



Vodafone's 5G 8x faster than 4G in Spain

MedUX is conducting walking and light drive tests to gain an independent view to find out about 5G data connectivity promises. In this post, we focus on 5G network performance compared with that of 4G in the city centre area of Madrid.

Discover what early 5G deployments can offer thanks to MedUX 5G field measurements in Spain!

Our findings confirm significantly higher speeds, lower latency and jitter for the Vodafone 5G network in contrast with that of 4G:

- Download speeds are eight times faster, with download peak rates rising to 950 Mbps and average values of 670 Mbps.
- Upload speeds are tripled, with average values of 61.5 Mbps and upload peak rates reaching 80 Mbps.
- Latency gets 32% lower with 29.1 ms on average.

About MedUX

MedUX is the next generation specialist in customers' digital-experience measurement and improvement, providing cutting-edge tools and innovative solutions for telecom operators, governments and companies. The company is present in more than 15 countries, with a strong presence in Latin America and Europe. Today, MedUX has been deployed for clients such as Telefónica, AT&T, Claro, Vodafone and Orange, among others.

Our innovative system for the measurement, prediction and analysis of fixed and mobile telecommunications lines obtains reliable, real-time data on operators' networks and the quality of service offered. This enables our clients to stand out from their competitors, reduce costs and enhance their value propositions, keeping their customers happy and satisfied by anticipating problems and avoiding complaints.

Go beyond measurements and analytics, discover MedUX!

Fly with Data!



Source: MedUX's field measurements during January and February 2020

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Using Huawei 5G phones – specifically, the **Huawei Mate 20 X 5G** – our network test team monitored 5G performance during several measurement days in January and February 2020 in strategic locations. As a 4G crosscheck, we also used CAT16 and CAT18 smartphones for 4G measurements.

5G Network in Spain

Spain is one of the first European countries that had an ultrafast 5G network with Vodafone's launch in June 2019 in collaboration with Huawei and Ericsson. To date, Vodafone is still the only operator that has rolled out the 5G service, while its competitors Telefónica, Orange and MásMóvil apparently are not set to unveil theirs until 2020 or even 2021.

The network is using 90 MHz bandwidth of the 3.7 GHz band obtained in Spain's 5G auction in July 2018 (198.1 million EUR bid for 18x5MHz). The current spectrum available to Vodafone is close to the 100 MHz of the contiguous 5G spectrum, referred to as 'true' 5G, according to the ITU. It will be interesting to see what happens with the forthcoming 700 MHz 5G spectrum auction in Spain, supposedly in May this year. The 694MHz-790MHz (700MHz) spectrum is being utilised for Digital Terrestrial Television (DTT) services but will be freed up by the end of next month.

We note that Vodafone launched a Non-Stand Alone (NSA) 5G service according to the specifications of the 3GPP NSA standard. According to Vodafone statements, customers would experience download speeds of up to 1Gbps and shortly up to 2Gbps.

Madrid, Barcelona, Seville, Malaga, Bilbao and Valencia are some of the 15 cities in which Vodafone has already launched 5G. Service coverage and availability are expected to be expanded to many additional cities throughout the year.

In this sense, the State Secretariat for the Information Society and Digital Agenda elaborated a 5G National Plan to successfully introduce the new technology and 'place Spain amongst the most advanced countries in developing this new technology so that, by the time 5G reaches its technological and commercial maturity point, Spain may be ready to harness all the opportunities arising from this technological paradigm'.¹

¹ https://avancedigital.gob.es/5G/Documents/plan_nacional_5G_en.pdf

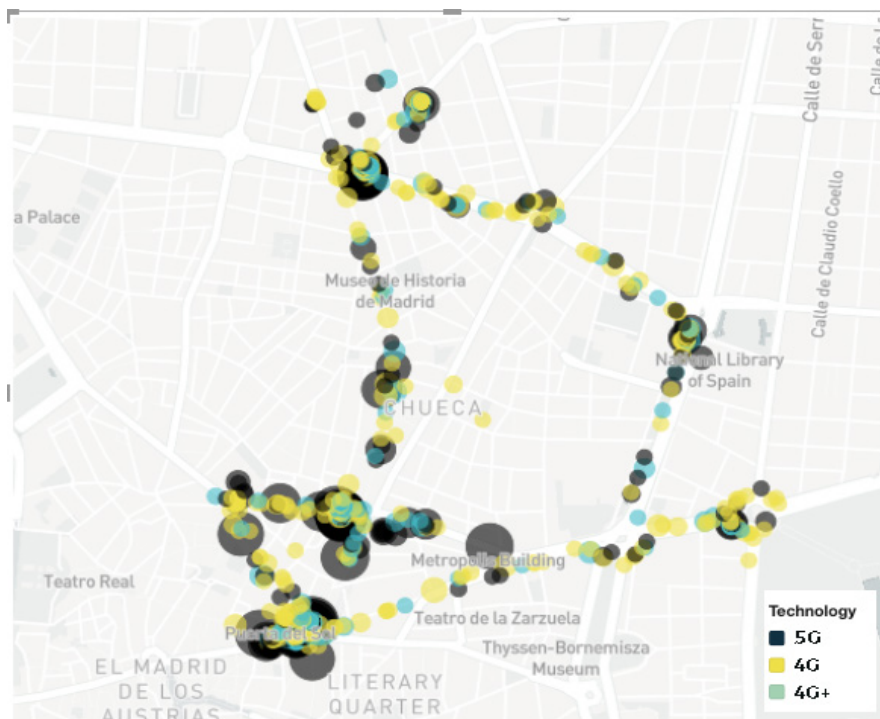


5G performance boost with significantly higher speeds (8x) and lower latency (-32%)

According to MedUX measurements, Vodafone's 5G download speeds averaged around 650Mbps. The download peak rates rose up to 950 Mbps, very close to 5G promises for current 5G NSA deployment. This means that an end user could download a Full HD film (approx. 6GB) in around one minute, compared to over 11 minutes on 4G. Vodafone's 4G speeds tend to average around 80Mbps and reach a peak rate of around 260 Mbps, based on our recent statistics.

In the scope of this study, we measured 5G in strategic locations in the city: Puerta del Sol, Gran Vía, Glorieta Bilbao and Plaza de Colon, where our download speed tests hit 671 Mbps, 743 Mbps, 717 Mbps and 492 Mbps, respectively. During the measurements performed across the main streets of Madrid's city centre, 5G was available 77% of the time on average, being the lowest in the farthest areas from strategic network locations.

Figure: Overview of Technology and speed performance measurements. The blue spots mark 5G areas, and the size of spots reflects download



Source: [MedUX](#)



Notably, these speeds were measured on a low-congestion network. Average 5G download speeds are expected to be close to 150-200 Mbps, according to Vodafone statements. Based on preliminary estimates, performance is heavily affected indoors due to the high spectrum band currently in use. This would improve with the use of the 700 MHz band after the forthcoming Spanish auction.

Vodafone's 5G upload speeds also improved, but to a lesser extent. The maximum 5G upload speed averaged 61.5 Mbps in contrast to 21.3 Mbps in 4G.

Regarding latency, which is understood as how long the network takes to respond to a request, 5G gets as low as 29.1ms on average, while on 4G networks, it is 42.8ms. The 5G jitter averaged 8.5 ms, compared to 14.4 ms in 4G. In addition, 5G latency and jitter average values show a 32% and 41% reduction, compared to 4G. These are relevant improvements benefitting online gaming and video streaming with real-time requirements, but still far from 5G promises of enabling ultra-reliable low-latency communication use cases.

5G context and MedUX benefits

The industry has high expectations for 5G, with the most important use cases falling into three categories: enhanced mobile broadband (eMBB), ultra-reliable low-latency communication (URLLC) and massive IoT (also known as massive machine-type communications).

To deliver all the 5G promises, telecom operators and other stakeholders not only must overcome new technology challenges, but also ensure the right experience according to end users' expectations.

With initial 5G deployments focusing on eMBB, it is essential to test and monitor the performance from a customer perspective. MedUX cost-effective, plug-and-play and smartphone-based testing solutions can be used for 5G benchmarking, quality assurance, real-time performance monitoring, optimisation and planning.

MedUX helps operators prioritise investments and upgrades, not only based on technical network indicators, but also on expected impact on network quality and Quality of Experience (QoE). Among other things, we support the identification of the strategic location of stations and radio equipment in high-density areas.



While you're here, why not also take a look at the live demonstration of our cost-effective light drive testing solution to benchmark, monitor and improve mobile networks. MedUX Light Drive Testing aims to improve Customer Experience and satisfaction while testing and understanding mobile services from the end-user's perspective. It will help telco operators reduce churn rate, enable cost savings, support prime revenue streams and have a positive impact on brand perception and differentiation.

MedUX light-drive test in Madrid



Source: [MedUX](https://www.medux.com)

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