

The Joint Committee on the National Security Strategy Inquiry: Ensuring access to 'safe' technology: the UK's infrastructure and national security

Written evidence from Mobile UK

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About Mobile UK

1. Mobile UK is the trade association for the UK's mobile network operators - EE, Telefonica UK (O2), Three and Vodafone. Our goal is to realise the power of mobile to improve the lives of our customers and the prosperity of the UK.
2. As mobile increasingly becomes the device of choice for running daily life both at home and at work, customers have come to expect more extensive coverage, more capacity and greater capabilities. Our role is to identify the opportunities for and barriers to progress, and work with all relevant parties to bring about change, be they Government, regulators, industry, consumers or citizens more generally.

Introduction

3. Mobile UK welcomes the opportunity to submit evidence to the Joint Committee's inquiry into ensuring access to 'safe' technology for the UK's 5G infrastructure and national security. Good quality mobile networks are ever more critical to the future security and prosperity of the UK. Network resilience, integrity and security are absolutely core to a mobile operator's business. This underwrites the incentive for continued high levels of investment in this area.
4. The mobile sector is capital intensive. In the last 20 years, mobile operators have in aggregate invested over £45 billion in their networks (as well as the near £30 billion paid in spectrum licence fees). They continue to invest at a rate of over £2 billion pounds per year to meet the triple challenge of upgrading the technology, increasing network capacity and extending the geographic footprint across the UK.
5. Included within the Terms of Reference, the Committee seeks views on 'the effectiveness of the Government's past and current support'. The mobile sector in the UK is funded almost exclusively from private capital (arguably, taking account of the level of spectrum fees, with a negative public subsidy). The security and resilience of their networks and services are of paramount importance for mobile operators. Mobile operators have, therefore invested heavily in network security and continue to maintain an excellent record of resilience. All mobile operators subject their suppliers to high levels of assurance. Critically the levels of security and resilience required of operators will increase further with the launch of 5G which as a technology is subject to significantly enhanced security standards which operators are well placed to meet.¹
6. Mobile operators have also made considerable strides in improving mobile coverage across the UK, delivering not only more secure networks but much more extensive networks. Operators are also fiercely competitive, which has not only provided some of the best prices, compared to international benchmarks but has also driven the engineering excellence that leads to high-quality networks for consumers.

¹ Operators would be happy to provide further detail independently and confidentially on their security provision as well as their work with the NCSC and other security services. It is to note that these have been presented in session to the Science and Technology Committee and the Intelligence and Security Committee.

- Mobile operators in the UK have now initiated or are have announced imminent launches of 5G services. The Government has set the ambition that the UK should be a leader in 5G, and the industry supports this ambition.

What is 5G?

- 5G is the next-generation network technology through which we connect to the internet on smartphones, tablets and a vast range of other web-enabled devices. 5G will be one of the critical technologies that will underpin the so-called '4th industrial revolution'. 5G will provide the central wireless infrastructure to support a host of new applications such as connected cars, virtual and augmented reality, artificial intelligence and the foundations for emerging smart city and Internet of Things (IoT) technologies.

What are the features of 5G?

- The principal features of 5G are as follows:
 - Faster download speeds:** 5G will provide much faster speeds than are achievable with today's 4G networks. 5G is expected to provide speeds between 1GBps and 10GBps. This would mean a full HD movie could be downloaded in 10 seconds as opposed to 10 minutes today.
 - Lower Latency:** 5G will also have significantly lower latency meaning very little lag (or buffering). This will enable applications that simply aren't possible today, such as factory automation and multiplayer mobile gaming.
 - Greater Capacity:** 5G will also have vastly greater capacity so that networks can better cope with not only the rapidly increasing data demands of customers today but the growth of high-demand applications being planned in the future.

Real-World Benefits – some examples

- The full extent of the possibilities that 5G will open up is still being developed, but some ideas that are already being discussed or expected are as follows:
 - IoT devices** – a wide range of connected devices. For example, O2 has found that 5G enabled tools such as smart grids and electric autonomous vehicles will save householders £450 a year through lower food, council and fuel bills.
 - Optimised services** – utilisation of smart bins and intelligent lighting could save councils £2.8 billion a year.
 - Remote health services** – the NHS could save up to 1.1 million GP hours, freed up through telehealth services (such as patient to doctor video conferencing with GPs).
 - Holographic video** – industrial equipment could be controlled remotely, helping increase worker safety, and 3D medical imaging and remote surgery could become a reality.

What are the economic benefits of 5G to the UK?

- 5G has the potential to transform UK productivity and prosperity, and several forecasters have made quantitative estimates to the future benefits of the economy, such as:
 - The Future Communications Challenge Group has estimated that the economic impact of 5G on the UK could be around £112bn in 2020 per annum, rising to £164bn in 2030,² In other words about £2,500 per head of population.
 - O2 found that by 2026, the direct economic benefits of 5G rollout will beat those of broadband

² Future Communications Challenge Group

and these would be delivered almost twice as quickly as traditional fibre.³

- The LEP Network states that early predictions suggest that manufacturing firms using 5G could see as much as a 1% increase in productivity, which if based on Q1 2018 manufacturing output could equate to an additional £1.78 billion over the course of the year.⁴
- Qualcomm estimates that by 2035, 5G will support the production of up to £8.5 trillion worth of goods and services across the world.

Investment in Network Security

12. While much of the discussion about ‘safe’ technology has centred on the role of specific vendors in the supply chain, it must be emphasised that the industry not only has obligations under Section 105 of the Communications Act 2003⁵ but has also, over a considerable period of time, invested heavily in network security and resilience which it views as of paramount importance.
13. This investment occurs both at the standard-setting level (to which UK mobile operators contribute significantly) and mobile operator level. Mobile operators take a multi-layered approach to delivering security including selection and security testing of equipment, network design, vendor mix, security monitoring and cyber defence, and mature security functions within their businesses. Critically, the hardware is not deployed on live networks until it has been proved safe in lab conditions and on test networks.
14. Concerning standardisation, [3GPP](#)⁶ states that 5G security is an evolution of the 4G standard, providing further security enhancements. 5G delivers robust features to protect customers from interception, impersonation and location tracking. As mobile operators continually build on their experience, they are also adding new 5G security tools.
15. Also, with machine-type communication, which can be enabled by 5G, widely anticipated to become a strategic difference and a selling point of 5G in the long run, further security enhancements have been made. 5G networks can serve as critical infrastructures to facilitate the digitisation, automation and connectivity to machines, robots and transport solutions. Thus, there is significant value at stake and, so too, a significantly different tolerance for risk.⁷
16. All traffic data sent on a 5G radio network will thus be encrypted, integrity protected and subject to mutual authentication (e.g. device to net).
17. Mobile operators in the UK, who have a strong record of maintaining very high levels of network integrity and security, undertake robust procurement and testing processes before deploying equipment in a live environment (in addition to the work done by the Huawei Cyber Security Evaluation Centre concerning Huawei equipment).

The Supply Chain Review and Huawei

18. In light of the future importance of 5G to the UK, it is essential that any assessment of the supply chain, and any resulting policies, take a balanced view, are evidence-based and give the UK the best chance of realising our 5G ambitions.
19. Government officials and the Cabinet Office are working closely on this issue, and it is very

³ O2 2018

⁴ LEP Network 2018

⁵ To protect security of networks and services; to notify Ofcom of a security breach and to submit to audit by Ofcom

⁶ The **3rd Generation Partnership Project (3GPP)** is a [standards organization](#) which develops protocols for [mobile telephony](#)

⁷ <https://www.ericsson.com/en/security/a-guide-to-5g-network-security>

welcome that they have engaged closely with the telecoms industry.

20. Mobile UK's contribution to the debate has been to commission a report, ahead of some operators' 5G launches, to look into the potential economic impact which would arise if any restrictions were placed on the procurement of Huawei equipment for 5G in the UK. The main findings of the report suggest that:
 - Using the Government's own estimates on the benefits of 5G, the cost to the UK economy of a limited rollout is calculated at between £4.5bn and £6.8bn
 - As well as the measurable financial impact, the UK would also suffer in terms of lower inward investment and lost productivity gains through the stagnation of digital infrastructure
21. The independent analyst firm Assembly has produced the report, and this represents a significant contribution to evidence-based and rigorous policy development on this subject.
22. The report can be downloaded from Mobile UK's website below:
<http://www.mobileuk.org/potential-risk-to-uk-economy-if-use-of-huawei-for-5g-rollout-is-restricted.html>
23. Since the publication of this report, the US has placed Huawei on its Export Administration Regulations Entity List, which has caused further uncertainty in our sector.
24. Notwithstanding this increased uncertainty, and it being desirable for any decision about the future of Huawei in the UK to be taken as soon as is practical, it is also necessary that the right decision is taken for the UK's digital future, taking all pertinent facts and evidence into account and ensuring that the future policy is based on all the relevant evidence.
25. A diverse, innovative and competitive supply chain for the UK's mobile operators is vital if we are, as a nation, to realise the full benefits that 5G.