone installation, this is an acceptable procedure where Health & Safety is being assessed as it ensures the worse case scenario has been examined.

## Conclusions

WireSoft has evaluated the installation in compliance with the methods outlined in the Federation of the Electronics Industry document “RF Compliance Policy and Methodology for UK Cellular Base Stations” Version 2 dated 18/2/2002 (FEI document number 28/2000).

The highest electromagnetic power density was **0.004079 W/m<sup>2</sup>**, which is more than **1128** times lower than the maximum permitted value of 4.6 W/m<sup>2</sup> for public areas set by ICNIRP. This is less than **0.089%** of the ICNIRP guideline.



The ICNIRP guidelines are designed to provide for the full protection of all people, young or old at the maximum permitted values, therefore no harm should result from the much lower values found in the public areas around this O2 installation.





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## Table of Results

The attached Table of Results shows the level of electromagnetic power density measured at different points around the installation. All measured values were well within the ICNIRP guidelines for public places.



<p>Photo Number</p> <p>1</p>	<p>Half way along Azalea Walk</p> 	<p>Measured Power Density <math>W/m^2</math></p> <p>0.00099</p>	<p>Times below the <math>4.6 W/m^2</math> ICNIRP Guideline</p> <p>4645</p>
<p>2</p>	<p>Junction of Azalea Walk &amp; Eastcote High Road</p> 	<p>Measured Power Density <math>W/m^2</math></p> <p>0.001234</p>	<p>Times below the <math>4.6 W/m^2</math> ICNIRP Guideline</p> <p>3728</p>

3	<p>Corner of Eastcote High Road &amp; Field End Road</p> 	<p>Measured Power Density W/m<sup>2</sup></p> <p>0.001341</p>	<p>Times below the 4.6 W/m<sup>2</sup> ICNIRP Guideline</p> <p>3431</p>
4	<p>Along Field End Road – Mast in background</p> 	<p>0.001464</p>	<p>3141</p>




5	<p>Corner of Field End Road and Pamela Gardens</p> 	<p>Measured Power Density W/m<sup>2</sup></p> <p>0.001784</p>	<p>Times below the 4.6 W/m<sup>2</sup> ICNIRP Guideline</p> <p>2579</p>
6	<p>Opposite Mast - Eastcote High Road &amp; Field End Road</p> 	<p>0.001274</p>	<p>3611</p>

7	<p style="text-align: center;">Opposite Mast in Park Entrance</p> 	<p>Measured Power Density W/m<sup>2</sup></p> <p style="text-align: center;">0.001512</p>	<p>Times below the 4.6 W/m<sup>2</sup> ICNIRP Guideline</p> <p style="text-align: center;">3042</p>
8	<p style="text-align: center;">Next to Phone Mast Cabinets</p> 	<p style="text-align: center;">0.004079</p>	<p style="text-align: center;">1128</p>

<p>9</p>	<p>Next to Phone Mast Cabinets – Position 2</p> 	<p>Measured Power Density W/m<sup>2</sup></p> <p>0.003268</p>	<p>Times below the 4.6 W/m<sup>2</sup> ICNIRP Guideline</p> <p>1408</p>
<p>10</p>	<p>Junction of Joel Steet &amp; Eastcote High Road</p> 	<p>0.001296</p>	<p>3549</p>



11	<p data-bbox="379 197 1015 230">Back of Mast –Entrance to Eastcote Tennis Club</p> 	<p data-bbox="1098 197 1230 338">Measured Power Density W/m<sup>2</sup></p> <p data-bbox="1106 488 1230 521">0.001445</p>	<p data-bbox="1270 197 1433 322">Times below the 4.6 W/m<sup>2</sup> ICNIRP Guideline</p> <p data-bbox="1318 488 1385 521">3184</p>
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