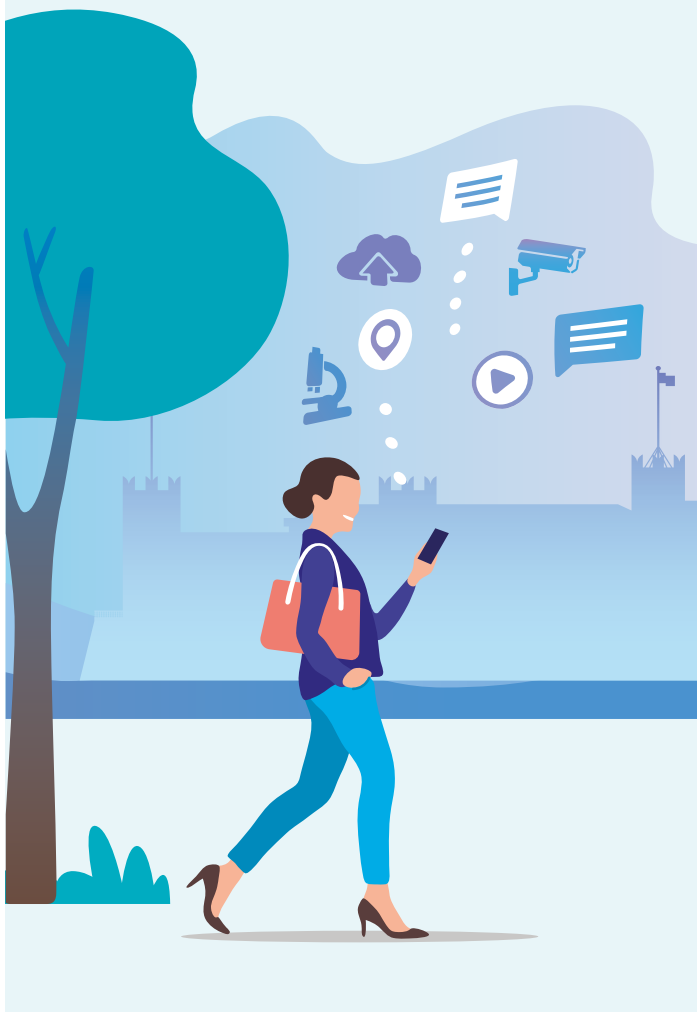




Gouvernement Princier  
PRINCIPAUTÉ DE MONACO

# User Guide to 5G



# Why is 5G coming to Monaco?

5G is the fifth generation wireless technology for digital cellular networks. It is being rolled out worldwide, after 4G. This new technology takes all the advantages of previous generations and builds on them, delivering the ability to transfer much more data, much more quickly, while using less energy.

5G is for the benefit of all (both private individuals and professionals). The technology will help resolve the problem of network saturation, guaranteeing optimum use of phones and mobile internet, and paving the way for new applications in a host of fields, such as health, urban planning and the environment, smart buildings, transport, media and entertainment, smart personal services, energy transition, etc.



# How will 5G benefit you?

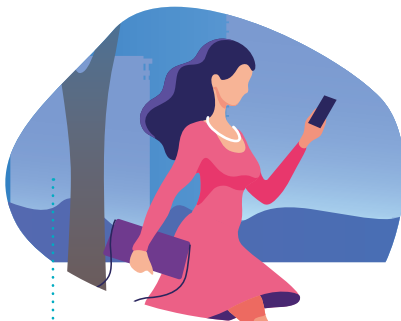
5G will gradually take over from 4G, and its enhanced performance will allow many improvements:

- Faster (ten times faster than 4G)
- More reliable
- More applications, including:



## E-Health

New remote healthcare services mean patients can be treated or monitored directly without leaving their home, particularly for chronic illnesses.



## Entertainment

Enjoy smooth streaming of TV shows or movies on the go, on your telephone or tablet, in Ultra High Definition.



## Smart buildings

Optimised management of energy use in buildings is now possible, with devices connected directly to sensors and meters.



## Safety

With 5G technology, users can check out destinations before they travel, for example, while first responders will soon be able to report back information about their condition while in the field.

# How does 5G work?

Like all wireless communications, 5G uses radio waves or radio frequencies to send information between devices.

**In the Principality, 5G is being deployed on frequencies similar to those used for 4G and Wi-Fi.**

5G can also be deployed on higher frequencies (millimetre waves), but these are not used in Monaco.

Unlike 2G/3G/4G, which transmit signals constantly across the entire space covered by their beam, the new 5G antennas only transmit in the direction of the devices connecting to them. This makes them much more energy efficient and avoid radio waves dispersion.



# Will 5G affect my health?

No. Radio waves have been used since the early 20th century to transmit signals (radio, television, mobile phones) and for remote detection (radar). They are present in our environment at all times.

At high levels of exposure, these waves can cause matter to heat up. Wireless communication systems such as 5G are far below the power needed to produce this heating effect. This is the same phenomenon used to cook food in a microwave oven.

Over the last thirty years, thousands of scientific studies have been carried out to identify any potential (non-thermal) low level effects.

Health authorities and institutions around the world analyse this research regularly. Their conclusions are unanimous. **Their conclusions are unanimous. Radio waves have not been found to have any negative impact on health at the levels of exposure generated by wireless communications, and in particular mobile telephone networks.**

**In the Principality, there are regulations in place limiting the levels of exposure. These limits are well below the thresholds admitted among neighbouring countries.**

*For more information, visit the World Health Organisation (WHO) website:*

*<https://www.who.int/fr/news-room/fact-sheets/detail/electromagnetic-fields-and-public-health-mobile-phones>*



# What are the regulations governing electromagnetic waves for 5G in Monaco?

Monegasque regulations limiting public exposure to electromagnetic waves already cover the frequencies used for 5G (Sovereign Ordinance n°3,020 of 26 November 2010).

They impose a global limit of 6 V/m (volts per metre) on average for all radio frequencies, and a second, lower limit of 4 V/m for mobile phone public networks (2G, 3G, 4G and 5G). This limit is increased to 6 V/m for public areas inside buildings.

It is more restrictive than the limit recommended by the European Union\*.

The EU limit is based on the values recommended by the International Commission on Non-Ionizing Radiation

Protection (ICNIRP), which are used as the benchmark for the WHO.

The Smart Nation Department of the Monegasque Government is responsible for enforcing the regulations. It takes regular measurements across the Principality, focusing particularly on schools, healthcare institutions, and retirement homes. All of the results of these measurements can be viewed on the website [cartoradio.mc](http://cartoradio.mc), which also shows the location of every mobile telephone and FM radio transmitter site in Monaco. The website will soon be updated with an electromagnetic map of public spaces in the Principality.

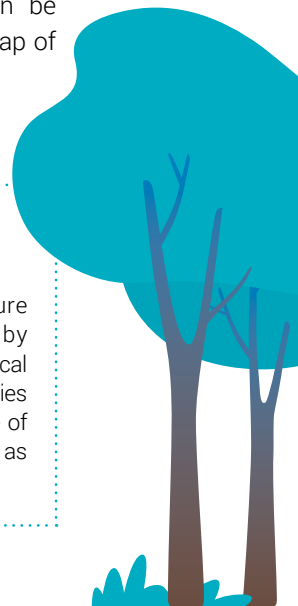
## Maximum permitted values for ambient radio frequency exposure

<i>EU Recommendation</i>	<i>28 to 87 V/m</i>
<i>Monegasque Regulation</i>	<i>4 and 6 V/m</i>

## How is the ambient electromagnetic field measured?

On the ground, the level of exposure to radio frequencies is obtained by measuring the intensity of the electrical field, in volts per metre (V/m). This varies depending on the power and distance of the emitter, and falls away very quickly as the distance increases.

\* European Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)  
<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31999H0519>



# FAQ

## ➔ ***If there are more antennas, will I be exposed to a stronger electromagnetic field?***

Field strength may increase slightly in places, but the waves emitted by multiple antennas do not stack, and so the ambient electromagnetic field will remain very low. This is also true for smart devices used in the home.

## ➔ ***Will my mobile phone emit more powerful waves?***

The phone will emit only what is needed to reach the nearest antenna. The closer the antenna, the easier communication becomes, and the fewer waves the phone emits.

Smartphones (3G, 4G, 5G) emit less than 2G phones when communicating. This is because they do not need to emit more radio waves as they switch from one antenna to another when the user is on the move.

## ➔ ***Do current regulations also protect children?***

Like EU regulations, Monegasque regulations are designed to protect the entire population, including children, pregnant women and the most vulnerable.

## ➔ ***Is 5G dangerous for my health?***

5G uses radio frequencies, like previous generations of wireless technology. A thorough analysis of all scientific research on this issue shows no risk to health.

## ➔ ***Will trees need to be cut down to make way for 5G infrastructure?***

No trees need to worry! This idea comes from a rumour started by a faked image circulated on the social networks. As for 2G, 3G and 4G, no trees will need to be cut down for 5G technology.

