

CABINET



Report subject	Smart Place Pilot (Lansdowne)
Meeting date	20 December 2019
Status	Public Report
Executive summary	<p>This report seeks Cabinet approval to conduct the Smart Place Pilot project at the Lansdowne as an initial proof of concept project for the wider Smart Place Programme, which is the subject of a separate Cabinet report.</p> <p>This project is primarily supported by £1m of Dorset LEP funding, with local match funding of £330k. This funding is in addition to the £900k already secured for digital technology deployment through the Lansdowne Business District Project.</p> <p>This project supports a number of themes within the Council's new Corporate Strategy.</p> <p>Funding for the project is due to be spent by March 2021.</p>
Recommendations	<p>It is RECOMMENDED that Cabinet approve:</p> <ol style="list-style-type: none"> 1. The deployment of the Smart Place Pilot (Lansdowne) including: <ol style="list-style-type: none"> (i) The development of proof of concept Smart Place 'use case' trials, typically in health; environment; transport, tourism and public security etc. (ii) The development of proof of concept Smart Place 'Applications & Services', typically in transport, volunteering and retail etc. (iii) A small, temporary sub-6 GHz 5G trial network; (iv) A small, temporary 26.5 GHz 5G trial network; (v) Continuous monitoring of electromagnetic field (EMF) emissions from the 5G trial networks to ensure compliance with Public Health England (ICNIRP) guidelines (in accordance with recommendation b) from the Overview & Scrutiny 5G Call for Evidence) 2. Council formally accepts £1m grant funding from the Dorset Local Enterprise Partnership (DLEP) in order to progress the scheme, and amends the Capital Investment Programme (CIP) accordingly

	<p>It is RECOMMENDED that Cabinet note:</p> <p>3. The recommendations from Overview & Scrutiny relating to the ‘5G Call for Evidence’ public consultation namely:</p> <p>a) That Cabinet be asked to consider equitable ways to involve the public more in the consultation around the planning implications of the implementation of 5G technology, particularly with regard to the siting of masts.</p> <p>b) That if Cabinet is minded to approve the deployment by the Council of 5G connectivity as part of the Lansdowne Digital Pilot continuous monitoring takes place to ensure that the levels of radio wave emissions fall within the internationally recognised limits, and the findings be reported back to the Overview and Scrutiny Board.</p> <p>c) That the Board agrees that all information submitted in its call for evidence in relation to 5G connectivity be passed to Public Health England to consider for inclusion in future reviews.</p> <p>d) That a framework be established for feedback to be provided to the Council in relation to the call for evidence information passed to Public Health England.</p> <p>Note: In discussing this item, the Chairman [of O&S] agreed on behalf of the Board to request through Cabinet that the Council contacts other relevant local authorities with regard to their work in this area, including those who have agreed to be Government funded test bed areas and those who have declared a moratorium.</p> <p>4. £900k has already been secured for digital infrastructure through the Lansdowne Business District Growth Deal project. This project includes:</p> <p>(i) Ducting and fibre around the Lansdowne area (already installed);</p> <p>(ii) Public Wi-Fi network (about to be procured)</p> <p>(iii) Connection to a commercial data centre</p> <p>(iv) Internet of Things Network</p>
Reason for recommendations	<p>To trial Smart Place use cases, applications and services, utilising new digital technologies, to evidence and quantify social, environmental, economic and financial benefits likely to accrue from the wider Smart Place Programme.</p> <p>To support delivery of the new Corporate Strategy.</p> <p>To progress and ensure delivery of this Local Enterprise Partnership (LEP) funded project.</p>

Portfolio Holder(s):	Councillor Vikki Slade (Leader of the Council)
Corporate Director	Bill Cotton, Executive Director Economy & Regeneration
Contributors	Adrian Hale, Ruth Spencer, Chris Shephard
Wards	Bournemouth Central
Classification	For Recommendation, Decision and Update and Information

Background

Project Benefits

1. It is predicted that there is significant social, environmental, economic, and financial (Council) value in a 'Smart Place' approach to delivering services. This Smart Place Pilot (Lansdowne) provides the opportunity to conduct initial proof of concept Smart Place 'use case' trials and to develop new Smart Place applications and services, utilising underpinning digital connectivity. This will help demonstrate and quantify potential social, health, environmental and economic benefits likely to accrue from the wider Smart Place programme. (Note: A separate Cabinet report setting out the strategy, purpose and potential value of the BCP Smart Place Programme is due to come to Cabinet in January 2020). It will also help to assess the value that new digital technologies such as 5G could bring to delivering services in the future.
2. The economic benefits of the pilot project were set out in an Outline Business Case (OBC) submitted to the Dorset LEP in July 2019, which led to £1m of LEP funding being secured for the project. The OBC calculated a benefit-to-cost ratio of 104:1 which represents very high value for money.

Project Description

3. This project enables initial pilot Smart Place initiatives to take place as set out below:

(i) **The development of proof of concept Smart Place 'use case' trials:**

Following consultation across Council directorates, with the Dorset Clinical Commissioning Group, with Dorset Police and with the Community Volunteer Service (CVS), various potential Smart Place use case trials have been identified for the area. Typically, these could include use cases in health; environment; transport, tourism and public security etc. (A use case trial is typically a proof of concept trial of an initiative aimed at establishing the value and benefits of that particular initiative). There is the potential to extend the Smart Place trials to enhance special events such as the Bournemouth Air Festival, the Poole Maritime Festival, The Arts by the Sea Festival and the Christmas Tree Wonderland.

(ii) The development of proof of concept Smart Place Applications & Services

The formation of BCP Council's Smart Place Research & Development (R&D) Consortium has enabled close working with partners. For creative & digital Small and Medium Enterprises (SMEs) this provides the opportunity to develop new Smartphone apps, typically around transport, health, retail, public safety, environment etc. Some of the consortium partners are already in the process of developing new Smart Place apps.

4. To enable Smart Place trials to take place there is the need to provide underpinning digital infrastructure. This project builds upon the digital infrastructure work already taking place at the Lansdowne, namely ducting and fibre, public Wi-Fi and Internet of Things (IoT) networks. This particular pilot project has a focus upon exploring how emerging 5G technologies can enhance Smart Place outcomes. 5G enables lower latency (faster transfer of data) i.e. quicker download and upload speeds, and greater capacity of the network, i.e. enables more people to access data on more devices at the same time. Whilst the radio technology underlying 5G is well proven, the deployment of 5G networks is still relatively new. Due to the innovative nature of the proposed Lansdowne pilot the details outlined below may be subject to change in order to maximise the benefits from the proof of concept Smart Place trials.

(iii) A small, temporary sub-6 GHz 5G trial network:

This is currently proposed to consist of up to 4 no. sub-6 GHz antennae located along Christchurch Road, between Lansdowne Roundabout and St. Swithun's Roundabout. This minor network will operate at similar frequencies to those being proposed in the future by commercial mobile network operators. This location has been selected due to the proximity to a number of digital/creative SMEs who can conduct trials on the network and create new apps. There may be the need to partner with a Mobile Network Operator in order to access radio frequency spectrum. It is estimated that the network would be operational for approximately two years to enable meaningful trials to take place.

(iv) A small, temporary 26.5 GHz 5G trial network:

This is currently proposed to consist of up to 3 no. 26.5 GHz antennae located along St. Pauls Road, between St. Pauls Roundabout and Station Roundabout. This location has been selected due to the proximity to Bournemouth University's new Medical Science Faculty. This network will primarily focus upon machine (as opposed to phone) connectivity – e.g. robotics. Temporary radio frequency spectrum licences have already been granted by Ofcom. It is estimated that the network would be operational for approximately two years to enable meaningful trials to take place.

5. In order to run and manage the 5G trial networks it may be necessary to connect to a remote 5G-enabled Core Network, located elsewhere in the UK.
6. The electromagnetic field (EMF) emission levels from the proposed 5G networks will be continuously monitored to ensure compliance with limits set by Public

Health/ICNIRP. This is also in accordance with recommendation b) from Overview & Scrutiny (see below).

Project Programme

7. The provisional programme for the Smart Place Pilot (Lansdowne) is set out below:

Complete sub-6 GHz 5G network at the Lansdowne	July 2020
Complete 26GHz 5G network at the Lansdowne	July 2020
Connect into UK5G Exchange or other 5G Core network	July 2020
Test and commission the Lansdowne digital network	August 2020
Continuously monitor EMF emissions from the 5G networks	August 2020 onwards
Conduct Smart Place, 5G enabled, use case trials	Sept 2020 onwards
Create and deploy Smart Place apps	Jan 2020 onwards
Work with Dorset manufacturers and global chipset manufacturers to accelerate the manufacturing of 5G-machines in Dorset	Jan 2020 onwards
Test 5G Machines and 5G Applications on the pilot network	Sept 2020 onwards

Overview & Scrutiny 5G Call for Evidence and Recommendations

8. Overview and Scrutiny has conducted a comprehensive '5G Call for Evidence' public consultation exercise to understand the implications of this new technology. This call looked at the perceived benefits and dis-benefits of deploying 5G networks, including concerns expressed by some local people around the impacts upon human health and the environment. Full details of this call for evidence, including evidence submitted, minutes of meetings and recommendations is available to elected members. A summary of the call for evidence that led to the recommendations listed below is given at **Appendix A**.
9. Following the meeting on 11 November 2019 The Overview and Scrutiny Board resolved the following recommendations:
 - a) That Cabinet be asked to consider equitable ways to involve the public more in the consultation around the planning implications of the implementation of 5G technology, particularly with regard to the siting of masts.
 - b) That if Cabinet is minded to approve the deployment by the Council of 5G connectivity as part of the Lansdowne Digital Pilot continuous monitoring takes place to ensure that the levels of radio wave emissions fall within the internationally recognised limits, and the findings be reported back to the Overview and Scrutiny Board.
 - c) That the Board agrees that all information submitted in its call for evidence in relation to 5G connectivity be passed to Public Health England to consider for inclusion in future reviews.
 - d) That a framework be established for feedback to be provided to the Council in relation to the call for evidence information passed to Public Health England.

Note: In discussing this item, the Chairman [of O&S] agreed on behalf of the Board to request through Cabinet that the Council contacts other relevant local authorities with regard to their work in this area, including those who have agreed to be Government funded test bed areas and those who have declared a moratorium.

10. Officers support the recommendations from the Overview and Scrutiny Board and it is for Cabinet to decide upon their implementation.

Government Guidance

11. A letter to Local Authorities from the Parliamentary Under Secretary of State for Digital and Broadband has recently been received by BCP Council. This letter reiterates information within the National Planning Policy Framework that in regard to planning decisions these should be made upon planning grounds only and that Councils should not set health safeguards different to the International Guidelines for public exposure [to electromagnetic fields]. **See Appendix B.**

Summary of financial implications

12. The total cost of the project is £1.33m. £1m of funding is provided by Dorset LEP. It is anticipated that £330,000 of match funding will be provided in the form of BCP Council revenue staff costs, support funding from private investment, cost discounts by the equipment vendors and third-party project management time. Approximately £235,000 of BCP staff time is planned between March 2019 and March 2021. Additional funding of approximately £60,000 is also being provided by both BCP Council and Bournemouth University to fund a PhD student. The remaining £35,000 of local funding will be from 'in kind' support from suppliers and BCP Council's Smart Place R&D Consortium partners. There is no additional financial burden upon the Council. The breakdown of indicative costs is given below.

Expenditure Item	Cost (£)
Sub 6GHz 5G equipment	300,000
26GHz 5G equipment (to be procured)	300,000
Additional ducting and fibre around the Lansdowne area	200,000
Core Network, Hardware and Software,	200,000
Design costs	50,000
Project Management costs	230,000
Other support costs (legal, procurement etc.)	50,000
Total	1,330,000

Summary of legal implications

13. In regard to construction and installation of equipment the Council has an obligation to comply with health and safety legislation including the Health & Safety at Work Act 1974 and the Construction (Design & Management) Regulations 2015.
14. In regard to operating wireless equipment the Council needs to comply with Public Health England guidelines which in turn refer to the levels for electromagnetic field (EMF) non-ionizing radiation set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP).
15. In accordance with recommendation b) from Overview & Scrutiny Board (O&S), the proposed trial 5G networks at the Lansdowne (and any temporary event

deployments elsewhere) will be continuously monitored to ensure compliance with the ICNIRP guidance.

16. As part of the O&S 5G Call for Evidence, some evidence supplied suggested that some insurers would not insure against exposure to EMF radiation. This is currently being investigated by the Council's insurance team and their current advice is whether insured or not, "mitigating any manageable challenges will contribute to the success of the project". The proposed continuous monitoring of the network to ensure compliance with ICNIRP's health and environmental standards will help to mitigate any risk to the Council. Public Health Dorset has confirmed that there is no substantiated evidence of health implications resulting from 5G technology. In view of this, the continuous monitoring of EMF radiation and the location and temporary nature of the 5G deployments involved in this project, the likelihood of successful claims being made against the Council is low.
17. Planning permission will be required for the deployment of the 5G networks.

Summary of human resources implications

18. Two existing full-time roles will continue to support the Smart Place programme including this Smart Place Pilot (Lansdowne).

Summary of environmental impact

19. There will be a small visual impact upon the built environment due to the installation of antennae.
20. Concerns have been expressed by members of the public regarding the impact upon the environment from deploying 5G networks. These concerns have been considered by Overview and Scrutiny (see Appendix A) and reflected in their recommendations. The Council will comply with the levels set for non-ionizing radiation (NIR) by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) which provides advice and guidance on protecting the environment from NIR exposure.
21. In accordance with recommendation b) from Overview & Scrutiny Board (O&S), the proposed trial 5G networks at the Lansdowne (and any temporary event deployments elsewhere) will be continuously monitored to ensure compliance with the ICNIRP guidance.
22. A number of the Smart Place use case trials and applications will aim to provide a positive impact upon the environment, such as promoting sustainable travel.

Summary of public health implications

23. A number of the Smart Place use case trials and applications will specifically aim to provide a positive impact upon health outcomes, particularly in Adult and Social Care.
24. Concerns have been expressed by members of the public regarding the impact upon public health from deploying 5G networks. These concerns have been considered by Overview and Scrutiny (see Appendix A) and reflected in their

recommendations. The Council will comply with the levels set for non-ionizing radiation (NIR) by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) which provides advice and guidance on protecting human health from NIR exposure.

25. In accordance with recommendation b) from Overview & Scrutiny Board (O&S), the proposed trial 5G networks at the Lansdowne (and any temporary event deployments elsewhere) will be continuously monitored to ensure compliance with the ICNIRP guidance.

Summary of equality implications

26. There will be a beneficial impact upon equality through the trialling of new Smart Place use cases and applications, typically by providing better and more accessible transport information for people with disabilities or on low incomes.

Summary of risk assessment

27. Key risks to the project are set out below.

Key Risks

Description of risk	Initial risk			Description of likely impact and consequences if risk occurs	Risk response(s)	Risk following response			Risk owner
	Probability	Impact	Score			Probability	Impact	Score	
Delay in securing proof of concept sub 6GHz 5G kit from vendor	2	3	6	Delays to deploying sub-6 GHz 5G network	Seek supply of kit from another pilot area	1	2	2	BCP
Delay in securing proof of concept 26GHz 5G kit from vendor	2	3	6	Delays to deploying 26GHz 5G network	Seek supply of kit from another pilot area	1	2	2	BCP
Sub 6 GHz spectrum not secured from Ofcom	2	3	6	Trials of sub 6 GHz equipment cannot take place.	Mitigation is to 'loan' spectrum from existing owners (Mobile Network Operators) Alternatively it is possible to switch to higher (60GHz+) frequency bands, which do not require an Ofcom licence	2	2	4	BCP
Planning approval is not given to install equipment	2	4	8	Without planning approval equipment cannot be tested.	Work with Local Planning Authority to minimise risk of planning refusal.	1	4	4	BCP
Public concerns about 5G technology	2	3	6	Delay to project	Monitor EMF emissions to ensure intended 5G deployments will operate within recognised 'ICNIRP' guidelines.	2	1	3	BCP/ PHE/ PHD

List of Appendices

A: Summary of BCP Council Overview and Scrutiny Board - Call for Evidence on 5G Connectivity

B: Letter to Local Authorities from Parliamentary Under Secretary of State for Digital and Broadband

Appendix A: Summary of BCP Council Overview and Scrutiny Board - Call for Evidence on 5G Connectivity

Public Consultation Methodology

1. Following representations made to the Council, the Overview and Scrutiny (O&S) Board held an open 'call for evidence' on 5G connectivity from September and October 2019 to enable public consultation on this wireless technology. A media campaign was undertaken to publicise the call for evidence. The Bournemouth Echo ran the following article:

<https://www.bournemouthecho.co.uk/news/17898092.bcp-council-launches-5g-39-call-evidence-39/>

Officers have spoken with other areas including Bristol, the West Midlands and Brighton, all of whom are involved in 5G deployments, regarding their approach to consulting with the public on 5G. Brighton & Hove is taking a similar approach to BCP Council, otherwise it appears that BCP Council, through the O&S 5G Call for Evidence process, is at the forefront of engaging with the public on this issue. Out of 220 written responses to the call for evidence, only three respondents requested fuller consultation.

Call for Evidence Key Lines of Inquiry

2. The following broad questions were posed to respondents:

- What are the perceived benefits to the area as a result of the implementation of 5G?
- What are the perceived concerns relating to the implementation of 5G?

Although answers to these questions were invited, all responses were welcomed.

Verbal Submissions

3. Opportunity for verbal submissions was provided at a meeting of the O&S Board on 23 September 2019. Eight people registered a wish to speak, and a large number of other people attended the meeting to hear the views expressed. All members of the Council were invited to attend the meeting, in particular members of the Health & Adult Social Care O&S Committee owing to health concerns that had been expressed in relation to 5G. Speakers were provided with five minutes to provide their views, with some flexibility provided in timings and the opportunity for further questions of clarity to be raised by the O&S Board. The verbal submissions were filmed and are available to view here:

<https://www.youtube.com/watch?v=xm0D7KvMSV4>

Written Submissions

4. A total of 220 written responses were received in email and hard copy. Some respondents indicated that they were replying on behalf of others. 17 respondents were representing an organisation. The number of respondents that highlighted only concerns were 97. The number of respondents that highlighted only benefits were 48. The number of respondents that referenced both concerns and benefits were 30. The number of respondents that did not indicate any concerns or benefits but made other comments on 5G connectivity were 32. 15 respondents indicated disinterest in 5G or sent an unrelated response. Some of these also sent other advisories or comments.

Consideration of Evidence

5. The O&S Board met on 11 November 2019 to consider the evidence received. Officers from Council's Smart Place Team, the Planning Team and the Director for Public Health Dorset attended to respond to questions from the Board. The evidence, minutes and recording of this O&S Board meeting are available at <https://democracy.bcpccouncil.gov.uk/ieListDocuments.aspx?CId=292&MId=3836&Ver=4>.

Summary of Evidence, Officer Responses and O&S Board Consideration

6. Below is a summary of the key issues raised as part of the call for evidence along with responses from officers either provided as part of submitted evidence, verbal responses at the O&S Board Meeting on 11 November 2019 or subsequently researched.

- i. Concerns around health impacts:
 - a. In the written evidence supplied 54 people expressed concerns about the impact upon health of 5G technology. 4 people gave verbal evidence at the meeting on 23 September 2019. The concerns included concerns around the potential for 5G networks to cause cancer and other harm to public health, primarily due to the electromagnetic fields (EMF) generated and perceived power levels of the equipment that would be used.
 - b. O&S Board heard from the Director for Public Health Dorset that Public Health England is the statutory body responsible for health-related matters relating to electromagnetic fields (EMF) emissions and that it relies upon guidance produced by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), which is a body endorsed by the World Health Organisation. Updated guidelines from ICNIRP were due to be published in Autumn 2019. O&S Board heard that currently there was no substantiated evidence that 5G networks operating within the wireless frequencies and EMF levels specified by the ICNIRP would cause any harm to public health. Non-ionizing radiation is incapable of freeing electrons within human cells, that would otherwise give rise to concerns around potential for causing cancer. The Director added that in accordance with normal protocol, Public Health England would continue to monitor evidence relating to 5G. O&S Board discussed and resolved that the evidence provided would be sent on to Public Health England for their consideration. O&S Board also received written and verbal evidence provided by the Council officers within the Smart Place team confirming that whilst 5G networks may cause a small increase in overall exposure to radio waves when 5G networks are added to existing networks, due to the closer spacing of 'small cell' antennae, 5G networks will generally emit less energy than existing 3G and 4G networks (see technical overview at the end of this appendix). O&S Board discussed and resolved to recommend to Cabinet that if the Council's minor 5G network is approved by Cabinet that EMF emissions are continuously monitored to provide assurance that it is operating within ICNIRP guidelines.
- ii. Concerns around environmental impacts:
 - a. In the written evidence supplied 30 people expressed concerns about the impact upon ecology, such as impact upon bees and insects, 14 people were concerned with the loss of trees and 33 with the visual impact of 5G masts.
 - b. ICNIRP's guidance and EMF levels are also set to protect the environment from detrimental non-ionizing radiation exposure. O&S Board heard from Council officers that there are no plans in place for the removal of trees as part of the

Council's proposed 5G pilot. There is currently no indication that commercial deployment of 5G would require the widescale removal of tress that had been perceived by some respondents. 5G antennae are generally small cells which will be less obtrusive than masts. Any large masts will be subject to appropriate planning approval.

iii. Calls for a Moratorium on 5G

a. In the written evidence supplied 23 people requested a moratorium on the roll out of 5G. O&S Board heard that places such as Glastonbury, Frome and Totnes had all announced moratoria on 5G. It was further indicated that Brighton had recently refused permission for some 5G masts.

b. O&S Board heard about the responsibilities of the Council, in particular regarding planning. The Planning Team Leader outlined the role of the Council as the local planning authority (LPA) in dealing with planning-related issues around 5G, particularly as set out in Chapter 10 of the National Planning Policy Framework (NPPF) on 'Supporting High Quality Communications'. Amongst other responsibilities the Board heard that the Council has a responsibility to work in accordance with the Paragraph 116 of the NPPF, which states '*Local planning authorities must determine applications on planning grounds only. They should not seek to prevent competition between different operators, question the need for an electronic communications system, or set health safeguards different from the International Commission guidelines for public exposure.*' The Planning Team Leader indicated that if the Council, as the LPA, were to refuse planning on any other grounds than planning grounds it could subsequently become open to planning appeals and liable to the award of costs against it. The Board heard from the Smart Place team that as town councils, Glastonbury, Frome and Totnes are not local planning authorities. The Board were informed of the letter that the Department of Digital, Media, Culture & Sport has recently sent to Local Authorities (see Appendix B). O&S Board asked officers to investigate the reasons behind the refusal of some 5G masts in Brighton. The Smart Place Team has subsequently been in contact with the Democratic Services team at Brighton & Hove Council. They stated that refusal was based upon planning grounds only, primarily due to the siting of masts next to historical buildings and the potential impact on road safety. Brighton & Hove were clear in confirming that they did not refuse permission on health grounds as this would have been contrary to government direction and an 'ultra vires' act by the Council.

iv. Benefits of 5G

In the written evidence supplied 37 people recognised the benefits of better communications, connectivity, capacity and speeds. 32 people recognised the potential opportunity for the BCP area and that it should not be left behind. 34 people recognised the benefits that 5G would bring to business, service delivery and the local economy, including tourism, engineering, manufacturing and communication industries, healthcare and transport.

BCP Council – Technical Overview

(Written evidence submitted to Overview & Scrutiny Panel – 5G Call for Evidence)

Non-Ionising Radiated Power

Non-ionising radiation is not ionising (radioactive) radiation.

Maximum power levels for radio equipment deployment is set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) who is recognised by the World Health Organisation (WHO). Public Health England, which is the body responsible for setting health parameters for wireless radiation in the UK adopt the levels set by ICNIRP.

Legacy Cellular Networks (3G,4G) Compared to 5G

All radio devices produce non-ionised radiation and cellular networks such 4G and 5G are no different. Non-ionising radiation has the potential to heat objects. This will begin to occur at certain power levels with the heat generated increasing with a rise in radiated power - the more power radiated, the more heat is generated.

Legacy 3G/4G cellular networks have base stations deployed at strategic locations to provide coverage generally to a wider geographical area. These base stations produce power at higher (but still within defined safe) levels to allow signals to travel further and to bounce off and around objects that are in the way (buildings etc). Although the power level experienced directly in front of 3G/4G base station antenna (within 1 metre) can be high, the actual signal level received at say 6 metres is many thousands of times lower. This is one of the reasons why they are deployed at height, typically on large masts.

Cellular handsets are designed to react to signal levels being received, if the signal level is high the handset recognises that the base station is close and subsequently lowers its output power. If the received signal level is poor (due to long distance or obstructions) the handset increases its power to better reach the antenna on the base station. This means that the most non-ionising radiated power the user is exposed to in a cell-phone radio network is produced by the handset when the signal is poor, albeit still within the safe levels directed by ICNIRP.

5G devices work in the same way but the base stations are substantially different. The antennas require line of sight (no obstructions) effectively to provide much higher data speeds. Due to line of sight being required, the deployment of base stations is much denser (many more and closer to the end user handsets and devices). This means power levels are lower from the antennas than legacy 3G/4G networks as the required distance to travel is much less. This in turn also reduces the power levels being produced by 5G handsets and devices, thereby reducing the exposure to non-ionising radiation to end-users.

A wireless deployment similar to that which could potentially be deployed as a small pilot at the Lansdowne was set up on the Orkneys. The following article covers the concerns raised and the power levels detected.

<https://www.bbc.co.uk/news/uk-scotland-north-east-orkney-shetland-49401068>

Prepared by Ryan Whincop

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4th October 2019

Appendix B – Letter to Local Authorities from the Parliamentary Under Secretary of State for Digital and Broadband



Department for
Digital, Culture,
Media & Sport

INT2019/11842/DC
November 2019

Local Authority Chief Executives

5G - The Next Mobile Generation

More than any previous generation of mobile networks, 5G has the potential to transform the way we live and improve economic productivity. Networks will have the capacity for millions more devices to be connected at the same time, enabling businesses and communities to operate more efficiently. It will allow cities and communities to manage traffic flow, monitor air quality and control energy usage through real-time management of high volumes of data.

A recent report estimated that local authorities will share collectively an annual £2.35 billion of efficiency savings, from reduced social care costs for the elderly through 5G monitoring, to savings through smarter street lighting.¹ We want the UK to take early advantage of these benefits, so it is good news that all of the four main mobile network operators - EE, O2, Three and Vodafone - have started to deploy 5G networks. We expect 5G to go live in up to 50 cities and towns by the end of 2020. In order to support the deployment of 5G and extend mobile coverage, particularly in rural areas, the Government recently published a consultation on the principle of proposed reforms to permitted development rights, which closes on 4 November.

The National Planning Policy Framework ("the Framework") for England² supports the expansion of high quality communications, including next generation mobile technology, such as 5G. The Framework states that planning applications for mobile base stations should include a statement of compliance with international guidelines on limiting exposure to electromagnetic fields known as the International Commission on Non-Ionizing Radiation Protection guidelines ("the ICNIRP guidelines"³). It also states: "Local planning authorities must determine applications on planning grounds only. They should not seek to prevent competition between different operators, question the need for an electronic communications system, or set health safeguards different from the International Commission guidelines for public exposure."

Public Health England ("PHE") has recently updated its advice in respect of 5G and states: "It is possible that there may be a small increase in overall exposure to radio waves when 5G is added to an existing network or in a new area. However, the overall exposure is expected to remain low relative to guidelines and, as such, there should be no consequences for public health."⁴ I understand that PHE colleagues regularly provide

¹ "The value of 5G for cities and communities", Juniper Research and O2

² <https://d10wc7q7re41fz.cloudfront.net/wp-content/uploads/2018/03/Smart-Cities-Report.pdf>

³ <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

⁴ <https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf>

⁵ <https://www.gov.uk/government/publications/5g-technologies-radio-waves-and-health>



advice to your public health officers across a range of health topics.

In compliance with PHE advice, mobile network operators have committed to follow the ICNIRP guidelines. ICNIRP is an independent organisation which is formally recognised by the World Health Organisation. It issues guidelines on human exposure to electromagnetic fields, based upon the consensus view of a large amount of research carried out over many years. This includes the frequencies used by 5G and all other mobile / wireless technologies. Over the last two decades there have been over 100 expert reports on EMF and health published internationally⁵ with well over 3,000 studies⁶ informing these reviews and the existing scientific exposure guidelines.

Ofcom will carry out audits of mobile base stations on an ongoing basis to ensure that ICNIRP guidelines are not exceeded and publish the results of these audits on its website.

The Department for Digital, Culture, Media and Sport (DCMS) is working with colleagues in Ofcom, PHE and the network operators to provide some workshops for the benefit of council officials to help them understand the technology and the science relating to these health concerns. DCMS officials are also working with both the Local Government Association and the Association of Directors of Environment, Economy, Planning and Transport to support local authorities in this regard and would welcome any further feedback through those channels or directly.

If you or any of your colleagues have any questions, please contact DCMS at enquiries@culture.gov.uk.



Matt Warman MP

Parliamentary Under Secretary of State for
Digital and Broadband

⁵ <https://www.gsma.com/publicpolicy/consumer-affairs/emf-and-health/expert-reports>

⁶ <https://www.emf-portal.org/en>