Agenda Item 7

Haringey Council

Agenda item: **5**

Overview & Scrutiny Committee **On 2nd July 2007**

Report Title: **Wi-Fi in Schools**

Forward Plan reference number (if applicable): **Not Applicable**

Report of: **Deputy Director of the Children & Young People's Service (Business Support & Development)**

Wards(s) affected: **All**

Report for: **Information Only**

1. Purpose

1.1 The Overview & Scrutiny Committee has requested a report into the safety of Wi-Fi networking in schools.

2. Introduction by Cabinet Member (if necessary)

Not Applicable

3. Recommendations

None

Report Authorised by:

p.p. Director of the Children & Young People's Service

Contact Officers: **Max Riley, Head of Education ICT Services**

4. Director of Finance Comments

Not Applicable

5. Head of Legal Services Comments Not Applicable
6. Local Government (Access to Information) Act 1985 **6.1 Background Documents** Sited in text and appendices **6.2 Reasons for exemption or confidentiality** None Identified

7. Background

7.1 Haringey Council has received a number of communications from residents and parent groups expressing concern at the possible health risks to children attending schools that have deployed and/or are considering deploying wireless connections (aka Wi-Fi) as part of their computer networks. They draw upon a number of Internet-based sources in support of their concern.

7.2 The communications advocate adoption of a "precautionary principle" which states that if there are reasonable scientific grounds for believing that a new process or product may not be safe, it should not be introduced until there is convincing evidence that the risks are small and are outweighed by the benefits. They argue, accordingly, that installation of Wi-Fi systems in schools should be ceased until such time as they can be proven to not harm any children who are exposed to them.

7.3 The broadcast of a BBC "Panorama" documentary programme on 21st May entitled "Wi-fi: a warning signal" has further raised the profile of the issue of safety of Wi-fi in schools, although some scientists have accused the programme as being "scaremongering" and "inconclusive".

7.4 The **BBC News** website includes informative background information on Wi-Fi in an article entitled "**Q&A Wi-fi health concerns**" at news.bbc.co.uk/1/hi/technology/6677051.stm, attached to this report as **Appendix A** and a follow-up article to the Panorama programme entitled "**Wi-fi health fears are 'unproven'**" at news.bbc.co.uk/1/hi/technology/6676129.stm , attached to this report as **Appendix B**.

7.5 It is estimated that Wi-Fi networks have been installed in around 70 per cent of the UK's secondary schools and half of all primaries and the Professional Association of Teachers (PAT) has called for the government to commission a scientific investigation into the effects of wireless technology in schools, echoing Sir William Stewart's request for more research to be carried out.

7.6 The installation or otherwise of Wi-Fi networking facilities in schools is ultimately at the discretion of each school's own governing body and Headteacher. Haringey

Council's role is to provide advice and support to schools based upon best guidance and good practice.

8. Sources of Advice on WiFi Safety

8.1 There is a vast amount of material available on the Internet that can be found to support almost any argument / position on almost any subject. A Google Advanced Search for websites containing both "WiFi" and "Safety" found over 1.8million 'hits'.

8.2 Haringey Council employees are not qualified to judge the technical merits and interpretation of research carried out by various agencies or to judge the veracity of conflicting views being expounded by various experts in the scientific community.

8.3 In these circumstances, Council staff routinely seek the guidance of their appropriate professional institutions, i.e.

- The British Educational Communications and Technology Agency (**Becta**) provides support to the education sector – "to make the best use of technology so that every learner in the UK is able to benefit from its advantages and achieves the best they can".

  Becta's website contains the following wi-fi statement at news.becta.org.uk/display.cfm?resID=33517 :-

  Following Monday night's (21 May 2007) Panorama programme, Becta has been in contact with the Health Protection Agency (HPA) - the government agency responsible for health and safety - to obtain the latest guidance on any health issues relating to wireless technology.

  Despite the claims made in Monday night's programme, the HPA's guidance remains the same. The latest advice on their website reads:

  "On the basis of current scientific information wi-fi equipment satisfies international guidelines. There is no consistent evidence of health effects from RF exposures below guideline levels and therefore no reason why schools and others should not use wi-fi equipment."

- The Association of Directors of Children's Services (**ADCS**) is "the national leadership Association in England for statutory directors of children's services and other children's services professionals in leadership roles, working closely with Ministers, government officials, the community and voluntary sectors, local government organisations and other key local and national agencies on the implementation and implications of *The Children Act 2004* and the *Change for Children* programme, the children's workforce, local authority and school inspections".

ADCS has issued a statement (see **Appendix C** for the full text) that includes the view that :-

The key reference agencies in this matter are Becta and the Health Protection Agency.

- The Society of Information Technology Management (**SOCITM Consulting**) acting on behalf of the Local Authority Building Schools for the Future (LA BSF) team consulted Becta regarding Wi-Fi safety and received the following response :-

  Tonight's (Monday) Panorama programme (BBC One, 8.30pm) will be devoted to WiFi. We have worked closely with the Health Protection Agency and DfES preparing a briefing on WiFi for the Secretary of State.

  Becta will be issuing a statement following the programme and this will be published on our website tomorrow (Tuesday) morning. (http://news.becta.org.uk).

  On the basis of current evidence and expert safety advice, Becta believes that there is no need to change its current guidance, namely that while secure wireless networks can complement an institution's wired network, they should not replace it.

  Further information on WiFi safety is available on the Health Protection Agency website.

- The Health Protection Agency (**HPA**) "provides an integrated approach to protecting UK public health through the provision of support and advice to the NHS, local authorities, emergency services, other Arms Length Bodies, the Department of Health and the Devolved Administrations". The HPA includes the former National Radiological Protection Board (NRPB).

  As can be seen from the institutional information above, the HPA is widely regarded as the definitive source of information and advice in the UK about Wi-Fi safety.

  Information regarding Wi-Fi safety at the HPA's website www.hpa.org.uk/radiation/understand/radiation_topics/emf/wifi.htm is as follows :-

WiFi Summary

General position

There is no consistent evidence to date that WiFi and WLANs adversely affect the health of the general population. The signals

are very low power, typically 0.1 watt (100 milliwatts) in both the computer and the router (access point) and the results so far show exposures are well within internationally accepted (ICNIRP) guidelines. Based on current knowledge and experience, radio frequency (RF) exposures from WiFi are likely to be lower than those from mobile phones. Also, the frequencies used in WiFi are broadly the same as those from traditional RF applications.

On the basis of the studies so far carried out in house, the Agency sees no reason why WiFi should not continue to be used in schools. However with any new technology it is a sensible precautionary approach, as happened with mobile phones, to keep the situation under ongoing review so that parents and others can have as much reassurance as possible. That is why our Chairman, Sir William Stewart, has stated it would be timely to carry out further studies as this new technology is rolled out. The Health Protection Agency is discussing this with relevant parties.

Basics

WiFi is short for Wireless Fidelity and is a particular type of wireless local area network (WLAN) – i.e., you don't need to plug your computer into a phone network via a cable. There are many types of WLAN but all of them allow two or more computers to form a network using radio frequency (RF) signals. They allow users to access and share data, applications, internet access or other network resources in the same way as wired (cable) systems. For more information, see http://www.hpa.org.uk/radiation/understand/radiation_topics/emf/wlans.htm

ICNIRP is the International Commission on Non-Ionizing Radiation Protection. See http://www.icnirp.org

Key Points

- *There is no consistent evidence to date that exposure to RF signals from WiFi and WLANs adversely affect the health of the general population*
- *The signals from WiFi are very low power, typically 0.1 watt (100 milliwatts) in both the computer and the mast (or router) and resulting exposures should be well within internationally accepted guidelines*
- *The frequencies used are broadly the same as those from other RF applications such as FM radio, TV and mobile phones*

- *Based on current knowledge, RF exposures from WiFi are likely to be lower than those from mobile phones*
- *On the basis of current scientific information, exposures from WiFi equipment satisfy international guidelines. There is no consistent evidence of health effects from RF exposures below guideline levels and no reason why schools and others should not use WiFi equipment.*

9. Conclusions

9.1 All the professional institutions in the UK referenced by Haringey Council staff that have taken a position on Wi-Fi safety ultimately defer to the HPA's guidance, i.e. that there is *"no reason why schools and others should not use wi-fi equipment"*.

9.2 The UK Government, supported by the World Health Organisation and the HPA maintains there are no health risks associated with long-term exposure to low-level radiation from Wi-Fi systems.

9.3 Wi-Fi facilities enable flexible use of portable IT equipment in fixed and temporary classroom accommodation without being tied to multiple hard-wired Local Area Network connections. This includes provision of mobile IT suite(s), support for group student activities using shared learning materials and the ability of staff to link their laptop computers to LAN-based resources from anywhere in the school without disrupting existing connections.

9.4 Wi-Fi installations in Haringey schools are complementary to hard-wired network connections and provide 'local' extensions to IT infrastructure, enabling access to on-line resources from locations with limited accessibility.

9.5 The 'precautionary principle' referred to earlier cannot apply as the likelihood of harm being realised is extremely low and evidence supporting the consequence of exposure is unable to prove that it is detrimental to health.

9.6 Haringey Council is circulating the ADCS document at Appendix C to Headteachers in all its schools and defers to HPA advice, i.e.

"On the basis of current scientific information WiFi equipment satisfies international guidelines. There is no consistent evidence of health effects from RF exposures below guideline levels and therefore no reason why schools and others should not use WiFi equipment."

9.7 Haringey Council staff will monitor the HPA website for any changes arising from Sir William Stewart's recommendation and the Professional Association of Teachers' request for more research to be carried out into Wi-fi safety and will update its advice to schools as and when appropriate.

10. Use of Appendices / Tables / Photographs

10.1	Appendix A	Q&A: Wi-fi health concerns (BBC News website)
10.2	Appendix B	Wi-fi health fears are 'unproven' (BBC News website)
10.3	Appendix C	Wi-Fi note from Association of Directors of Children's Services

APPENDIX A

BBC NEWS

Q&A: Wi-fi health concerns

A number of education professionals have raised concerns about the use of wi-fi internet networks in schools, following a Panorama report into the technology. So just how safe is it?

What is wi-fi?

Wi-fi is the acronym for Wireless Fidelity, essentially a set of standards for transmitting data over a wireless network.

Wi-fi allows you to connect to the net at broadband speeds without cables, as long as you have the right equipment and, in most cases, a regular internet service provider and a wi-fi account.

How does it work?

Wireless uses radio waves of a particular frequency - in this case 2.4Ghz - to send and receive data. It is the same frequency on which microwaves, cordless phones and Bluetooth devices work - which can cause interference between these gadgets when used in conjunction on the same channel.

Radiowaves such as wireless are a type of radiation, called non-ionising. This radiation includes microwaves, infrared light, mobile phone communications and visible light.

Ionising radiation, such as X-Rays, can be destructive to biological tissue, and can cause DNA damage in cells.

Non-ionising radiation does not carry enough energy to ionise atoms and at high levels of exposure can only excite atoms, causing heating.

This is the process by which microwave ovens heat food, by exciting the molecules that are exposed to the radiation.

A typical microwave oven has 100,000 times the radiation intensity of a wi-fi network.

What are the concerns over wi-fi safety?

Some scientists have reported that low levels of non-ionising radiation can cause damage to chromosomes. But there is currently no scientific evidence that wi-fi, in particular, causes this to happen.

There is speculation that low level radiation can do more than just excite atoms, a non-thermal interaction, but again there is no current evidence to suggest this is possible.

Recent concerns over mobile phone use and children - the UK government recommends that young children do not use mobiles as their skulls are thinner than adults - have given rise to concerns over wi-fi.

The Health Protection Agency points out that a person sitting in a wi-fi hotspot for a year would be exposed to only the same amount of radiation from a 20-minute mobile phone call.

So is wi-fi 100% safe?

Scientists distinguish between a current lack of evidence to show that wi-fi is unsafe and definitively saying something 100% harmless.

Some people have called for more research into wi-fi, to prove that it is safe.

But it is impossible to prove a negative, scientists point out; there is no way of demonstrating that wi-fi has zero effect on someone.

Should I err on the side of caution and stop using wi-fi?

The World Health Organisation says there is no risk from low level, long-term exposure to wi-fi networks.

However, Professor Lawrie Challis, chairman of the Mobile Telecommunications and Health Research (MTHR) programme management committee, encourages young children not to use a computer on their lap and to place it on a table.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/technology/6677051.stm

Published: 2007/05/21 12:47:43 GMT

APPENDIX B

Wi-fi health fears are 'unproven'

Scientists have said there is no evidence to suggest a link between the use of wi-fi and damage to health.

BBC programme Panorama found that radiation levels from wi-fi in one school was up to three times the level of mobile phone mast radiation.

The readings were 600 times below the government's safety limits but there is ongoing debate about wi-fi use.

Sir William Stewart, chairman of the Health Protection Agency, has said there needs to be a review of wi-fi.

He told Panorama that there was evidence that low-level radiation - from devices like mobile phones and wi-fi - did cause adverse health effects.

But some experts in the scientific community have disagreed with his assessment.

"Wi-fi seems unlikely to pose any risk to health," said Professor Lawrie Challis, of Nottingham University.

Prof Challis, chairman of the Mobile Telecommunications and Health Research (MTHR) programme management committee, said: "Wi-fi exposures are usually very small - the transmitters are low power and some distance from the body.

"They can be near to the body, however, when a laptop is on one's lap and my own view is that just as we encourage young children not to use mobile phones we should also encourage them to use their laptops on a table rather than their lap, if they are going online for a long time."

As part of its investigation, Panorama visited a school in Norwich, with more than 1,000 pupils, to compare the level of radiation from a typical mobile phone mast with that of wi-fi in the classroom.

Readings taken for the programme, broadcast on BBC One on Monday, showed the height of wi-fi signal strength to be three times higher in the school classroom than the main beam of radiation intensity from a mobile phone mast.

Greatest intensity

Sir William recommended to the government in 2002 that the beam of greatest intensity from a phone mast should not fall on any part of the school grounds, unless the school and parents agreed to it.

Medical physics expert Professor Malcolm Sperrin told BBC News that the fact wi-fi radiation in a particular school was three times higher than a mobile phone mast was irrelevant, unless there was any evidence of a link to health effects.

"Wi-fi is a technique using very low intensity radio waves. Whilst similar in wavelength to domestic microwave radiation, the intensity of wi-fi radiation is 100,000 times less than that of a domestic microwave oven.

"Furthermore, tissue can only be effectively heated by a wavelength that is closely matched to the absorption, and there are strict guidelines for ensuring such absorption peaks are avoided."

The type of radiation emitted by radio waves (wi-fi), visible light, microwaves and mobile phones has been shown to raise the temperature of tissue at very high levels of exposure - called a thermal interaction - but there is no evidence that low levels cause damage.

The Health Protection Agency has said that sitting in a wi-fi hotspot for a year results in receiving the same dose of radio waves as making a 20-minute mobile phone call.

"Some people suspect a non-thermal interaction but there is no evidence to suggest that this exists and indeed it is unlikely," said Prof Sperrin.

Research proceeding

He added: "Radio waves (wi-fi) and other non-ionising radiations have been part of our lives for a century or more and if such effects were occurring then damage or other untoward effects would have been recorded and studied.

> **It's impossible to prove that something has no effect**
> Professor Malcolm Sperrin

"Research is still proceeding in this area at leading centres in many countries but evidence points to wi-fi transmissions being well below any likely threshold for human effects."

Panorama spoke to Professor Olle Johansson, of the Karolinska Institute in Sweden, who said there had been many recorded effects such as chromosome damage from low-level radiation.

Professor Henry Lai, from Washington state university, also quoted in Panorama, said he had found health effects at similar levels of radiation to wi-fi.

He estimated that of the two to three thousand studies carried out over the last 30 years, there is a 50-50 split - half finding an effect with the other half finding no effect at all.

But Professor Will J Stewart, fellow of the Royal Academy of Engineering, said: "Science has studied the safety of mobile phones for many years and the overwhelming body of evidence shows little cause for concern.

"As for wi-fi, although these devices operate at a modestly different frequency to mobiles they also operate at a lower power level over a much shorter-range.

'No issue'

"Add to the fact that high-bandwidth wi-fi devices are less likely to be head-mounted and there really is no issue here.

"This is not to say that all electromagnetic radiation is necessarily harmless - sunlight, for example, poses a significant cancer risk; so if you are using your laptop on the beach make sure and get some shade."

Professor Sperrin said one of the difficulties around wi-fi research was that it was impossible to prove a negative.

"It's impossible to prove that something has no effect," he said.

He said there was no justification in discarding wi-fi until it could be proved unsafe.

"The educational benefits from using laptops and having access to information far outweigh any unproven fears over the safety of wi-fi. I am more concerned about the heat laptops generate and the impact that could on sensitive parts of the body."

Wi-fi: a warning signal, Panorama, Monday, 8.30pm, BBC1.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/technology/6676129.stm

Published: 2007/05/21 10:58:35 GMT

APPENDIX C

ADCS
Leading Children's Services

WiFi – Panorama Programme 21 May 2007

The Panorama programme about WiFi broadcast on Monday 21 May raised a number of issues about the installation and use of WiFi systems in schools and by children. This note is intended provide some background information and guidance to DCSs in respect of this issue.

Summary

There is no evidence to date that exposure to the radio frequency (RF) signals from WiFi and WLANs adversely affect the health of the general population. In addition, HPA advice is:

- The signals from WiFi are very low power, typically 0.1 watt (100 milliwatts) in both the computer and the mast (or router) and resulting exposures should be well within internationally accepted guidelines.
- The frequencies used are broadly the same as those from 'traditional' RF applications.
- Based on current knowledge, RF exposures from WiFi are likely to be lower than those from mobile phones.

On the basis of current scientific information WiFi equipment satisfies international guidelines. There is no consistent evidence of health effects from RF exposures below guideline levels and therefore no reason why schools and others should not use WiFi equipment.

Background Information

WiFi is short for Wireless Fidelity and is a particular type of wireless local area network (WLAN) – i.e., you don't need to plug your computer into a phone network via a cable. There are many types of WLAN but all of them allow two or more computers to form a network using radio frequency (RF) signals. They allow users to access and share data, applications, internet access or other network resources in the same way as wired (cable) systems.

The key reference agencies in this matter are Becta and the Health Protection Agency.

Becta's position is as follows –

“Following Monday night's (21 May 2007) Panorama programme, Becta has been in contact with the Health Protection Agency (HPA) - the government agency responsible for health and safety - to obtain the latest guidance on any health issues relating to wireless technology.

Despite the claims made in Monday night’s programme, the HPA’s guidance remains the same. The latest advice on their website reads:

"On the basis of current scientific information WiFi equipment satisfies international guidelines. There is no consistent evidence of health effects from RF exposures below guideline levels and therefore no reason why schools and others should not use WiFi equipment."

Based on this guidance, and expert safety advice, Becta believes that there is no need to change its current guidance: while secure wireless networks can complement an institution's wired network, they should not replace it.”

The HPA’s website (follow link above)

http://www.hpa.org.uk/radiation/understand/radiation_topics/emf/wifi.htm

provides useful background information and further advice.

The Association of Directors of Children’s Services

Humanities Building Devas Street University of Manchester Oxford Road Manchester M13 9PL
Tel:0161 275 8810 Fax: 0161 275 8811 Email: info@adcs.org.uk Website: www.adcs.org.uk