

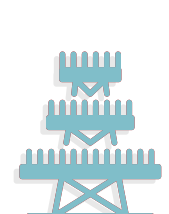
Your connected cities

Our 5G network

The future of smart cities with 5G and Internet of Things (IoT)

The UK is home to more than 20 smart cities, from London and Edinburgh to Cambridge and Cardiff. 5G will increase this number as urban planning makes the most of smart solutions for water, waste, energy and transport.

5G is the next generation of cellular network. It's supported by several emerging new technologies that, together, will unlock the potential of businesses across the country:



Massive MIMO

The number of antennas will increase more than ten-fold, which means more signal paths for sending data to customers faster



Edge computing

Data is being processed closer to the end user in local networks and devices rather than in the cloud, making response time faster and millisecond decision-making possible



Network slicing

Capacity of the 5G network can be allocated to match requirements, meaning simple devices and data-heavy demands have the right sized network slice

Smart traffic solutions

5G has the capacity to cope with huge amounts of traffic data, with smart traffic lights easing congestion and responding to ambulances needing right-of-way

Improving public safety in real-time

Emergency services using body cams, dash cams and CCTV can stream video to the cloud and to other departments without delay for protection, back-up and to triage support

Responsive roads

5G will integrate automated vehicles with their smart city surroundings, as data sees roads adapt intelligently to serve cars during rush hour and accommodate more cyclists and pedestrians during quieter times

Increased air quality

Smart air purifier systems can use real-time data on air pollution to intelligently target the parts of the city where air quality needs improving

Energy usage insights

Data from Internet of Things (IoT) sensors enabled by 5G means smart cities can better forecast energy needs, inform infrastructure spending and reduce downtime from outages

Crime control

Audio-visual sensors and analytics can come together, pinpointing disturbances and alerting emergency services

Connected communities

More than half of British homes now have at least one IoT device. With 5G, smart city residents will be able to connect thousands of devices without interference

Not all of this is possible yet – but it's not far off.

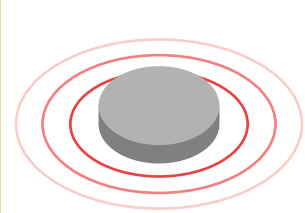
Vodafone are rolling out 5G across the UK this year, creating more efficient, sustainable and enjoyable places to live and work.

A lot of what makes this technology tick comes from IoT – and is available now:



Connectivity

In order to communicate with users and with each other, smart devices need an internet connection. This could be 4G, 5G, over Wi-Fi or with Narrowband-IoT. No matter where the devices are, there's a connection available almost anywhere.



Sensors

Sensors are the "what does it do?" part of IoT. They can take the temperature of something, measure speed and sound, detect gas and monitor vibrations.



The cloud

Made up of a huge, interconnected network of powerful servers, the cloud can be public or private, and is safe and secure. With the cloud, activity takes place over an internet connection rather than on the device itself.



IoT platform

A central platform allows for the remote management of smart devices, 24/7. What's more, with third party integration, real-time analytics can be dissected to reveal patterns and trends and identify any performance issues.

These IoT building blocks are transforming smart cities in all kinds of ways. Examples include:

Smart street lighting

- Street lamps with proximity sensors dim until movement is detected
- Informed of movements by real-time data, operations can manually brighten lamps when needed
- Movement detection data also gives a picture of footfall to inform city planning

Smart rubbish bins

- Distance sensors inside bins can detect when nearly full
- Sensors combined with AI can also sort rubbish into recycling and perishables
- Rubbish collectors can use data to better optimise waste collection routes

Smart window shades

- Light sensors open and close shades to maximise daylight over electric lighting
- Thermal window shades help regulate room temperature in both hot and cold weather
- Exterior solar panels on shades can power IoT components

Smart cities and IoT today

Vodafone's 2019 IoT Barometer report has found:

Over **33%**

of energy companies have adopted IoT

60%

of transport companies using IoT do so to measure traffic congestion and parking

58%

of retail adopters are improving the shopping environment with IoT

The future of your business

5G is here, unlocking the potential of businesses across the UK.

Discover how 5G can take your business beyond limits at vodafone.co.uk/business/why-vodafone/5g-for-business

The future is exciting.

Ready?

