



TUTELA 

Colombia

State of Mobile Networks

Analysts

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JULY 2020

Annual Report

www.tutela.com

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Introduction

Amid the last few months of uncertainty, connectivity services have proved essential in continuing to connect businesses and individuals alike. While many other industries slow down, mobile operators press ahead to upgrade mobile experiences for its subscribers. In Colombia, for example, Tigo recently deployed 700 MHz spectrum in the country to better bring 4G connectivity to at least 1,600 new locations(1).

This follows a spectrum auction in December 2019(2) where Tigo and Claro both obtained spectrum in the 700 MHz band, and 30 Mhz of 2.5 GHz spectrum was awarded to Claro. And despite 5G deployment taking a backseat in some countries over the past few months, it's

anticipated that Colombia will still deploy 5G in 2020 along with Brazil, Mexico, Argentina and Chile, according to Ericsson's latest Mobility Report(3). Indeed, the first 3.5 GHz 5G pilot in Colombia began in May, conducted by Movistar and Huawei. As more consumers get connected, and demand rises for faster, more seamless mobile experiences, 5G will become increasingly fundamental to deliver the mobile experiences users expect.

In this report, Tutela has evaluated over 1 billion records in Common Coverage Areas across Colombia, including more than 14 million speed tests and 212 million latency tests, collected between December 1, 2019 and May 31, 2020.

(1) Telecompaper, Tigo-Une activates first 700MHz antennas in Colombia

<https://www.telecompaper.com/news/tigo-une-activates-first-700mhz-antennas-in-colombia-1335800>

Retrieved 22 June 2020

(2) Finance Colombia, Colombia Auctions Mobile Spectrum To 3 Bidders For \$1.5 Billion USD

<https://www.financecolombia.com/colombia-auctions-mobile-spectrum-to-3-bidders-for-1-5-billion-usd/>

Retrieved 22 June 2020

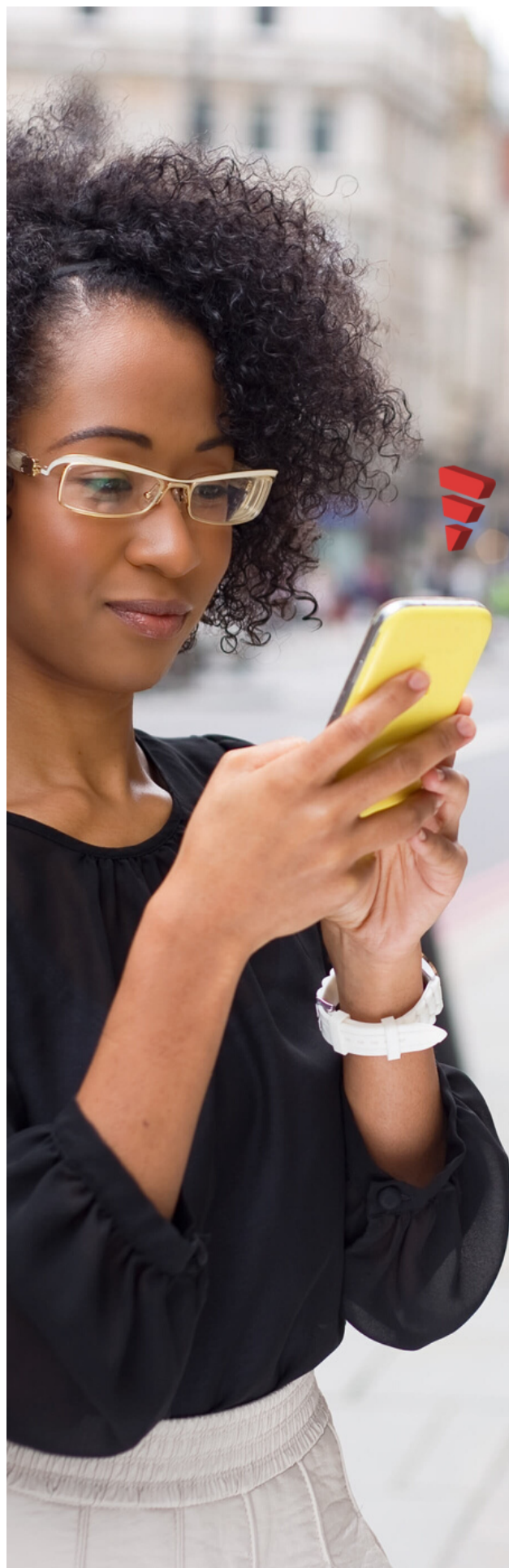
(3) Ericsson, Ericsson Mobility Report

<https://www.ericsson.com/49da93/assets/local/mobility-report/documents/2020/june2020-ericsson-mobility-report.pdf>

Retrieved 22 June 2020

Key findings

- Colombia's networks proved incredibly competitive, with all four national providers appearing on the leaderboard in at least one category. Tigo had the highest Excellent Consistent Quality percentage and the best one-way latency result in Colombia, while Claro took the award for fastest median download speed, and Avantel lead for median upload speed.
- Movistar had the highest Core Consistent Quality percentage in the country at 92.9%, despite its third place ranking in the Excellent Consistent Quality.
- Avantel SIM users demonstrate more time on 4G networks, with the other three providers showing less than 70% of time on 4G technology. However, while 4G connections usually outperform 3G ones, it is notable that Avantel still places last for download speed.



Results overview

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Mobile experience results

Colombia, July 2020



Excellent Consistent Quality	★ Winner			
Core Consistent Quality		★ Winner		
Download throughput			★ Winner	
Upload throughput				★ Winner
Latency	★ Winner			

Results from over 1 billion records in Common Coverage Areas across Colombia, collected between December 1, 2019 and May 31, 2020.

"Tigo delivered the highest percentage of Excellent Consistent Quality in Tutela's tests"



Based on the highest Excellent Consistent Quality in Common Coverage Areas.

Understanding this report

Tutela uses two key methodological components to best compare user experience across operators: Consistent Quality and Common Coverage Areas. Consistent Quality is a set of metrics that Tutela has developed to objectively evaluate when networks are (and are not) enabling users to do almost everything that they want to do on their smartphones.

The methodology is covered in detail at the end of this report and [on our website](#), but simply put, there are two sets of thresholds, Excellent and Core. A connection that hits the Excellent threshold is sufficient for use-cases like 1080p video streaming or multiplayer gaming, while a Core connection will stream standard-definition video or handle things like web browsing or uploading photos to social media. The percentages you see in this report represent the percentage of tests on a given operator that were above the Excellent or Core thresholds. These were most recently re-assessed and updated September 1st, 2019.

Common Coverage Areas are parts of the country where the majority of operators offer service. In this report, we present results nationally and from Common Coverage Areas, which helps present both a full national picture, as well as highlighting network conditions wherever operators are directly in competition.



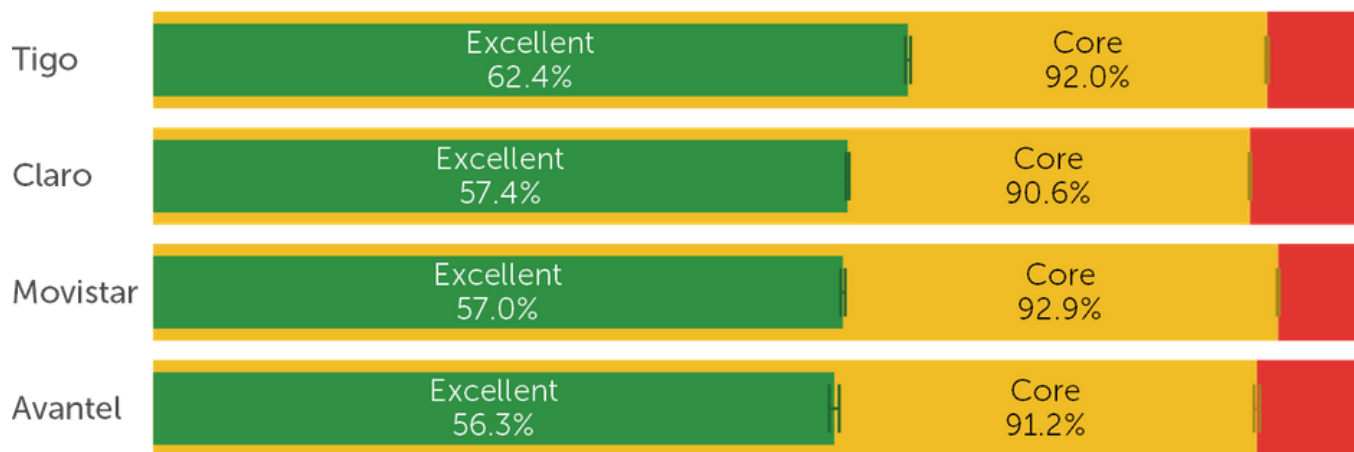
Consistent Quality

In Common Coverage Areas across Colombia, Tigo had the highest Excellent Consistent Quality in the country with 62.4% of tests good enough for a range of applications including HD video calling, movie streaming, or mobile gaming. Claro was close behind with a difference of only 5.0%, followed by Movistar with a 5.4% difference, and Avantel at 6.1% difference. For Core Consistent Quality, all operators in the country reached the 90% threshold and

were very close in competition. Movistar had the highest Core Consistent Quality in Colombia with 92.9% despite its third place ranking in the Excellent Consistent Quality. Tigo followed close behind Movistar with a difference of 0.9% for a Core Consistent Quality of 92.0%. Avantel was at a difference of only 0.8% behind Tigo, and Claro had the lowest Core Consistent Quality percentage at 90.6% despite its second place ranking for Excellent Consistent Quality.

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Consistent Quality Percentage in Common Coverage Areas



Download throughput

In Common Coverage Areas across Colombia, Claro had the fastest median download speed in the country at 10.1 Mbps. In similar fashion to the Consistent Quality metric, the difference between the operators

was small; just 2 Mbps separated first and last place. Tigo was in second place with a median download speed of 9.0 Mbps, Movistar third with 8.7 Mbps, and Avantel fourth with 8.1 Mbps.

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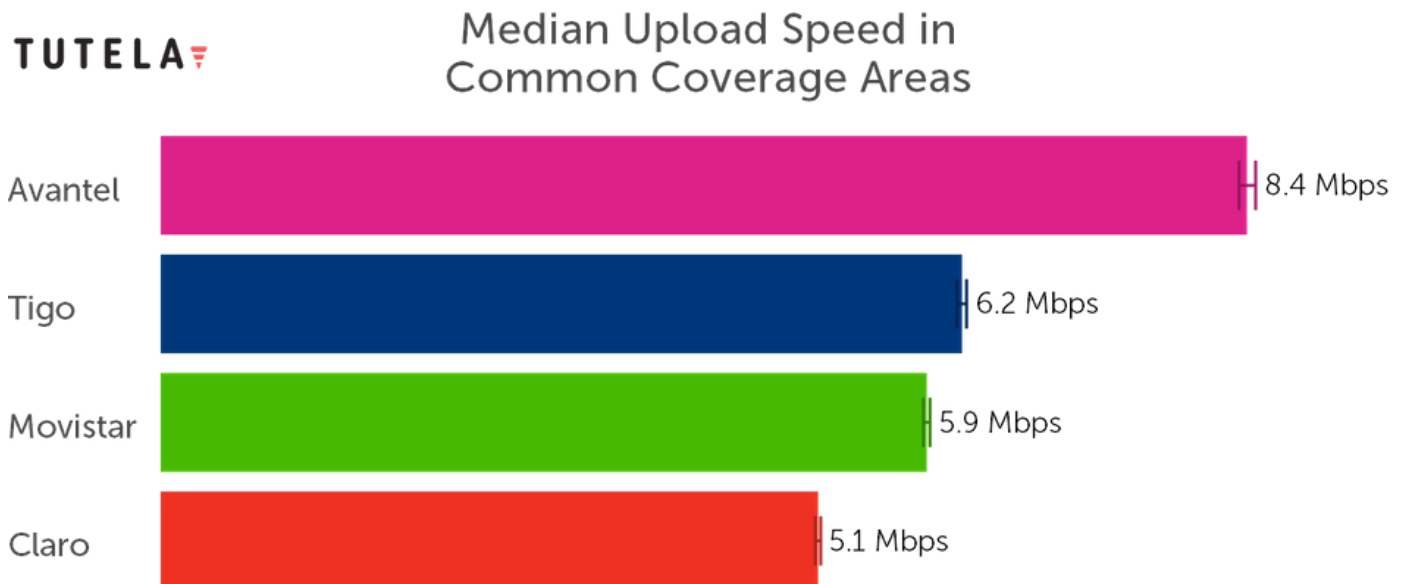
Median Download Speed in Common Coverage Areas



Upload throughput

For upload speeds, we saw some operators move away from the competition. Despite its last place ranking in the download speed test, Avantel had the fastest median upload speed in Colombia with 8.4 Mbps. Tigo had the second fastest median upload speed at

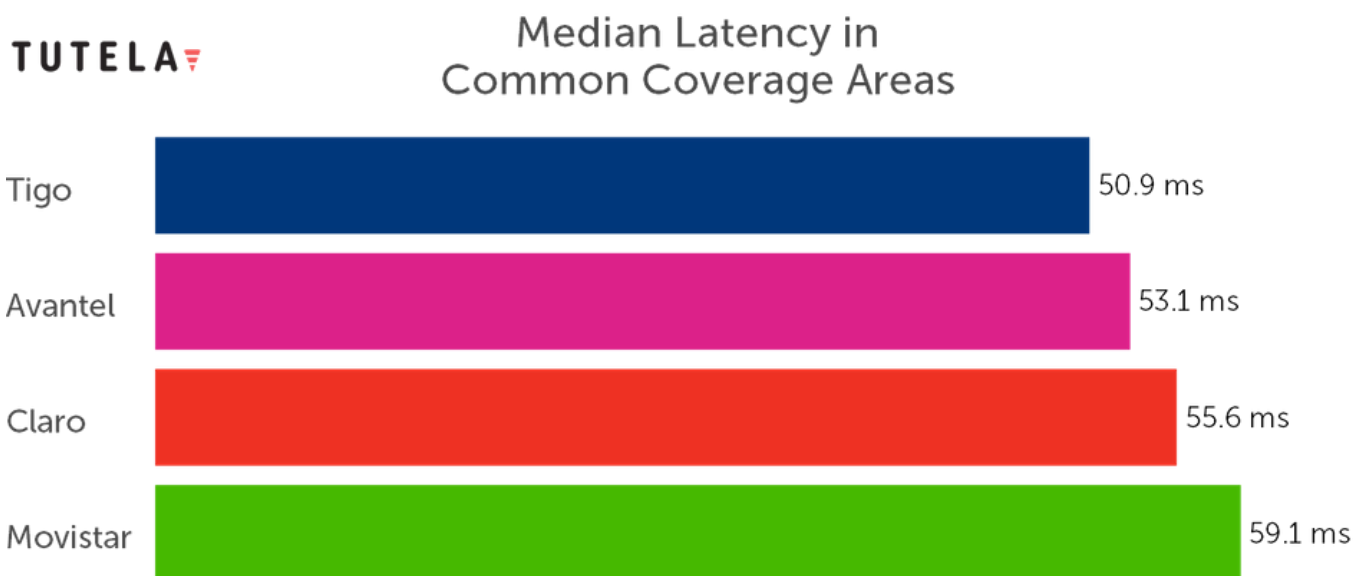
6.2 Mbps, 2.2 Mbps slower than Avantel. Movistar was 2.5 Mbps slower than Avantel; and in last place, despite its first place ranking in the download speed test, Claro had the slowest median upload speed in the country with 5.1 Mbps.



Latency

The latency results saw another change to the operator rankings, with Tigo taking the top spot with a median one-way latency of 50.9 ms in Common Coverage Areas across Colombia. This is a positive result for the operator that it is more responsive to those use-cases where responsiveness matters,

such as video calling or mobile gaming, than its download speed of 9.0 Mbps might have first suggested. Avantel was close behind Tigo with a result of 53.1 ms, followed by Claro at 55.6 ms and Movistar with the highest one-way latency result at 59.1 ms, 8.2 ms higher than first place Tigo.





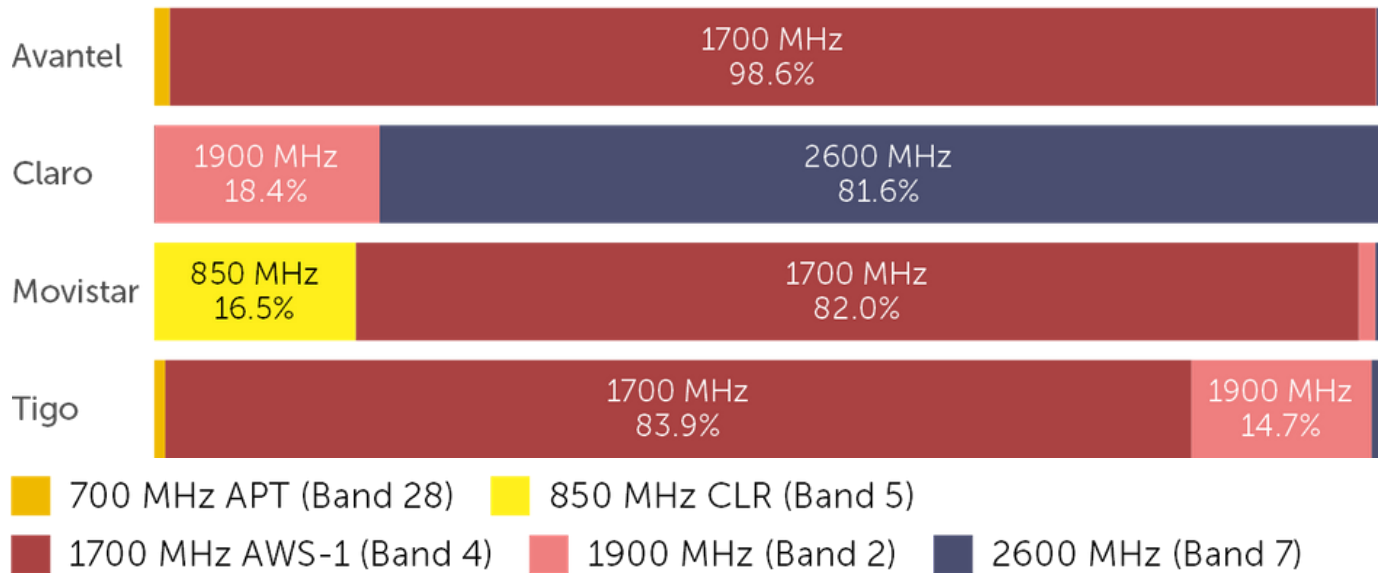
Technology usage

While all four operators in Colombia utilize the 4G network to some extent, users on the Avantel network spent 73.0% of the time on this connection type. Meanwhile, the other three operators have very similar levels of 4G utilization: Tigo users are on a 4G network 66.5% of the time, followed closely by Movistar at 66.0% and Claro at 65.6%. This is likely a factor of network demographics - Avantel users tend to be based in the larger cities of Colombia, where 4G use is more prevalent, while users on the other operators are more widely distributed across the country.

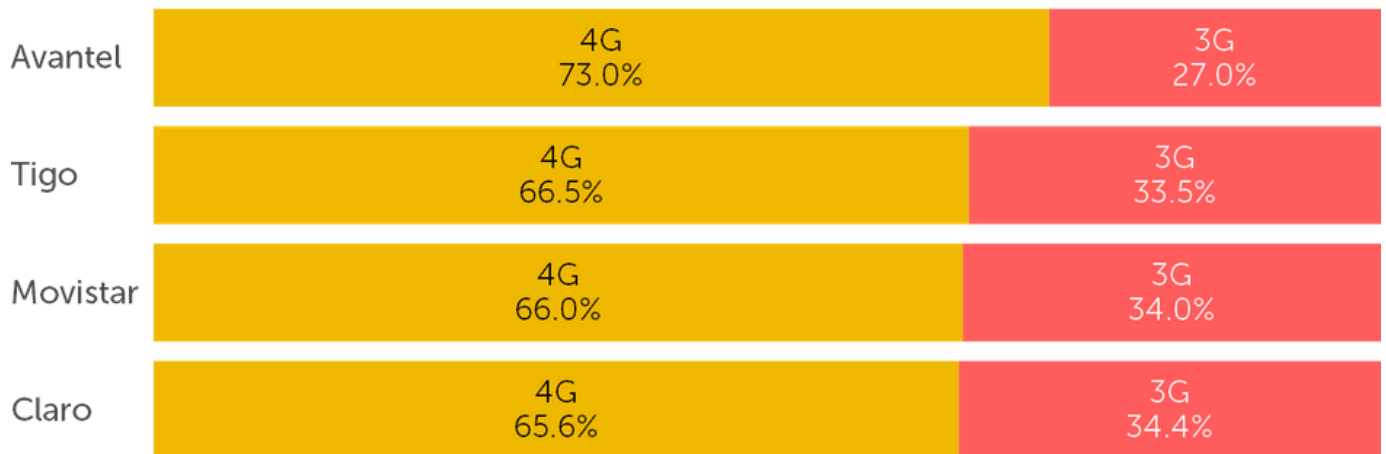
Avantel, Tigo and Movistar all rely heavily on the 1700 MHz spectrum, although Avantel is the only operator to rely almost exclusively on this. Claro is the only operator to rely the most heavily on 2600 MHz spectrum. Despite Claro and Tigo's successful bid for this back in December 2019, the use of 700 MHz spectrum is extremely low in the country over the last six months - although this will likely rise sharply over the year when operators have a chance to deploy the new spectrum. This will address some of the challenges of achieving widespread 4G coverage; the reliance on mid band spectrum for most operators - as well as Claro's highband usage, likely provides good capacity but limited reach.



Mobile Data Volume by LTE Band Nationwide



Percent of Time by Mobile Connection Type Nationwide





Methodology

Tutela is an independent crowdsourced data company with a global panel of over 300 million smartphone users. We gather information on mobile infrastructure and test wireless experience, helping organisations in the mobile industry to understand and improve the world's networks.

Tutela collects data and runs network tests via software embedded in a diverse range of over 3000 consumer applications, which enable the measurement of real-world quality of experience for mobile users, 24/7. For this report, Tutela has collected over 1 billion records in Common Coverage Areas across Colombia, collected between December 1, 2019 and May 31, 2020.

Tutela measures network quality based on the real-world performance of actual network subscribers, inclusive of occasions when a network or tariff may be throttled or congested, and of users on the flanker sub-brands of operators. Results in this report are based on a testing configuration designed to represent the typical (rather than maximum) performance that users experience. We use a 2 MB file to perform our download testing and a 1 MB file to perform our upload testing. Latency performance in this report reflects one-way UDP latency. Tests are conducted against the same content delivery networks that power many of the world's most popular consumer applications, and as such reflect the end-to-end performance of the network.

Consistent Quality

Download speed is most often used as a proxy for network quality, but while download throughput is important, it's just one of several crucial requirements for a "good" connection.

As operators have upgraded 3G networks to LTE-Advanced technology, theoretical (and even real-world) peak throughput speeds have increased to where they vastly outstrip the maximum needed for any current use-case. Real-world speeds above 100 Mbps are now common in parts of the world, and with a 4K video stream — which itself is rarely something smartphone users need — using a fifth of that, average download speed has lost some of its relevance as the dominant statistic used to measure the quality of wireless networks.

At its most basic, a good connection is one that doesn't get in the way of users doing what they want to do. In the real world, smartphone users aren't running speed tests all day — they're browsing the web, using apps, voice calling their friends, streaming Netflix and YouTube, or making video calls.



To more objectively evaluate when networks are (and are not) enabling users to do those things, Tutela has developed a standard called consistent quality. Simply put, it's two sets of thresholds, called Excellent and Core. If a connection hits the Excellent standard, it's sufficient for the most demanding mobile use-cases, like HD group video calling or 1080p video streaming. A Core connection is good enough for SD video streaming, web browsing, emails, and VOIP calling, but users are more likely to experience delays or

buffering when trying to use more demanding apps. Tutela bases the threshold values on the minimum performance requirements published by popular apps. We most recently updated our Consistent Quality thresholds on [September 1st, 2019](#).

Tutela's consistent quality metric, as used in our reports, simply measures the percentage of time that users can hit the thresholds. The higher the number, the more often users have a Core or Excellent quality connection.

Excellent Quality

KPI	Download throughput	Upload throughput	Latency	Jitter	Packet loss
Minimum acceptable value	5 Mbps	1.5 Mbps	50 ms	30 ms	1%

Core Quality

KPI	Download throughput	Upload throughput	Latency	Jitter	Packet loss
Minimum acceptable value	1.5 Mbps	500 Kbps	100 ms	50 ms	5%

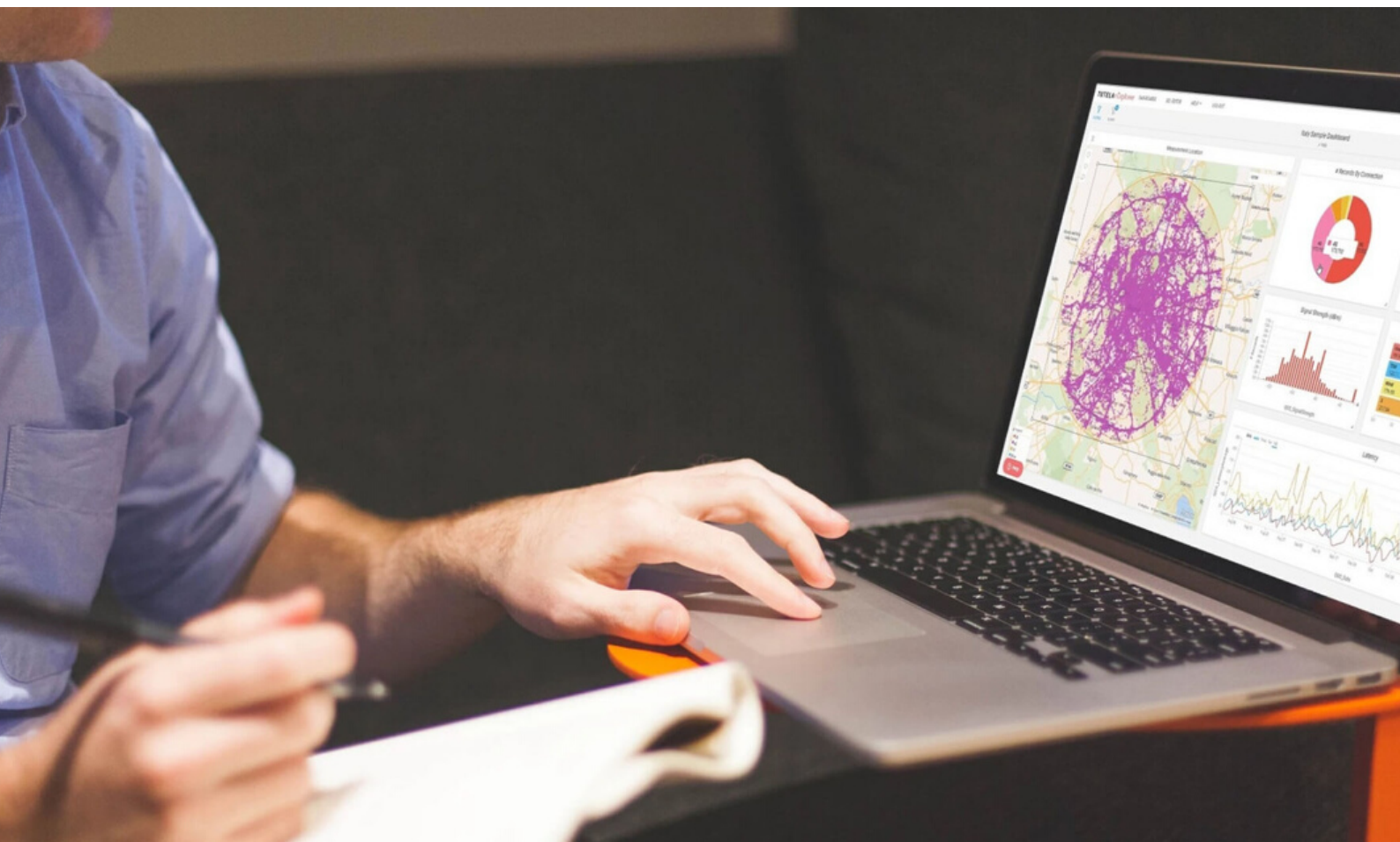
Discover Tutela Explorer

Tutela Explorer is a powerful cloud-based solution for real-time analysis of crowdsourced data. Using the platform, mobile operators can:

- Create coverage and quality maps
- Benchmark network quality and coverage across all operators
- Drill down to any KPI at city, street or even building level
- Analyse spectrum utilisation, performance and more

Visit www.tutela.com/explorer to learn more

Learn more



Appendix

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Results Overview Nationwide

	Download Throughput	Upload Throughput	Latency	Excellent CQ	Core CQ
Avantel	8.0 Mbps \pm 0.08 Mbps	8.3 Mbps \pm 0.06 Mbps	53.2 ms \pm 0.005 ms	55.71% \pm 0.41%	90.74% \pm 0.24%
Claro	9.6 Mbps \pm 0.03 Mbps	4.7 Mbps \pm 0.02 Mbps	56.2 ms \pm 0.005 ms	55.98% \pm 0.13%	89.88% \pm 0.08%
Movistar	8.2 Mbps \pm 0.05 Mbps	5.7 Mbps \pm 0.03 Mbps	59.6 ms \pm 0.009 ms	55.46% \pm 0.18%	92.39% \pm 0.10%
Tigo	8.9 Mbps \pm 0.06 Mbps	6.1 Mbps \pm 0.03 Mbps	51.0 ms \pm 0.007 ms	61.94% \pm 0.22%	91.87% \pm 0.12%

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Results Overview in Common Coverage Areas

	Download Throughput	Upload Throughput	Latency	Excellent CQ	Core CQ
Avantel	8.1 Mbps \pm 0.09 Mbps	8.4 Mbps \pm 0.07 Mbps	53.1 ms \pm 0.005 ms	56.27% \pm 0.41%	91.18% \pm 0.24%
Claro	10.1 Mbps \pm 0.05 Mbps	5.1 Mbps \pm 0.02 Mbps	55.6 ms \pm 0.005 ms	57.36% \pm 0.13%	90.62% \pm 0.08%
Movistar	8.7 Mbps \pm 0.06 Mbps	5.9 Mbps \pm 0.03 Mbps	59.1 ms \pm 0.008 ms	56.98% \pm 0.19%	92.95% \pm 0.10%
Tigo	9.0 Mbps \pm 0.06 Mbps	6.2 Mbps \pm 0.04 Mbps	50.9 ms \pm 0.007 ms	62.35% \pm 0.22%	92.04% \pm 0.12%

About Tutela

Tutela Technologies, Ltd., is an independent crowdsourced data company with a global panel of over 300 million smartphone users. It gathers information on mobile infrastructure and tests wireless experience, helping organizations in the mobile industry to understand and improve the world's networks. Data and insights provided by Tutela are trusted by the engineering teams at mobile network operators and network equipment manufacturers around the world and used to compare operators as well as inform decisions in network and infrastructure planning and optimisation. The organization is headquartered in Victoria, British Columbia.

Tutela does not collect any sensitive personal data and is compliant with international privacy regulations including CCPA and GDPR.

For further information about the methodology, data and tools used to create this report, please contact analysis@tutela.com or visit www.tutela.com.

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