Department for
Digital, Culture
Media & Sport

UK 5G

TESTBEDS & TRIALS

5G

the next generation mobile communication standard that is set to transform business and society

Virtualised, sliceable, core networks that enable mobile edge computing

5G Testbeds & Trials Programme

Matt Hancock
Minister of State for Digital

5G has the potential to transform communications. It will bring enhanced mobile broadband connections with considerably faster speeds. It will enable much more than phones, helping to accelerate the development of the Internet of Things. 5G will ultimately bring ultra-reliable networks with incredibly low latency so people and things can link up like never before.

The UK is at the forefront of the global adoption of 5G. The 5G Testbeds & Trials Programme will harness the power of fast changing technology and further the UK's leadership. It will make use of areas where the UK has a competitive advantage such as our strengths in scientific research, engineering talent, and rich ecosystem of relevant technology companies, both large and small. The Programme is designed to help address some of society's biggest challenges, such as those faced in health and social care, focusing on areas where the Government's role can have the most impact.

The Programme will stimulate Trials from many different future 5G users, learning lessons and driving productivity while helping to create the 5G ecosystem. The Programme will also fund projects that address deployment and technical challenges that will help to establish the conditions under which 5G can be deployed in the UK in a timely way.

This Programme forms part of our Digital Strategy[1] and 5G Strategy[2]. We are working with global partners, and with the communications regulator, Ofcom, which is preparing to make spectrum available for 5G, in an appropriate and timely way. Crucially, we will work with industry - through a new national 5G Innovation Network - to coordinate the development of 5G services and applications in the UK within a common framework, and to create the conditions for innovation to emerge in the 5G ecosystem.

This document provides an overview of why the Programme is being set up, how it will work and what it will enable.

1 https://www. gov.uk/government/publications/uk-digital-strategy
2 https://www. gov.uk/government/publications/next-generation-mobile-technologies-a-5g-strategy-for-the-uk

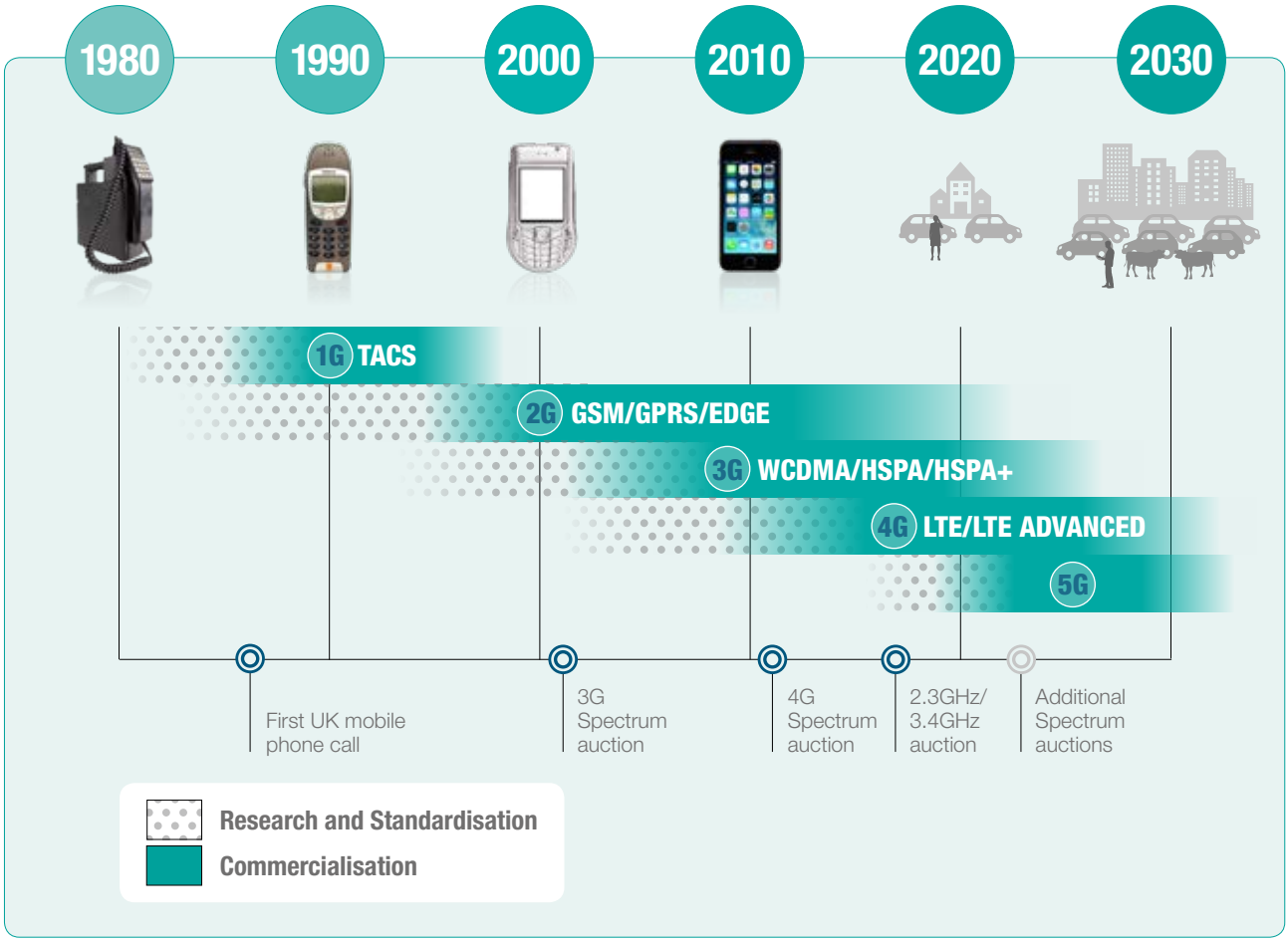
An introduction to 5G

5G is a term used to describe the fifth generation of mobile communications technologies.

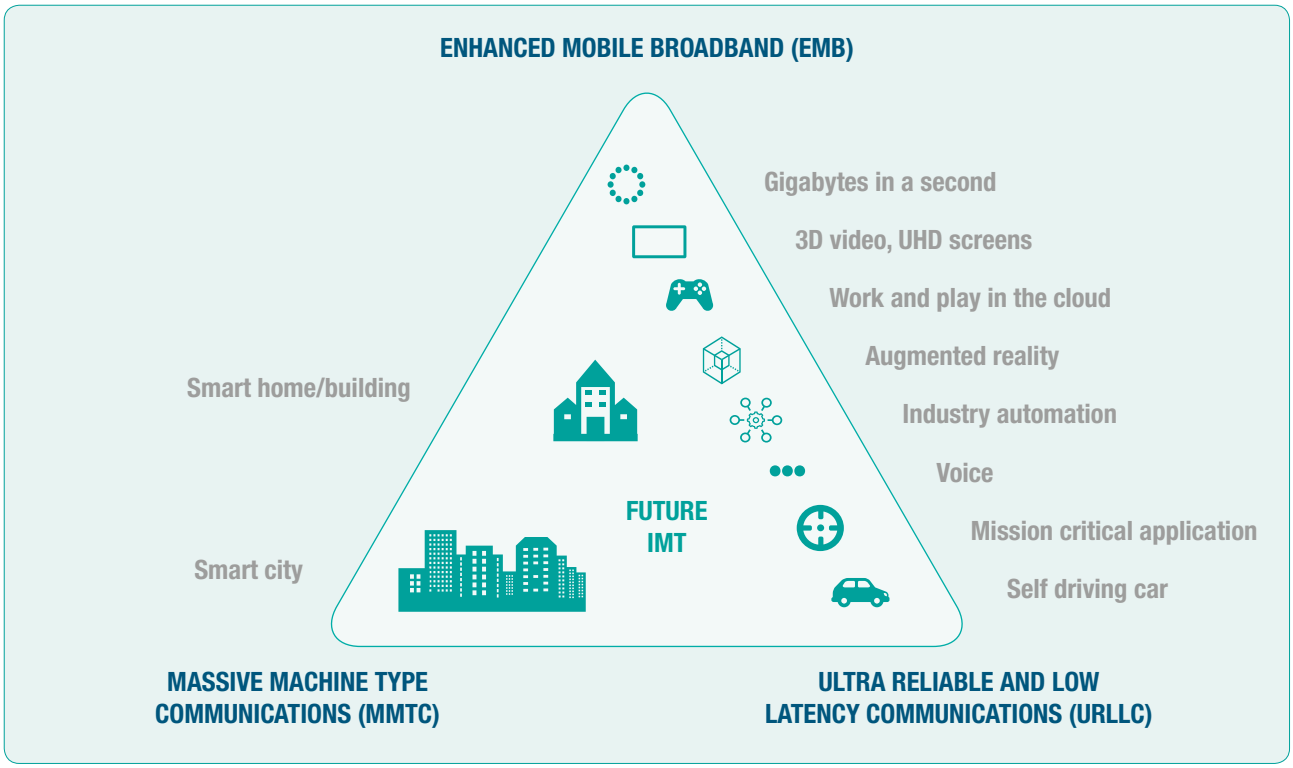
5G is not yet fully developed, with definitive standards only due to be agreed in 2019 and incremental deployment expected over the following decade. However, there is an anticipation that it will deliver a step change of ultrafast, low latency (i.e. quicker reaction times), reliable, mobile connectivity, that is able to support ever larger data requirements, as well as wide-ranging new applications. We refer to these as 'use cases'. These use cases might include autonomous vehicles; advanced manufacturing and robotics; augmented reality; smart agriculture; and smart homes and cities. 5G is not simply about faster internet connections. In fact, it is generally agreed that it will deliver the following range of different capabilities:

- enhanced mobile broadband connections;
- massive machine-type communications - between intelligent machines that require no human input (e.g. advanced manufacturing); and ultra-reliable and low latency communications (i.e. communication services which are available nearly 100% of the time).

5G – AN EVOLUTION OF MOBILE PHONE COMMUNICATIONS...



...FROM VOICE TO DATA TO THE INTERNET OF EVERYTHING



Source: International Telecommunication Union

Why is the Government supporting the development of 5G Testbeds?

The UK has lots to offer and lots to gain from the global race to 5G. Establishing a series of Testbeds and Trials focused on the testing and development of applications and products that will make use of the new capabilities of 5G should help to give the UK a competitive advantage by driving efficiency and productivity and helping to create the 5G ecosystem. We will also support projects that address deployment and technical challenges that will help to establish the conditions under which 5G can be deployed in the UK in a timely way.

The UK regulatory framework is well regarded internationally, and we are big enough to give a national programme international significance. At the same time, the UK is small and nimble enough to make it happen without too much bureaucracy. Our strengths in scientific research, engineering talent, and a rich ecosystem of relevant technology companies, both large and small, will help to create the knowledge and momentum required to move quickly. This is supported by strong international relationships and a reputation as being 'easy to do business with'5, which attracts inward investment.

The 5G Testbeds & Trials Programme will support the Government's Industrial Strategy, Digital Strategy and 5G Strategy. The Programme will stimulate trials by many different future 5G users designed to address some of society's biggest challenges, such as those faced in health and social care, and address 5G development and deployment challenges. This means requirements will be co-designed and tested by connectivity providers and end-users alike. The goal is to accelerate learning between providers and users about mutual productivity gains, including scoping new business models, in a series of pre-commercialisation test environments.

Economic case

Mobile's contribution to the global economy will be $3.9tn by 2020 – 4.2% of global GDP – according to analysis by industry body the GSMA. 1% of GDP is attributed to mobile companies; the other 3.2% is predicted to come from improvements to the general economy through productivity gains in connected industries. Based on GSMA's analysis, the impact of mobile on UK GDP will be £112bn in 2020, rising to somewhere between £164–198bn6 per annum by 2030. Enhancing UK capabilities at home and overseas will help attract inward investment and increase exports. Conversely, a significant lag in the development of new mobile capabilities would harm the UK's prospects.

3 UK ranked #7 in World Bank's 2016 '*Ease of Doing Business Index*'.
4 This figure was extrapolated to 2030 using trends forecasted from 2014 to 2020 and the variance depends on how quickly the United Kingdom deploys and adopts 5G.

The Government has a clear ambition for the UK to be a global leader in the next generation of mobile technology – 5G. Good digital infrastructure is a building block of the Government's Industrial Strategy – it creates new opportunities for growth by allowing business to be done on the move; unleashing dynamic business models; and opening up new opportunities and markets. It also supports us in our everyday lives – connecting us with friends, family and colleagues; helping us to stay safe; and giving us access to information and services that we increasingly take for granted. 5G promises a step-change in mobile connectivity with enormous potential to boost productivity and grow the economy, and we want the whole country to benefit. So we will take a leading role in its development and roll-out, putting the UK at the forefront of the 5G revolution.

Introduction to Next Generation Mobile Technologies: A 5G strategy for the UK

UK leadership position

Digital infrastructure lies at the heart of the UK's Industrial Strategy and affects every sector of the economy, with investment in infrastructure being one of the key components of the forthcoming Industrial Strategy White Paper. Within the telecommunications industry, the UK is particularly strong in operational and business systems' software design, system integration and security. Testbeds will draw on the UK's R&D strengths in these areas with the involvement of internationally recognised academics, global industry leaders and a vibrant and innovative SME sector. It will continue to proactively contribute to the European and global standards development organisations as they draw closer to agreement on 5G.

The Government, through the new 5G Centre of Expertise in the Department for Digital, Culture, Media and Sport has an important role to play acting as a convenor and coordinator.

National Cyber Security Centre

Security is a critical consideration in the widespread adoption of 5G and the National Cyber Security Centre aims to make the UK the safest place to live and do business online. Testbeds will work closely with the National Cyber Security Centre to help ensure that the development of cyber security skills and best practices grows at pace in keeping with the digitalisation of more and more of society and the economy.

Economic productivity

There is much conceptual enthusiasm for 5G today but practical know-how is still developing. Network providers and end-users need to work together on technology and business models to reap the expected productivity benefits of 5G. Countries that create the conditions for industrial partnerships to flourish should see productivity improvements ahead of those that do not. The 5G Testbeds & Trials Programme is intended to create a platform where suppliers and end-users of 5G can mature proofs of concept, begin pre-commercialisation trials and support earlier network deployment whilst attracting inward investment into the UK and helping to drive public sector efficiency benefits.

Societal benefits

Connected care for the elderly, smart-health, connected homes and cars, and improved access for people with disabilities are all examples of applications that could benefit from 5G capabilities but there are many more. They will become increasingly important in our lives at home, in education, at work, and in our travel and leisure time. People in countries with extensive deployments of 5G will be able to access more cultural activity, from enhanced media distribution to more engaging sporting events and unprecedented digital arts experiences.

How will the Programme work?

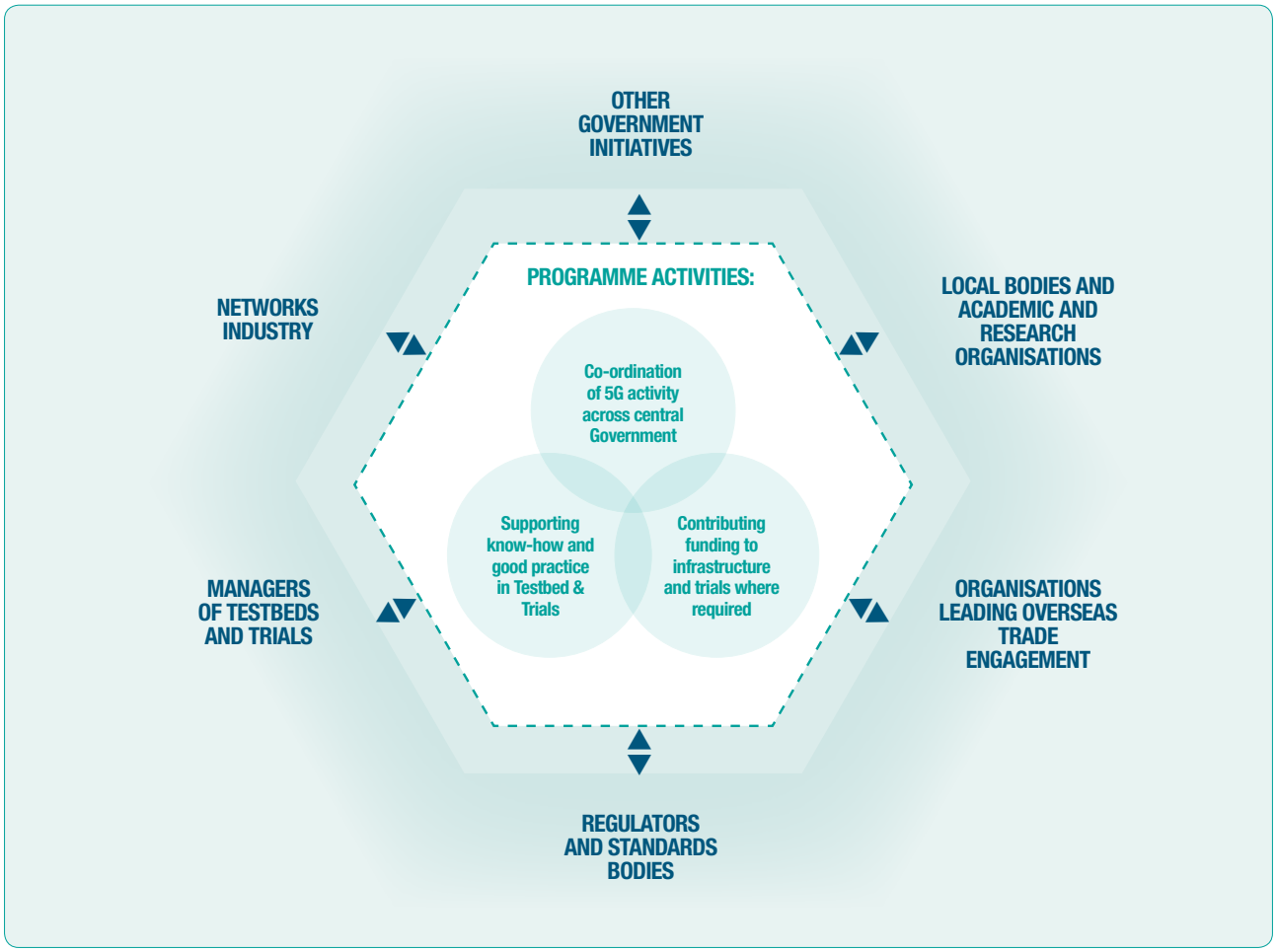
The 5G Testbeds & Trials Programme is being managed by the Department for Digital, Culture, Media and Sport, the UK Government Department responsible for digital technology and its uses.

The Programme will work with Testbeds, industry, the public sector, regulators and standards bodies, academia and organisations leading overseas trade and investment engagement to promote the development of a strong pipeline of Trials of 5G capabilities across a range of sectors. This pipeline will be a key element in driving the further development of a 5G ecosystem in the UK and will help to establish the conditions under which 5G can be deployed in a timely way to drive efficiency and productivity, and maximise the chances of the UK being amongst the leading 5G countries.

Programme funding

The Government has committed £740 million through the National Productivity Investment Fund (NPIF) to support the next generation of digital infrastructure, including this Programme and the Local Full Fibre Networks Programme. The latter Programme is aimed at stimulating private investment in networks which will provide full

5G REQUIRES NEW LEVELS OF COLLABORATION



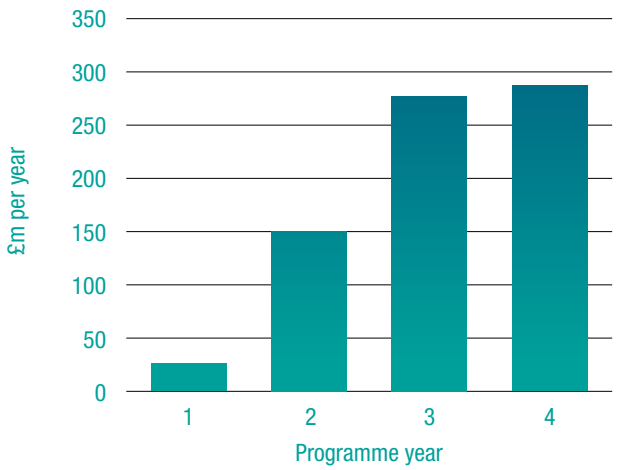
fibre broadband connections to businesses and homes across the UK, and which will also provide for greater availability of the fibre connections required for the future deployment of 5G networks. As both programmes progress, our ambition is to support joint 5G and fibre projects that explore the interplay between both technologies.

The two Programmes are running from 2017–18 until 2020–21 and the split of funding between them will be confirmed as each Programme develops. The profile of funds, shown below, will enable a steady increase in resources over the life of the two Programmes as experience, collaboration and know-how grows. Central government funding available for 5G activities will be supplemented by investment from other parties, including industry.

Putting the foundations in place

In its first year, the Programme has invested £16 million in the 5GUK project. This is a collaborative project between the University of Surrey, King's College London and the University of Bristol. The project will develop, test and demonstrate the next generation of 5G technology. It will develop a unique national asset made up of three interconnected 5G test networks that will ensure that the UK is at the cutting-edge of 5G developments internationally. This capability will also be available for use by future trials. 5GUK will be delivered by early 2018 and it is anticipated that it will support collaboration between 5G projects helping to deliver the 5G ecosystem in the UK.

FUNDING FOR 5G TESTBEDS & TRIALS AND LOCAL FULL FIBRE NETWORKS PROGRAMMES



Phase 1

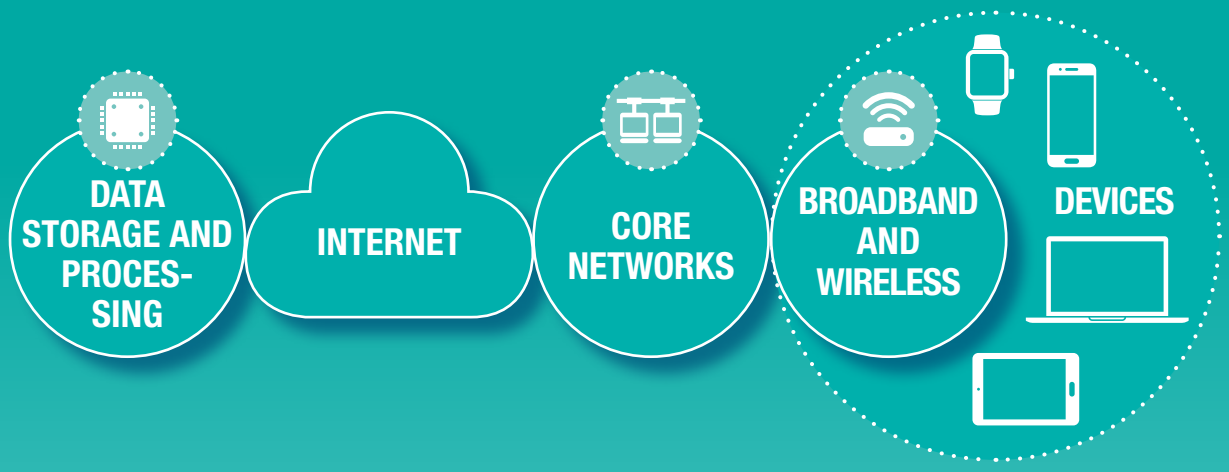
The 5G Testbeds & Trials Programme will deliver projects in phases, starting with an initial competition of £25 million for phase 1 projects. These projects will receive funding from April 2018 and will last for 12 months, though the Programme is also willing to consider a larger scale project with an extended delivery period. We have published briefing and guidance documents to support potential applicants to this competition, which set out the funding available for individual projects along with eligibility criteria and timings. The aim of this competition is to support the development of a '5G ecosystem' in the UK and contribute towards the delivery of the objectives in the UK's 5G strategy. We will do this by supporting technology and deployment trials to stimulate the development of 5G use cases and business models. Projects will explore the potential for 5G to deliver benefits for businesses; develop new 5G applications and services; develop and explore new business models around key 5G technologies; and help to reduce the commercial risks associated with investment in 5G.

Future activity

It is likely that future phases will comprise funding for additional projects that support the development of new 5G applications and services as well as large multi-year projects that seek to develop strategic partnerships between the Programme, industry and local areas. These could be focused in areas that align with the Government's strategic priorities or where we believe that there could be significant benefits to the UK. They could be focused on addressing deployment and technical challenges associated with rolling out 5G in urban and rural places, or in key verticals, including road, rail, health and social care, and security that will help to create a 5G ecosystem in the UK. More details will be published during the course of the Programme.

What is 5G?

CURRENT TECHNOLOGIES



FROM:

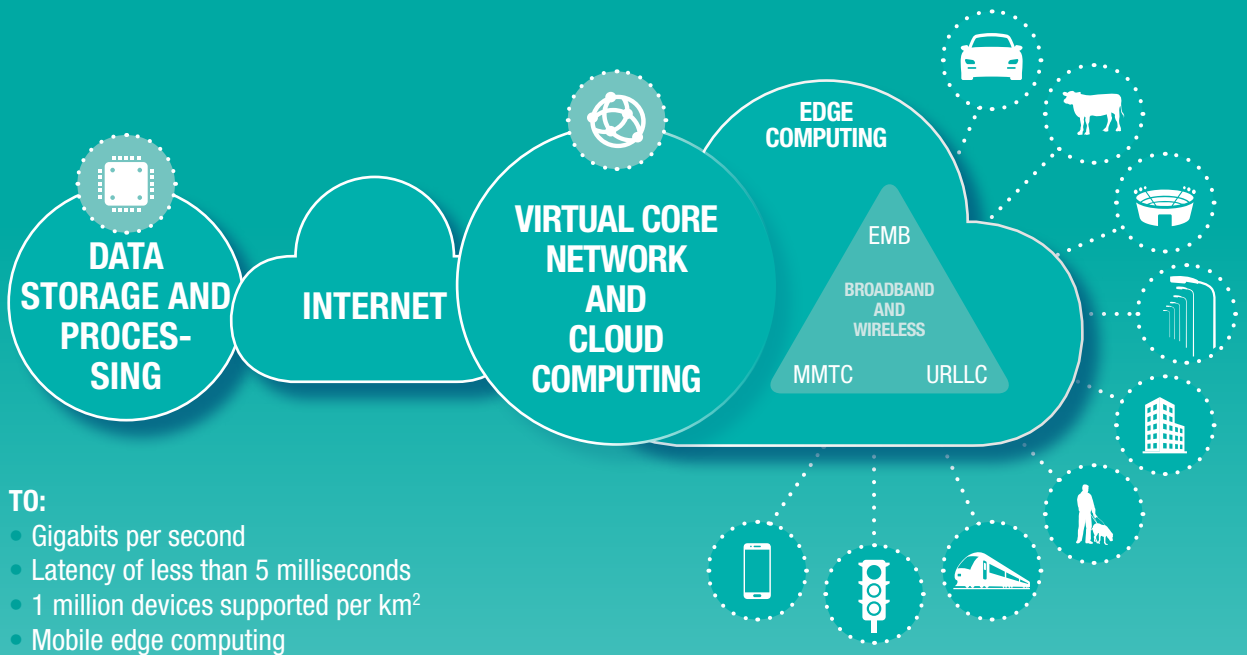
- Megabits per second
- Latency of 50 milliseconds
- Homogenous service levels

Over a generation, mobile connectivity has become a cornerstone of everyday life. One estimate is that by 2020, global mobile traffic will reach a monthly run rate of 30.6 exabytes, compared to 3.7 exabytes in 2015, a compound annual growth rate of 53%.

To support this demand, the fifth generation (5G) of mobile communications will build on and extend previous generations of mobile networks and services.
It will enable a new era of flexible high capacity connectivity, combining multiple different technology advances. 5G networks will not be one-size fits all - they can be dynamically tailored to meet the needs of the individuals or services that will use them at any moment in time, giving users all the communications capability they need, but actually sharing it with many others.

5G ultimately promises to offer peak data rates of 20 gigabits per second (20 Gbps) or more and to bring latency (the time between sending a data packet and its arrival) down to less than 5 milliseconds, resulting in a multitude of potential new applications. It will allow a million objects per km2 to communicate in support of massive development in the Internet of Things. New capabilities such as network slicing will help 5G networks become more powerful and flexible tools for communication.

5G TECHNOLOGIES



TO:

- Gigabits per second
- Latency of less than 5 milliseconds
- 1 million devices supported per km^2
- Mobile edge computing
- Heterogeneous service levels

New capabilities will create many new business opportunities and 5G will accelerate the digitalisation of many more aspects of everyday life. From industry's point of view, 5G will enable more autonomous machine-to-machine communication that will deliver greater operational efficiency. The boundary between computing and networks will be further blurred, enabling more process automation through mobile edge computing. Smart buildings, smart agriculture and health will all be able to develop more quickly. Digital urban innovation and the development of smart cities and smart regions will continue to build on the capability that 5G brings.

5G could give telecommunication service providers an opportunity to become digital service partners with the ability to offer numerous secure and customisable services. It has the potential to create new business models and competitive differentiation between connectivity providers.

Who sets the 5G standard?

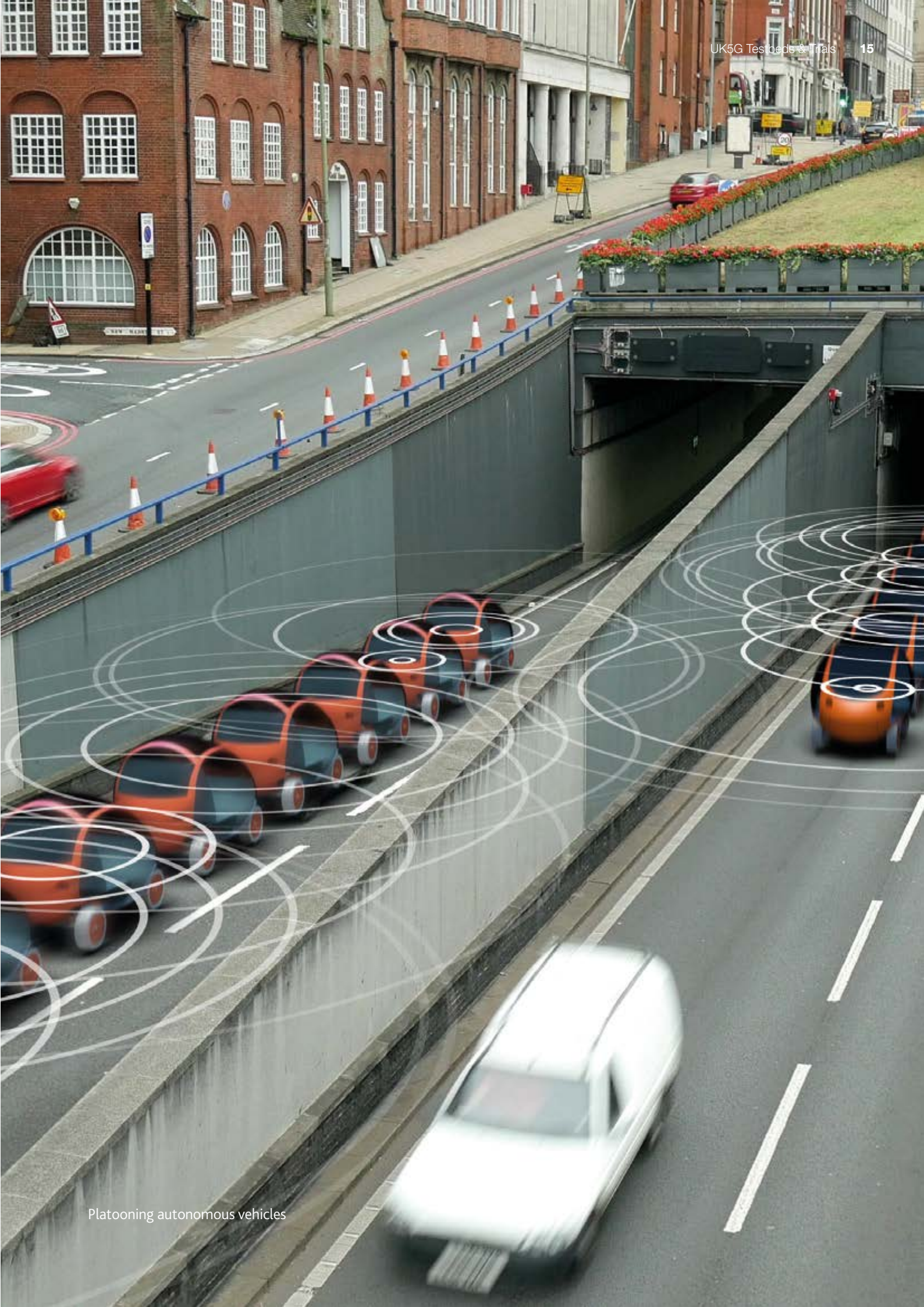
A new generation of mobile communication standards has emerged roughly every decade. Collaboration on standards is a hallmark of the ICT industry because joint working is to everyone's benefit, enabling, for example, global roaming, improved handset functionality, and other services. The rapid adoption of social media, mobile video, and the cloud based platform economy has all happened since 4G was initially conceived, giving 5G architects plenty to build on.

Standards are developed over several years by Standards Developing Organisations (SDOs). These are market led bodies, where participants from industry, academia and government bring together contributions and agree on an overall solution. The 3rd Generation Partnership Project (3GPP) brings together seven such SDOs in developing technical standards for 5G. In Europe, the European Telecommunications Standards Institute (ETSI) hosts 3GPP's technical secretariat and is the European SDO in 3GPP. Alongside 3GPP other SDOs are developing a range of standards that are part of 5G and interface to it. The International Telecommunication Union (ITU), a UN specialised agency, provides an overall description of what 5G is, called International Mobile Telecommunications 2020 (IMT2020).

Standards emerge through a combination of scientific breakthrough, aspiration, technical development and pragmatism, and there's an element of first mover advantage. It's about creating consensus - it is in everyone's interest for agreement to be reached and a new standard to emerge. The 5G standard will lead to the creation of new digital ecosystems in numerous industry verticals, each with their own nuances.

More details about the UK's engagement in the 5G standards making process and how it will benefit the UK, can be found in the *'5G Strategy for the UK'*[5].

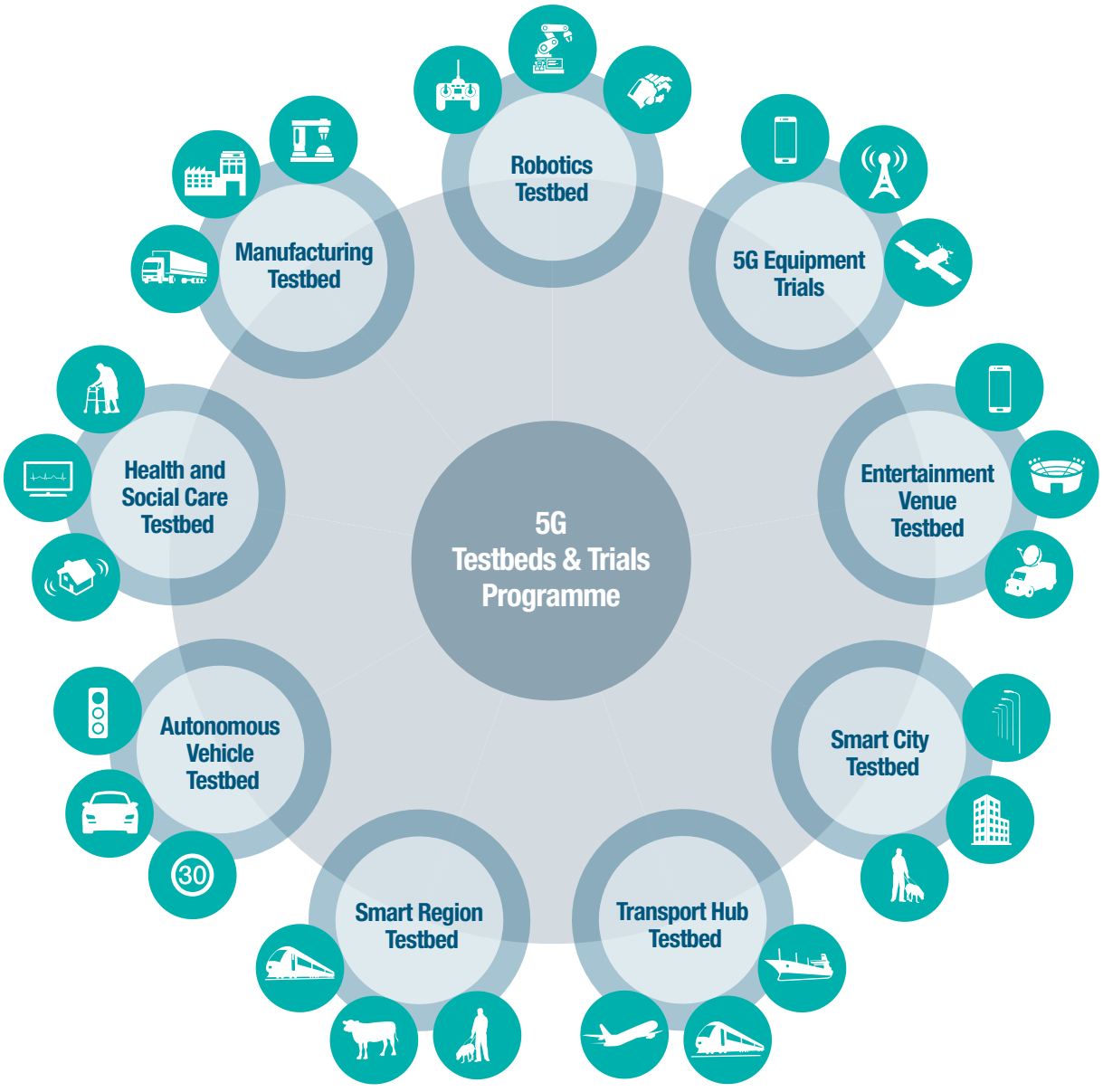
5 gov.uk/government/publications/next-generation-mobile-technologies-a-5g-strategy-for-the-uk



Platooning autonomous vehicles

5G Testbeds & Trials

Testbeds will further open up the UK's innovation ecosystem to a wide range of domestic and international companies and researchers, helping to make it easier to trial new applications and products that make use of 5G capabilities.



Testbeds are for research, development and pre-commercialisation purposes at Technology Readiness Levels 5 to 8. They will reflect the operation of a typical mobile network as far as possible.

Some Testbeds will be generic and designed to demonstrate scale and flexibility, covering applications and services in a range of sectors. Other Testbeds will have a more focused scope within a particular sector.

Projects will also include deployment and technical pilots in urban and rural areas that will help to identify and resolve issues that impact on the cost and efficiency of the future commercial deployment of 5G networks across the UK.

The Programme will lead in the selection and funding of projects, and will work together with other organisations to build on existing initiatives.

Industry, academia and places working together

Testbeds will be established in a range of areas, including urban and rural. We expect industry, local authorities and other public sector organisations to be interested in the opportunities that Testbeds could bring. Public authorities will be able to bring access to local facilities that can provide a meaningful environment for Trials to take place in. Local areas will be expected to demonstrate that they are helping to drive a supportive environment for digital infrastructure more broadly.

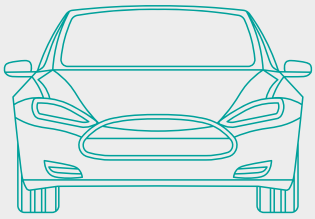
Places that have existing smart city programmes, or that have been advancing digital connectivity in creative ways, will probably be more ready to establish a 5G Testbed than others. Some places have a clear strategy to bring different funding strands and organisations together, perhaps as part of a local strategy for digital innovation. A 5G Testbed could be another important aspect of such a strategy. We will continue to work with all areas of the country.

Projects demonstrating potential productivity gains achievable by digitising a complex inter-connected system will be important. Examples might include airports, shipping ports, large sports stadiums, high value manufacturers, shopping centres, large scale logistics centres, business districts, and other hubs of economic connectivity. We also want to fund projects that could help to address some of society's biggest challenges, such as health and social care.

Who will use the Testbeds?

Two groups of organisations will make use of Testbeds: connectivity providers and their supply chains; and industry and public sectors that could uncover new ways of working with 5G capabilities. Here are some examples:

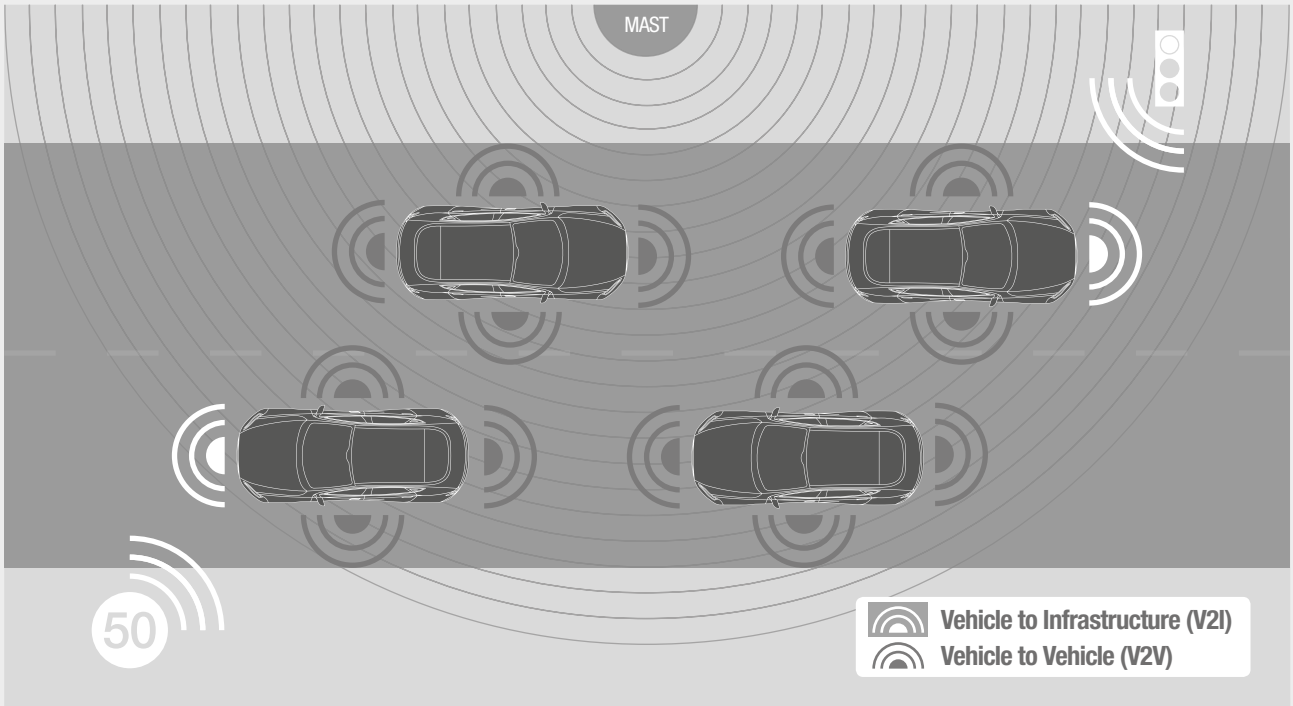
Smarter transport



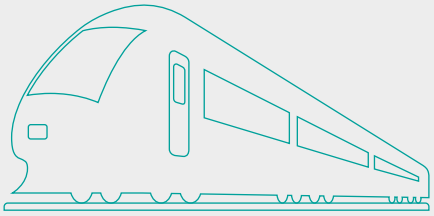
Vehicle technology is evolving quickly and has the potential to transform the way we travel. The Centre for Connected and Autonomous Vehicles (CCAV) works across government, industry, academia and internationally to keep the UK at the forefront of the development of connected and autonomous vehicle technology. The response times promised by 5G will support the requirements of connected and autonomous vehicles and we look forward to working closely with the 5G Testbeds & Trials Programme as it builds interoperability between 5G Testbeds.

Iain Forbes
Head of the UK Government's Centre for Connected and Autonomous Vehicles

The response times promised by 5G will support the requirements of connected and autonomous vehicles



Improved productivity on the railways

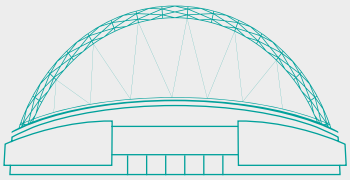


The railway has been a strategic enabler to the economic well-being of the UK since its inception. The advent of 5G telecommunication networks heralds another industrial (digital) revolution landmark in which Network Rail is keen to play a pivotal national role, testing and delivering 5G connectivity to passengers and difficult to reach regional communities. 5G will deliver speed, connectivity and capacity, adding intelligence to the railway, which in turn will have a significant and positive impact on passenger experience, rail operations, and has the potential to provide benefits to UKPLC through improved digital inclusiveness, by connecting people and communities together through rail telecommunication assets and infrastructure.

> 5G will deliver speed, connectivity and capacity, adding intelligence to the railway

Simon Atterwell
Director
Network Rail Telecom

Smart stadiums

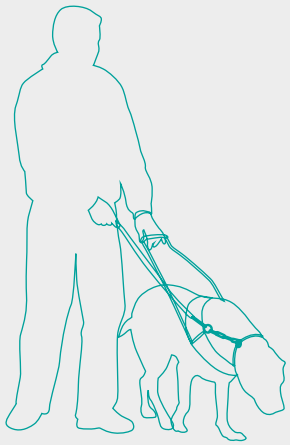


Wembley Stadium, with the support of our lead partner EE, has positioned itself at the forefront of mobile technology and innovation. It's important for our day-to-day operations and for the experience of our millions of visitors each year that we continue to evolve our mobile infrastructure and adopt 5G technologies, so we welcome the Government's 5G Testbed & Trials Programme.

Clifford Burroughs
Chief Technology and Procurement Officer
The Football Association

> Users have lots to gain from 5G and we very much welcome the Governments 5G Testbeds & Trials Programme

A revolutionary urban experience for people with sight loss



At the charity Guide Dogs we want a world where people living with sight loss can get around with confidence and freedom. Currently, visiting a new town or city can be a daunting experience for many people. While for those who never leave home on their own, it's an impossible dream.

We're determined to change this. We have been testing early stage mobile edge computing techniques, which we hope to accelerate in the UK's 5G Testbeds. The vision we're working towards is a personalised 3D urban soundscape that helps people find their way round our towns and cities, and to get contextual information about their surrounds, such as details of shops and cafes.

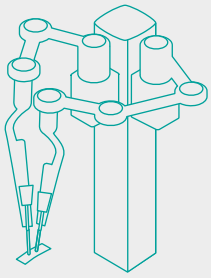
The system we're trialling enables the user to receive information about their surroundings via a device attached to their jaw bone. Wider availability of 5G will make this urban soundscape system more scalable and, alongside other mobility aids such as guide dogs, will help thousands of people living with sight loss improve the quality of their life.

The system we're trialling enables the user to receive information about their surroundings via a device attached to their jaw bone

Jenny Cook
Head of Strategy and Research
Guide Dogs

Hands-on surgical mentoring at a distance

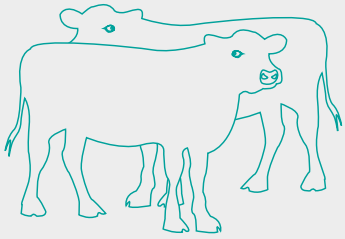
The sophistication and positive outcomes of invasive robotic surgery have increased at a tremendous pace over the last decade. The global demand for skills and expertise means that specialist surgeons in the UK now offer hands-on training and mentoring for surgeons from many different countries. 5G, with its incredibly low latency, will help us to coach new trainees in real-time, once they've returned to their home country, a bit like a driving instructor with dual controls supporting a person learning to drive.



...specialist surgeons in the UK now offer hands-on training and mentoring for surgeons from many different countries

Professor Raj Persad
Bristol Urological Institute

Precision Livestock Farming



Precision Livestock Farming is helping to satisfy the growing world-wide demand for good quality animal products and the increasing societal concerns over animal welfare and health, whilst reducing farms' environmental impact and reducing waste. Sensors typically monitor animals and transmit data to a cloud based software dashboard, alerting the farmer to real-time operational issues, as well as having capacity to notify downstream stakeholders, such as vets (about remedial actions required).

Site-specific (field) precision agriculture is now incorporating sensor technology to gather information in both crops and soil, at dense spatial level. Connected systems on field equipment and the expected and significant market emergence of fully autonomous systems will also benefit from seamless connectivity.

Connectivity and data processing increases the efficiency of the whole supply chain, and heterogeneous wireless connectivity and mobile edge computing capabilities of 5G will contribute considerably to livestock farming productivity.

> The fast-moving high growth market will help the UK's agri-food sector develop advanced technologies

Dave Ross
The Agri-EPI Centre

Universities collaborate on 5G

Britain has contributed many world-leading technology breakthroughs in the history of telecommunications. The 5G Testbeds & Trials Programme will re-enforce the UK's leadership position in the race to transform many aspects of everyday life and business, through digitisation and connectivity. We are proud to play our part alongside other universities in this Programme, aiming to build 5G capabilities that will support multiple Testbeds across the UK.

> The 5G Testbed & Trials Programme will re-enforce the UK's leadership position

Professor Rahim Tafazolli, Director
5G Innovation Centre, University of Surrey
Professor Dimitra Simeonidou, Director
Smart Internet Lab, University of Bristol
Professor Mischa Dohler, Director
Centre for Telecommunications Research, King's College London


Mobile Edge Computing


5G
INNOVATION
NETWORK
Bringing together the UK's 5G community
Academic
Standards Development Organisation
NCSC
Trial
Government
Trial
Autonomous vehicle
Regulator
Local Government
Industry Associations
MNO
Testbed
SME
Trial
Mobile Network Operator
Big vendor
Emergency Services
AGILE
Open APIs and SDKs
ORCHESTRATION
Network drivers, switches and gateways
SECURITY
CLOUD
Data management
NETWORK FUNCTION VIRTUALISATION
Applications
Future OSS/BSS
SOFTWARE DEFINED NETWORKS

What does success look like?

The Programme will contribute towards the delivery of the Government's Industrial Strategy. It will establish the conditions under which 5G can be deployed in a timely way, foster the development of the UK's 5G ecosystem and help to deliver the objectives of the Government's 5G Strategy by:

- reducing the commercial risks associated with investment in 5G
- identifying and helping to address barriers which could slow or prevent 5G deployment
- working with industry and relevant agencies to understand and overcome security challenges to ensure that users have confidence that 5G technology is safe and secure
- helping industry sectors explore the potential for 5G to deliver benefits for their businesses
- creating opportunities for UK businesses, including SMEs, to develop new 5G applications and services that they can market at home and overseas

Getting involved

You can contact the 5G Testbeds & Trials Programme Team by emailing: 5Genquiries@culture.gov.uk

The Smart Region

Glossary of technical terms

- Mobile network infrastructure can be divided into three main elements:
  - The radio access network: the network of base stations providing cellular coverage across the UK to transmit and receive data from mobile devices such as smart phones.
  - The backhaul network: the network which relays data from the base stations to the operator's core network.
  - The core network: the "intelligent" part of the network owned by each mobile operator.
- **Enhance Mobile Broadband (eMBB)** – One of three classes of 5G use cases providing higher speeds for applications such as streaming, internet access, video conferencing, and virtual reality.
- **The Internet of Things (IoT)** - A broader term for the creation of new and innovative services by the interconnection of everyday devices.
- **Machine-to-Machine (M2M)** – One of three classes of 5G use cases. A connection between devices, often wireless, where human input is not necessarily required.
- **Mobile Edge Computing (MEC)** – MEC offers application developers and content providers cloud-computing capabilities and an IT service environment at the edge of the network.
- **Network Function Virtualisation (NFV)** – The abstraction of individual network functions into a virtual layer, thereby separating the needed hardware and software. It allows the network to be built from standard servers rather than dedicated hardware.
- **Network Slicing** – 5G will allow the same network to be optimised so that it can be used at the same time for different purposes with different network requirements. This will enable a single physical network to be split into multiple virtual networks, known as 'network slicing'.
- **Spectrum** – Radio spectrum (often simply referred to as spectrum) is the range of radio frequencies over which wireless services are delivered. That includes broadcast television, radar, mobile phones and mobile broadband, GPS, Wi-Fi and any other wireless service. Spectrum is the lifeblood of digital communications and 5G will require spectrum at several different frequencies.
- **Small Cells** - Base stations send and receive mobile voice or data information. They vary in size and cost, but each requires an appropriate site with a power supply and, generally, a fibre connection. Small Cells, or Microcells, provide infill radio coverage and additional capacity where there are high numbers of users within urban and suburban macrocells.
- **Ultra Reliable and Low Latency Communications (URLLC)** – One of three classes of 5G use cases. Driven by high dependability and extremely short network traversal time, URLLC, also referred to as "mission-critical" communications, will enable industrial automation, drone control, new medical applications, and autonomous vehicles.

We can also provide documents to meet the specific requirements for people with disabilities. Please email enquiries@culture.gov.uk

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