

What is 5G?

AMTA

Australian Mobile
Telecommunications
Association



5G is the 5th generation of mobile networks, a significant evolution of today's 4G networks.

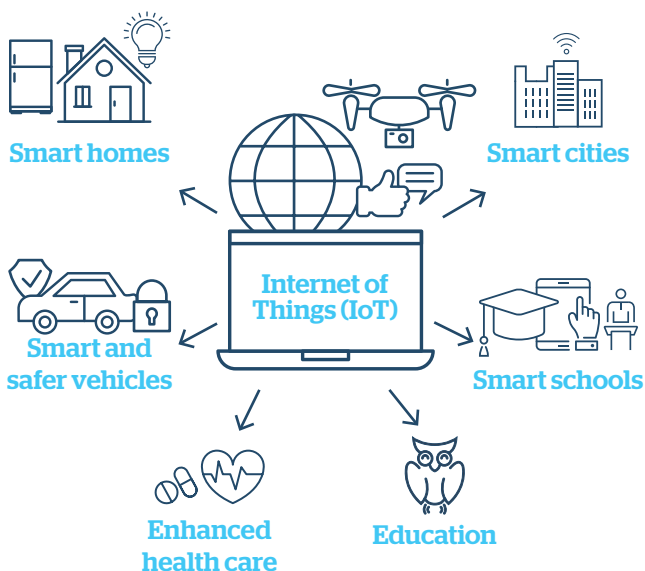
5G is designed to meet the very large growth in data and connectivity of today's modern society, the internet of things with billions of connected devices, and tomorrow's innovations.

5G will initially operate in conjunction with existing 4G networks before evolving to fully standalone networks. The rollout of 5G will help meet Australians' growing demand for more data, with the Australian Communications and Media Authority (ACMA) reporting that the volume of data downloaded on mobiles has increased by 41% from June 2017 to June 2018, and this is set to continue.

What will 5G enable?

5G will enable enhanced mobile broadband, instantaneous connectivity to billions of devices, the Internet of Things (IoT) and a truly connected world.

For communities, 5G will enable real-time connection of billions of devices to provide a safer and more efficient place to live by enabling things like:



For businesses and industry, 5G and IoT will provide a wealth of data allowing them to gain insights into their operations like never before.

Business will increasingly operate and make key decisions driven by data (e.g. parcel tracking), and innovate in different application areas including agriculture, smart farms and manufacturing. All of these will pave the way for cost savings, better customer experience and long-term growth.

5G enabled mobile technology
IS SET TO DELIVER A
\$65 billion bigger Australian economy
BY 2023

What is 5G?

What will be the first applications for 5G?

5G-enabled products such as wireless broadband, mobile devices and IoT will be the first applications using 5G.



What will 5G devices offer?

The prime benefits of 5G devices will be significantly faster speeds in data access, downloading and streaming content.

In addition, 5G devices will have increased computing power and make use of faster connectivity, meaning that the devices will enjoy virtually instantaneous connections to the network, as well as greater connectivity when on the move. 5G will enable applications such as remote monitoring, automation of production, medical monitoring and even remote surgery.



How does 5G work?

5G will deliver faster speeds, better response times and greater capacity. 5G networks are designed to work in conjunction with 4G networks using a range of macro cells, small cells and dedicated in-building systems.

Small cells will be a feature of 5G networks and will evolve to include the use of millimetre wave (mmWave) frequencies.

Small cells are mini base stations designed for very localised coverage typically from 10 metres to a few hundred metres providing in-fill for the larger macro network. Small cells will be essential for the 5G networks.

5G devices will have increased computing power and make use of faster connectivity, meaning that the devices will enjoy virtually instantaneous connections to the network, as well as greater connectivity when on the move.



5G and EME Safety

Are there safety limits for 5G?

Yes. Comprehensive international guidelines exist governing exposure to radio waves including the frequencies proposed for 5G. The limits have been established by independent scientific organisations, such as the International Commission on Non-Ionizing Radiation Protection (ICNIRP), and include substantial margins of safety to protect all people including children and the elderly at all times.

These guidelines have been widely adopted in standards around the world, including in Australia by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and are endorsed by the World Health Organization (WHO).

WHAT DO THE EXPERTS SAY ABOUT 5G AND HEALTH?

In relation to radio frequency exposures and wireless technology and health, including frequencies used for 5G, the World Health Organization (WHO) states:

“Despite extensive research, to date there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health.”

In relation to 5G frequencies, Dr Sarah Loughran, Director of the Australian Centre for Electromagnetic Bioeffects Research at the University of Wollongong states:

“The higher frequencies [of 5G] actually means that the energy doesn’t penetrate as deeply into the body than previous fourth generation and other generation technologies have.”

In relation to 5G and health, ARPANSA states:

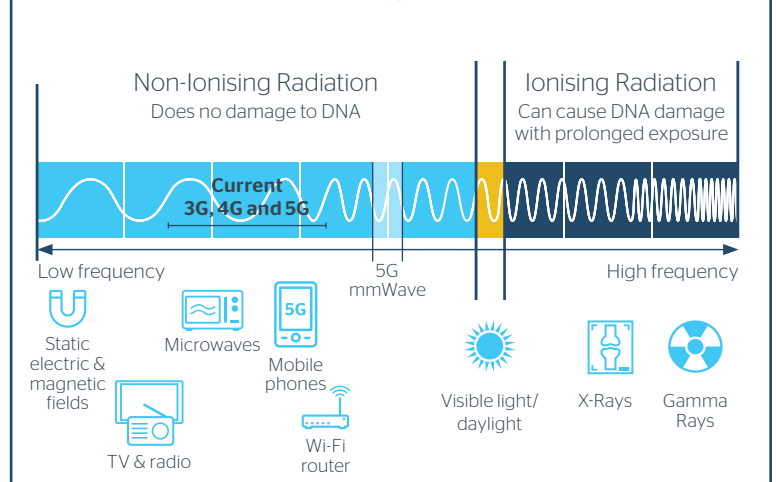
“There are no established health effects from the radio waves that the 5G network uses.”

What research into health effects has been done on 5G?



The electromagnetic frequencies used for 5G are part of the radio frequency spectrum which has been extensively researched in terms of health impacts for decades.

Where 5G fits in the electromagnetic spectrum



5G operates at a higher frequency than previous 4G networks so it can carry more data but can't travel as far. This means it will have less impact on the human body than any previous network.



Over 50 years of scientific research has already been conducted into the possible health effects of the radio signals used for mobile phones, base stations and other wireless services including frequencies planned for 5G and mmWave exposures.

ARPANSA states:

“This network currently runs on radio waves similar to those used in the current 4G network, and in the future will use radio waves with higher frequencies. It is important to note that higher frequencies does not mean higher or more intense exposure. Higher frequency radio waves are already used in security screening units at airports, police radar guns to check speed, remote sensors and in medicine and these uses have been thoroughly tested and found to have no negative impacts on human health.”

5G and EME Safety

Testing on Australian 5G networks with commercial devices in real-world settings shows levels similar to 3G, 4G and Wi-Fi, and in many cases around 1,000 times below the safety limits.



Does 5G mean higher power and higher exposure levels?

No - 5G networks are designed to be more efficient and will use less power than current networks for similar services.

The Australian Centre for Electromagnetic Bioeffects Research (ACEBR) states:

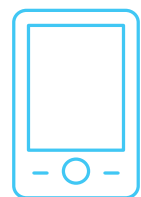
“In addition, while more antennas may be required to service areas where demand for the new service is high, users are closer to the mobile phone base station and therefore their devices can operate at a reduced power, reducing their exposure from their personal device.”

Dr Sarah Loughran, Director of the Australian Centre for Electromagnetic Bioeffects Research at the University of Wollongong, states:

“Based on the improvements in technology, the level of exposure is expected to be lower [with 5G] than what it has been in previous technologies.”

How will 5G be regulated?

All base stations including 5G equipment and devices, must comply with standards set by ARPANSA.



Where can I get more information on 5G?

Australian Communications and Media Authority (ACMA)

1300 850 115

<https://www.acma.gov.au/theACMA/a-guide-to-small-cells>

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)

(03) 9433 2211

www.arpansa.gov.au

EMF Explained web site

www.emfexplained.info

Mobile Nation 2019 - the 5G future report

<https://amta.org.au/new-mobile-nation-report-the-5g-future/>

Mobile Carriers Forum

<http://amta.org.au/mcf>



Australian Mobile
Telecommunications
Association

(02) 8920 3555

contact@amta.org.au

www.amta.org.au