



Budapest, 25 September 2018

Vodafone 5G at the Internet Hungary **Vodafone performed a live video broadcast online via a 5G trial connection**

At the year 2018 Internet Hungary conference Vodafone presented the future: the telecommunications company broadcast live, online video content via a 5G trial network for the first time in the country, streaming it onto the world-wide-web in HD quality. The connection was established on the 3.5GHz frequency band, where currently Vodafone Hungary is the only mobile operator in Hungary to own a frequency spectrum suitable for the provision of commercial 5G services.

Vodafone Hungary was the first operator in Hungary to test broadcasting live, online video content via a 5G network. Through this, the Company took the country one step closer to a future where, thanks to self-driving cars that will communicate with each other there will be a significant improvement in traffic safety, doctors will be able to operate remotely, an art or sports event will be possible to watch from several camera angles and views with less latency, and, owing to virtual and augmented reality, learning will become more interactive and efficient than ever before. 5G will bring about the most significant changes in internet of things communication, as it will facilitate the connection of significantly more devices than currently, plus remarkably faster and with super low latency.

Vodafone Group has taken a leading role in international developments and tests linked to 5G: in February Vodafone Spain was the first operator in the world to successfully establish a 5G call. Since then, Vodafone has also started numerous trials in markets including Italy, the United Kingdom and Germany.

Vodafone Hungary presented the capabilities of the next generation of mobile networks on 25th September 2018, at the Internet Hungary conference. The content of the HearthStone Hungarian Cup conducted in the Budapest Head Office building of Vodafone, organised by Esport Universum, was edited and commented on in real time in the on-site studio in Siófok, following which the broadcast was uploaded to the world-wide-web using a trial 5G connection, where audiences could follow the live, HD-quality video stream via the Twitch platform, on the Fusion TV channel. Dr. Monika Karas, President of the National Media and Infocommunications Authority, Amanda Nelson, CEO of Vodafone Hungary, Dr Károly Balázs Solymár, Deputy State Secretary responsible for Infocommunications at the Ministry for Innovation and Technology and Dr. Gergő J. Budai, Director of External Affairs at Vodafone Hungary have also been present to witness this technological milestone.

At its first 5G demo presented to the general public, Vodafone used a standalone test core network, i.e. one that's independent of the existing 4G network, as well as a 5G modem and base station

fitted with an active antenna. The essence of the active antenna (also known as 'massive MIMO') is the ability to focus the signal into a more precise set of layers making transmission more efficient. These layers can bring more capacity than current 4G systems with the same bandwidth. This radio device, fitted with the active antenna, secured the 5G connection via the 3.5GHz frequency range for the network modem, to which the video server was connected. In the future, with the introduction of 5G, the same solution, i.e. the live broadcasting of HD-quality videos, will be possible to use not only at sporting events but even in ambulances, allowing hospital diagnostics to take place during the patient's transportation to the hospital. These features will require all the unique characteristics of 5G networks, such as super low latency, very high reliability, as well as much higher capacity and transmission speed.

By recently presenting the smart parking solution, which uses the narrow-band IoT network (NB-IoT), and by creating a live 5G network today, Vodafone, within a very short space of time, took two very important steps on the road to supporting Hungary's digital development.

'Today we brought the future closer. The future we call Gigabit Hungary. Vodafone will continue to take an ever-larger share in turning the country into one of the top 5 most competitive economies within the European Union and to this end dynamically continues with its Hungarian network developments.' – explained Amanda Nelson, CEO of Vodafone Hungary at the demo of the live 5G network.

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About Vodafone

Vodafone Group is one of the world's largest telecommunications companies and provides a range of services including voice, messaging, data and fixed communications. Vodafone Group has mobile operations in 25 countries, partners with mobile networks in 46 more, and fixed broadband operations in 18 markets. As of 30 June 2018, Vodafone Group had 534.5 million mobile customers and 19.9 million fixed broadband customers, including India and all of the customers in Vodafone's joint ventures and associates. For more information, please visit: www.vodafone.com.

Vodafone Hungary Zrt. launched its Hungarian operation on November 30, 1999. Vodafone Hungary is an integrated technology provider, with a portfolio covering mobile communication, mobile Internet and broadband data services for retail and business users alike.