



**TUTELA** 

Peru

State of Mobile Networks

Analysts  
Fi Armstrong

MAY 2020

Annual Report

[www.tutela.com](http://www.tutela.com)

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# Introduction

Peru's telecoms industry has made strides over the last year, both in terms of regulation(1), and in terms of the number of users who benefit – with subscriber growth for combined mobile and Internet services up year on year and predicted to continue rising into 2025 by the GSMA(2). In the region, mobile connectivity holds particular importance, with mobile accounting for 91% of Internet connections(3). With such a high importance on the service, it's critical that the operators are able to provide widespread access to reliable, effective telecommunications services to help connect the population.

Meanwhile, Peru is positioning itself as a potential leader in 5G deployments in the LATAM region – with a likely outcome that some users' first connection will be on this ultra-fast, ultra-low latency technology. All four operators have now completed 5G trials

in the market, with Bitel the last to do so in October 2019(4), while 5G spectrum auctions are planned for this year to aid in additional 4G and future 5G deployments. This new technology will likely be crucial for providing capacity for data services as more of the country becomes connected.

At this critical juncture in Peruvian telecommunications, as societal and technological change accelerate as pace, Tutela's latest State of Mobile Networks report benchmarks the four national operators to determine the current status of mobile connectivity in the county. In this report, Tutela has evaluated over 1 billion records in Common Coverage Areas across Peru, including 4.5 million speed tests and 82 million latency tests, between October 1, 2019 and March 31, 2020.

(1) Telesemana, Tras la polémica, Perú bloqueará equipos sub-estándar el 5 de abril de 2020  
<https://www.telesemana.com/blog/2019/12/23/tras-la-polemica-peru-bloqueara-equipos-sub-estandar-el-5-de-abril-de-2020/>

Retrieved 23 April 2020

(2) GSMA, The Mobile Economy Latin America 2019

[https://www.gsma.com/mobileeconomy/wp-content/uploads/2020/03/GSMA\\_MobileEconomy2020\\_LATAM\\_Eng.pdf](https://www.gsma.com/mobileeconomy/wp-content/uploads/2020/03/GSMA_MobileEconomy2020_LATAM_Eng.pdf)

Retrieved 23 April 2020

(3) BNAmericas, Spotlight: Peru getting back on the right connectivity path

<https://www.bnamericas.com/en/features/spotlight-peru-getting-back-on-the-right-connectivity-path>

Retrieved 23 April 2020

(4) BNAmericas, Bitel carries out 5G tests in Peru

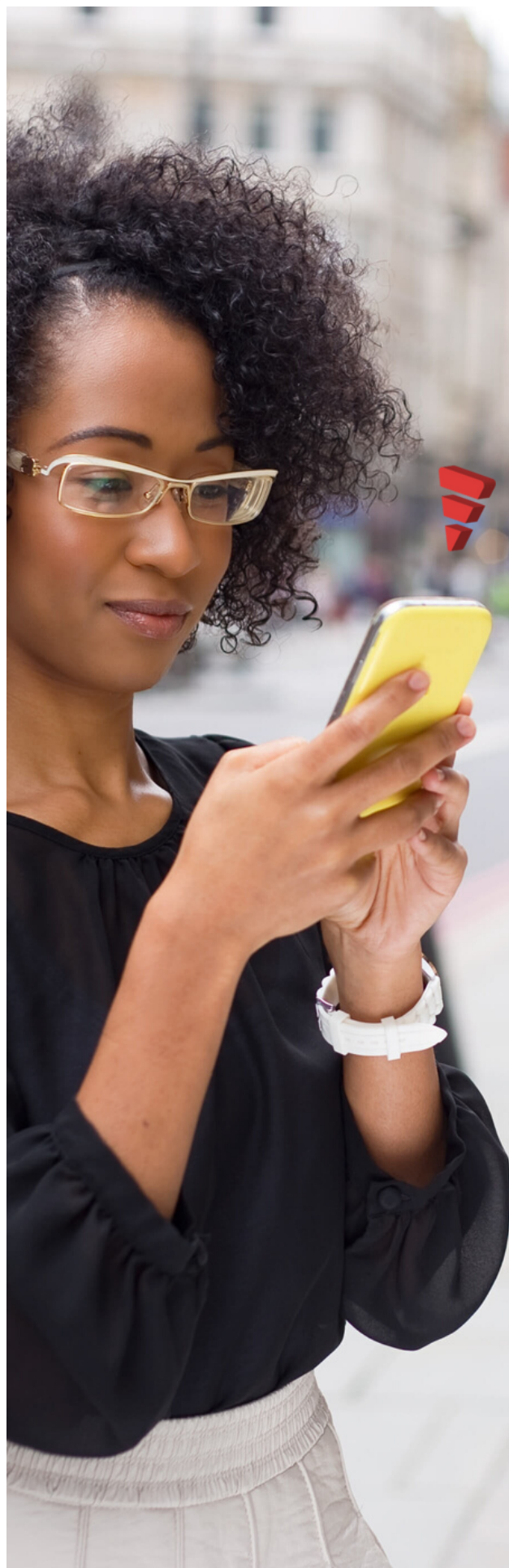
<https://www.bnamericas.com/en/news/bitel-carries-out-5g-tests-in-peru>

Retrieved 23 April 2020



## Key findings

- Entel excelled across the board, winning on all five metrics tested, with an Excellent Consistent Quality of 53.5%, and a median download speed of 12.3 Mbps.
- In every category, Movistar also placed second – its median download speed was 10.7 Mbps – not far behind Entel – however its Excellent Consistent Quality was 9% lower at 44.5%.
- Although there is a significant gap between first and last-placed operators in most categories, all four Peruvian operators provided a relatively similar Core Consistent Quality, Tutela’s metric for a connection fast enough for day-to-day activities like SD video streaming and web browsing. Just 7% separated first-place Entel from last-place Bitel, showing that all operators are providing a connection sufficient for everyday use-cases the vast majority of the time.



# Results overview

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Mobile experience results

Peru, May 2020



Claro



bitel

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 Peru, including 4.5 million speed tests and 82 million latency tests, between October 1, 2019 and March 31, 2020.

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



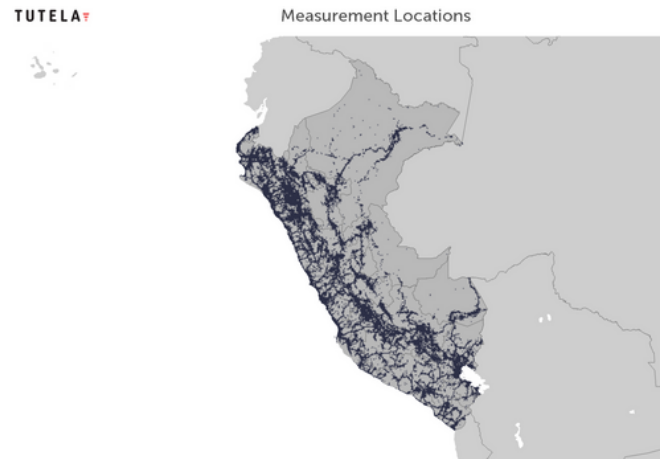
Based on the highest Excellent Consistent Quality in Common Coverage Areas.

# 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.

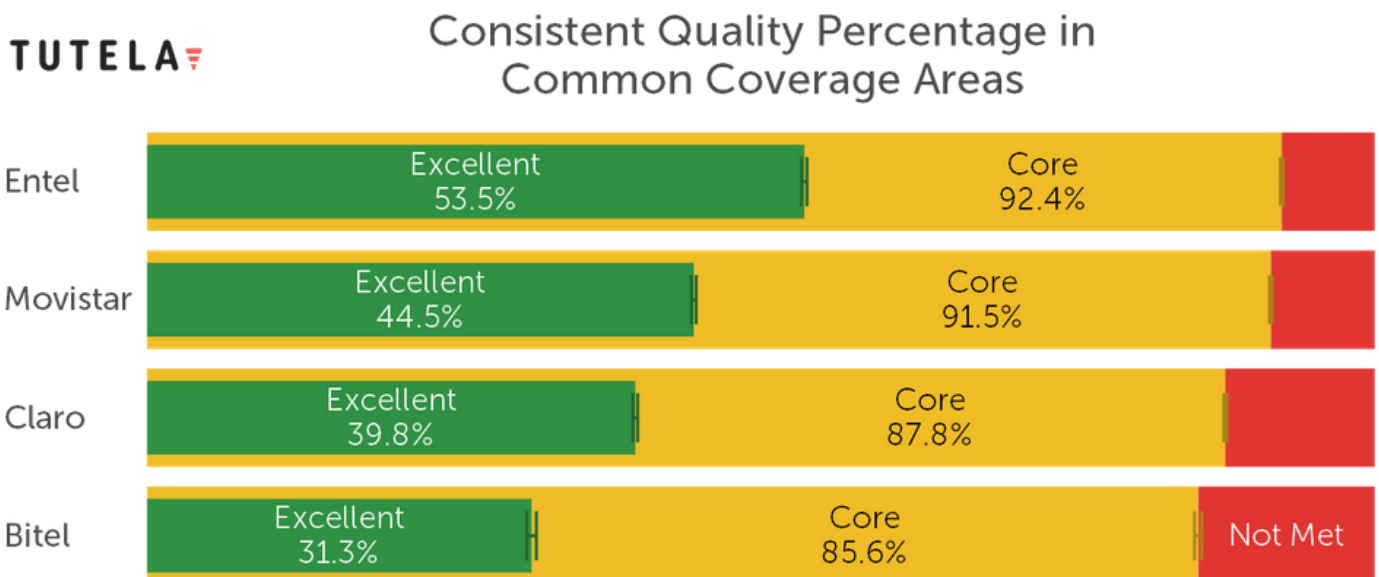
Common Coverage Areas are parts of the country where the majority of operators offer service. In this report, we present results nationally and from Common Coverage Areas, which helps present both a full national picture, as well as highlighting network conditions wherever operators are directly in competition.



# Consistent Quality

Entel had both the highest Excellent and Core Consistent Quality in Peru, with 53.5% of tests meeting the Excellent Consistent Quality thresholds Tutela uses to represent a range of use cases including HD video calling, 1080p video streaming or realtime game streaming. This means more than half

of the time, an Entel subscriber is likely able to do any of these activities. Meanwhile, both Entel and Movistar users experience a network suitable for uses such as SD video streaming, VoIP calls and social media use more than 90% of the time – with Entel again getting the highest result.



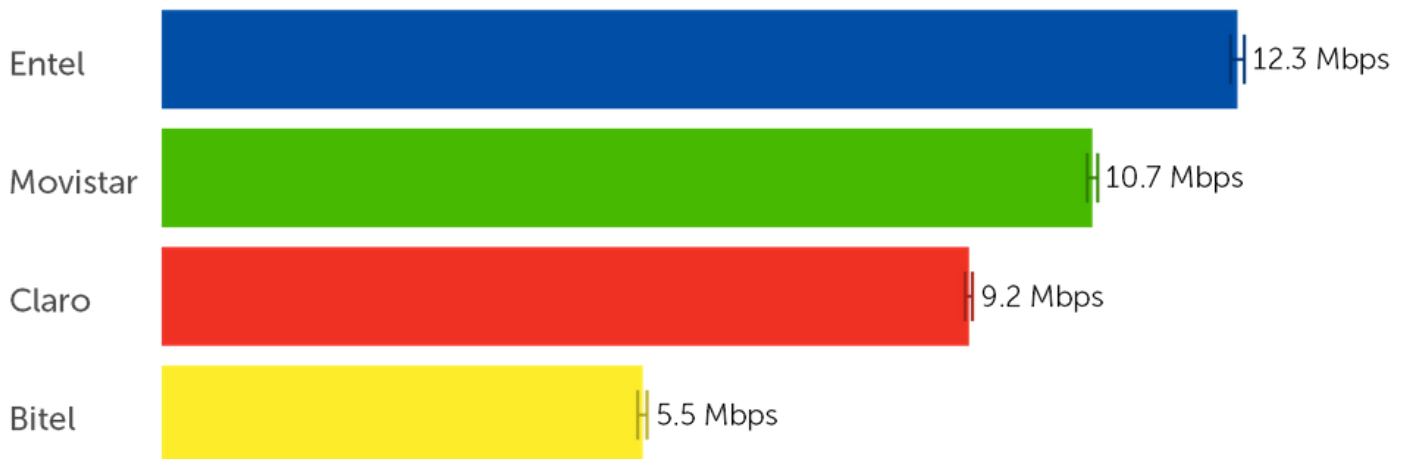
# Download throughput

Entel was also the fastest network in Peru based on median download speed, with a median of 12.3 Mbps. Again, Movistar was in

second place at 10.7 Mbps, with Claro in third (9.2 Mbps) and Bitel last (5.5 Mbps).

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## Median Download Speed in Common Coverage Areas

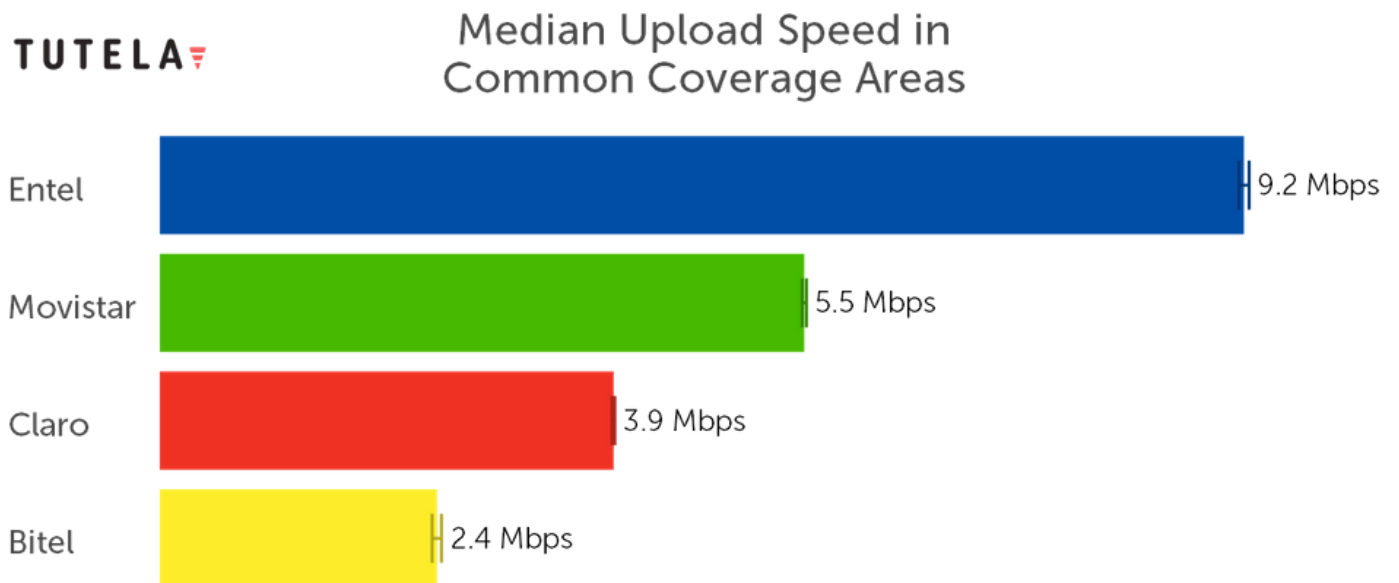




# Upload throughput

For median upload throughput, Entel placed first at 9.2 Mbps, with a commanding 3.7 Mbps lead over second-place Movistar.

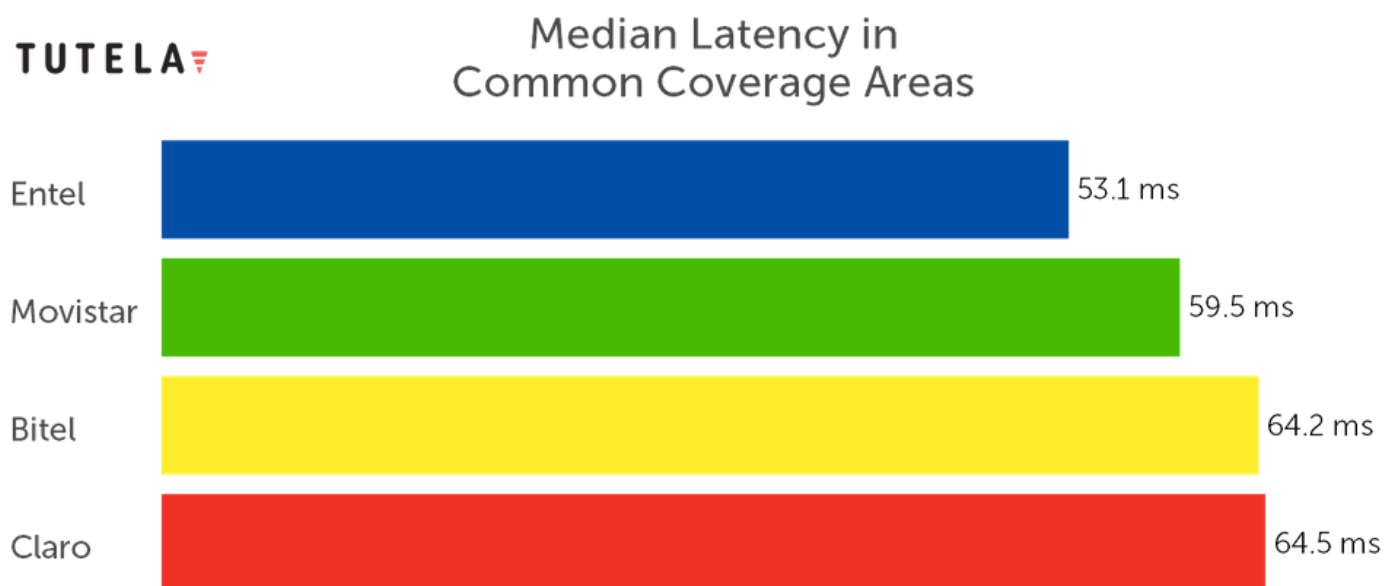
The two frontrunners were followed by Claro at 3.9 Mbps and Bitel at 2.4 Mbps.



# Latency

Entel users experienced the lowest one-way median latency in Peru at 53.1 ms, making it the most responsive network. However, the grouping of operators was much closer than

for some other metrics. Just 11.4 ms separated first and last place, with just 0.3 ms between third and fourth place Bitel and Claro.





## Technology usage

Bitel's LTE network relies heavily on low-band spectrum, with more than two-thirds of LTE data traffic using the 900 MHz spectrum as its primary band. The remaining LTE data traffic is split between mid-band (1900 MHz) and high-band (2600 MHz) spectrum in near-equal measure. One of the interesting features of the Bitel network is how much time users still spend on 3G technology – more than double that of the other main networks. This is likely a significant contributing factor to Bitel's performance often being lower than the market-leaders in Peru, with 3G connections traditionally slower, with higher latency, than their 4G equivalents. As recently as mid-2019, Bitel still appeared to have more 3G base stations than 4G ones(5).

(5) Telecompaper, Bitel Peru hits 1.5Gbps in first 5G tests

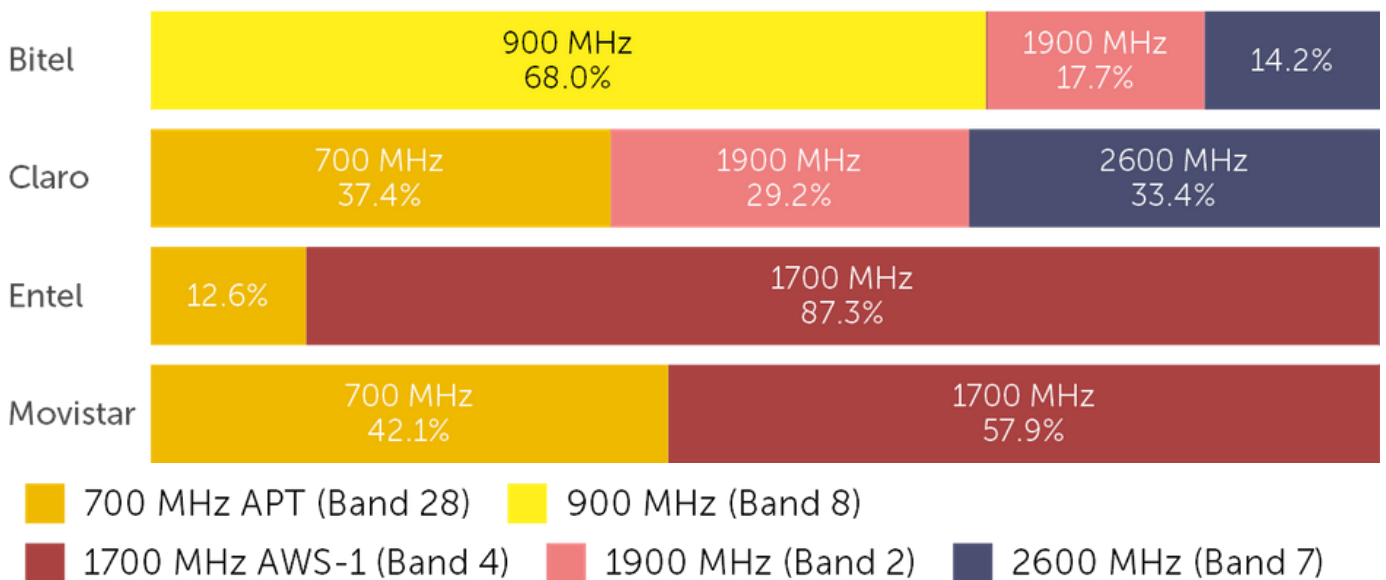
<https://www.telecompaper.com/news/bitel-peru-hits-15gbps-in-first-5g-tests-1312835>

Retrieved 28 April 2020

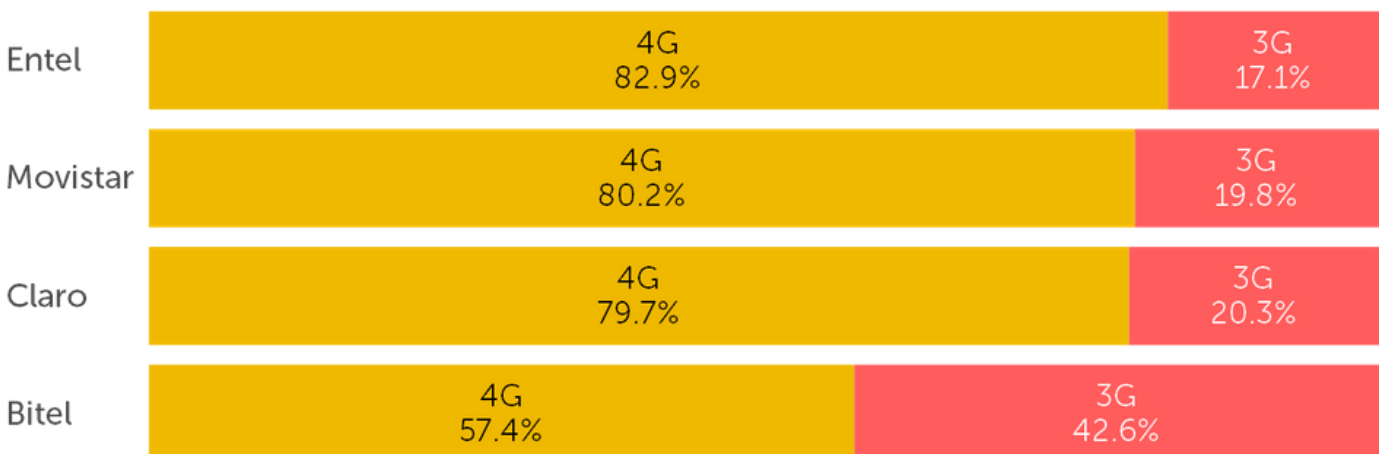
Entel and Movistar both split their LTE traffic between the 700 MHz and 1700 MHz bands for primary transmission - albeit in different ratios. Movistar transfers about two-fifths of its LTE data traffic over 700 MHz, while Entel used the band for just 12.6% of its traffic. Meanwhile, Claro's LTE data traffic

strategy is similar to Bitel's in that it was split over a low-, mid-, and high-band frequency. Claro's LTE was split fairly evenly between the three, with a slightly higher volume using the lower-band spectrum - which likely provides greater coverage, as well as better performance in buildings.

**TUTELA** Mobile Data Volume by LTE Band Nationwide



**TUTELA** Percent of Time by Mobile Connection Type Nationwide







## Methodology

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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 Peru, between October 1, 2019 and March 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%

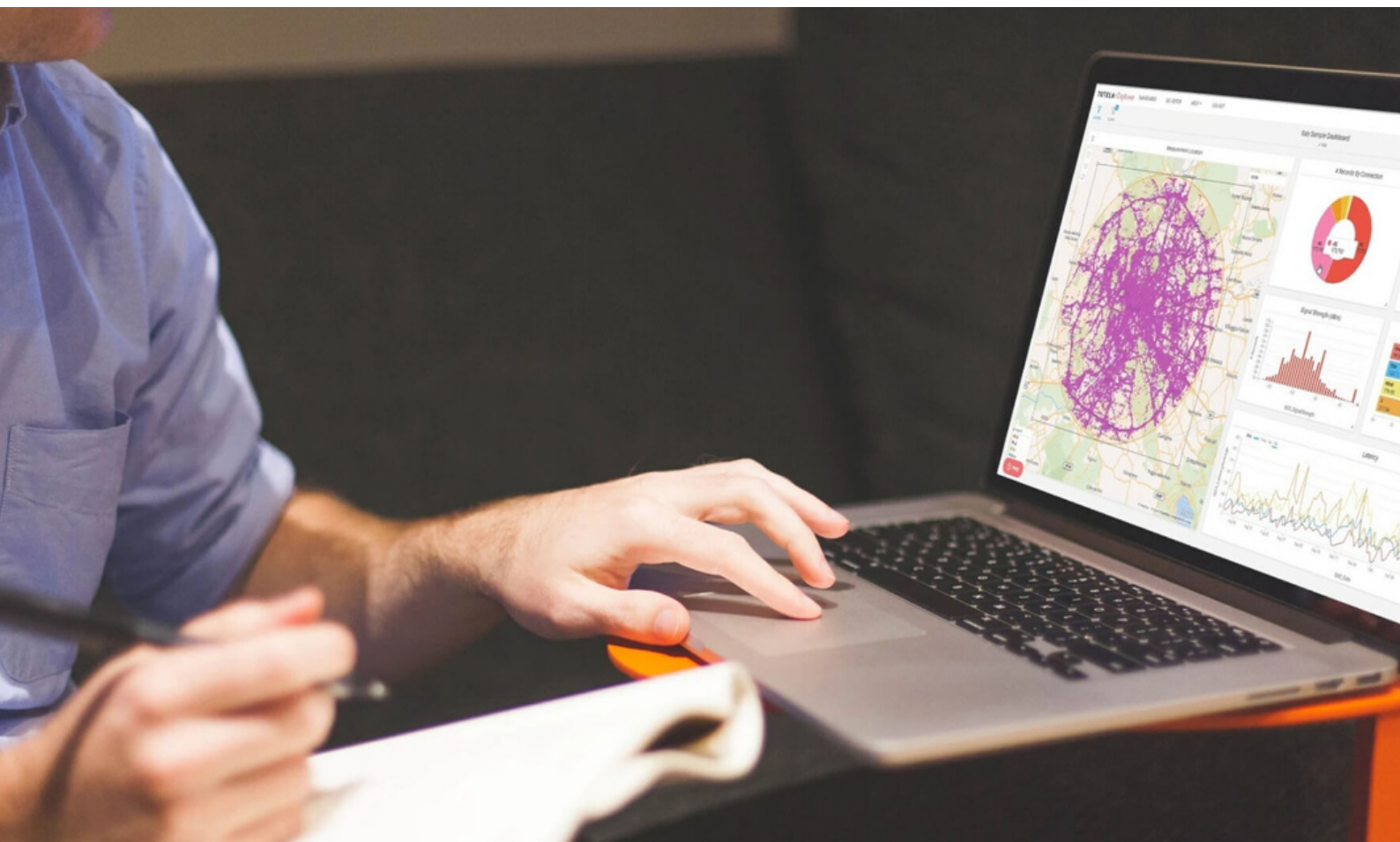
# Discover Tutela Explorer

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](http://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
Bitel	5.4 Mbps $\pm$ 0.05 Mbps	2.2 Mbps $\pm$ 0.03 Mbps	64.7 ms $\pm$ 0.015 ms	30.64% $\pm$ 0.38%	85.32% $\pm$ 0.29%
Claro	9.1 Mbps $\pm$ 0.04 Mbps	3.8 Mbps $\pm$ 0.01 Mbps	65.3 ms $\pm$ 0.029 ms	38.94% $\pm$ 0.19%	87.44% $\pm$ 0.13%
Entel	12.3 Mbps $\pm$ 0.08 Mbps	9.2 Mbps $\pm$ 0.04 Mbps	53.1 ms $\pm$ 0.005 ms	53.38% $\pm$ 0.22%	92.42% $\pm$ 0.12%
Movistar	10.5 Mbps $\pm$ 0.06 Mbps	5.4 Mbps $\pm$ 0.02 Mbps	59.7 ms $\pm$ 0.008 ms	44.18% $\pm$ 0.20%	91.34% $\pm$ 0.11%

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## Results Overview in Common Coverage Areas

	Download Throughput	Upload Throughput	Latency	Excellent CQ	Core CQ
Bitel	5.5 Mbps $\pm$ 0.06 Mbps	2.4 Mbps $\pm$ 0.04 Mbps	64.2 ms $\pm$ 0.015 ms	31.32% $\pm$ 0.39%	85.64% $\pm$ 0.29%
Claro	9.2 Mbps $\pm$ 0.04 Mbps	3.9 Mbps $\pm$ 0.01 Mbps	64.5 ms $\pm$ 0.028 ms	39.77% $\pm$ 0.19%	87.84% $\pm$ 0.13%
Entel	12.3 Mbps $\pm$ 0.08 Mbps	9.2 Mbps $\pm$ 0.04 Mbps	53.1 ms $\pm$ 0.005 ms	53.54% $\pm$ 0.22%	92.44% $\pm$ 0.12%
Movistar	10.7 Mbps $\pm$ 0.06 Mbps	5.5 Mbps $\pm$ 0.02 Mbps	59.5 ms $\pm$ 0.007 ms	44.53% $\pm$ 0.20%	91.55% $\pm$ 0.11%



# 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](mailto:analysis@tutela.com) or visit [www.tutela.com](http://www.tutela.com).

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