TUTELA

Chile

State of Mobile Networks

Analysts

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Annual Report

APRIL 2020

www.tutela.com

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Introduction

In these unprecedented times, people are looking to their government and industry leaders for guidance as the world is told to stay indoors and find comfort in community connection via the internet. It's more important than ever to have the best mobile plan with quality data at everyone's fingertips, and narrow that digital divide gap through implementing better infrastructure.

In Chile, telecom operators here as well as across Latin America are strengthening their networks to keep up with the incoming tide of demand(1) and providing benefits such as free social apps to ensure people are entertained at home(2). In regards to demand for 5G, this has been a slow burn with the Chilean regulator only opening this up for public consultation back in January(3) of this year while other countries started deployment in 2019. However, Chile is deemed to have the most modern telecom infrastructures in place out of other countries in Latin America(4) and could easily pave the way for the most effective deployment of 5G and set the benchmark for other countries to follow suit. For now, Chilean operators can continue to focus on providing the very best performance on their current 4G networks, and we can see the four big telcos are doing just that in the results below.

In this State of Mobile report, Tutela has collected and analyzed over 7 million speed tests, 136 million latency tests, and over 1.6 billion total mobile records between September 1st 2019 and February 29th 2020 to build a complete picture of mobile network experience across the country.

(1) BNAmericas, Coronavirus: Telcos scramble to beef up networks as people stay home
https://www.bnamericas.com/en/features/coronavirus-telcos-scramble-to-beef-up-networks-as-people-stay-home
Retrieved 09 April 2020

(2) BioBioChile, Entel, Claro y Movistar ofrecen beneficios y servicios gratis para fomentar cuarentena
https://www.biobiochile.cl/noticias/economia/tu-bolsillo/2020/03/19/entel-claro-y-movistar-ofrecen-beneficios-y-servicios-gratis-para-fomentar-cuarentena.shtml
Retrieved 09 April 2020

(3) Telecompaper, Chile launches consultation on 5G auction conditions
https://www.telecompaper.com/news/chile-launches-consultation-on-5g-auction-conditions--1322823
Retrieved 09 April 2020

(4) Privacy Shield, Chile - Telecommunications Sector
https://www.privacyshield.gov/article?id=Chile-Telecommunications-Sector
Retrieved 09 April 2020

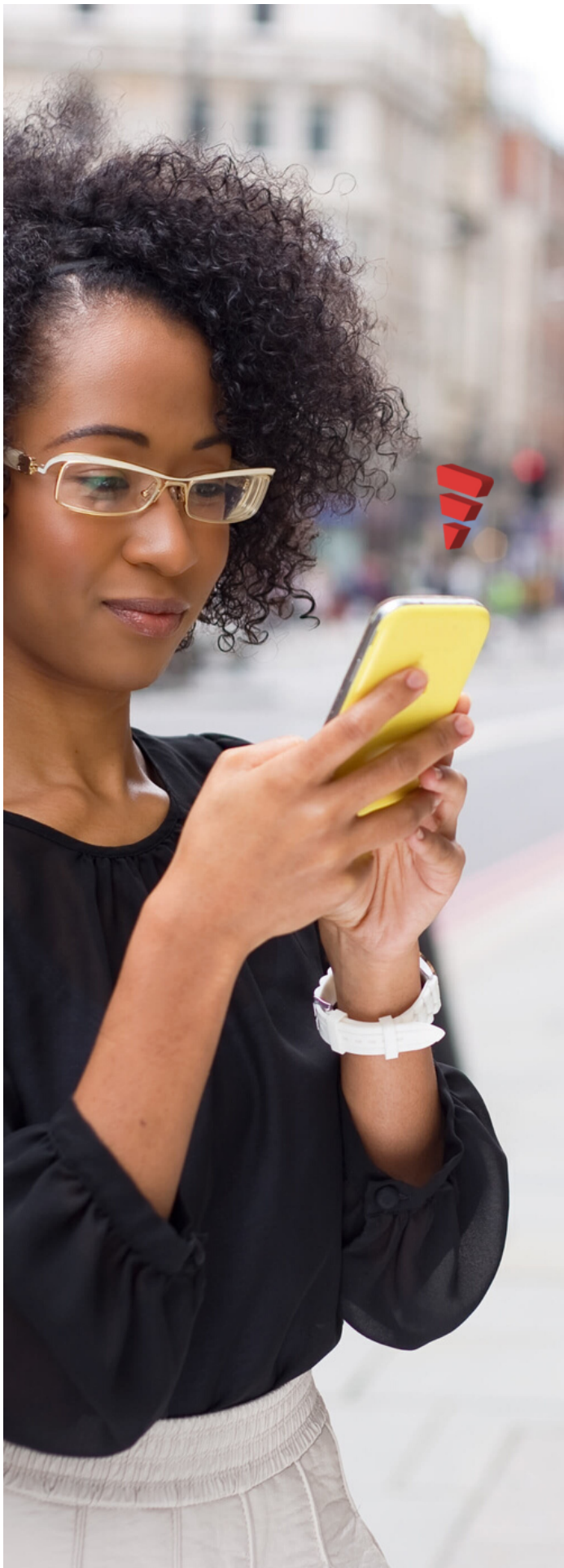
Key findings

- Entel dominated in four of the five metrics tested in Common Coverage Areas of Chile, starting with having the highest Excellent Consistent Quality percentage at 62.1%.

- WOM had the best latency in Chile with a one-way result of 37.5 ms and the second best upload speed with only 1 Mbps separating the operator from first place Entel.

- The 2600 MHz spectrum is widely used by three of the four operators, with WOM being the exception by investing 100% into the 1700 Mhz.

- Telefonica's Movistar may not have taken out any awards this time but was never far behind the operators, with only 5.9% difference in performance compared to Entel in the Core Consistent Quality metric.



Results overview

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Mobile experience results

Chile, April 2020

	Entel	WOM	Claro	movistar
Excellent Consistent Quality	★ Winner			
Core Consistent Quality	★ Winner			
Download throughput	★ Winner			
Upload throughput	★ Winner			
Latency		★ Winner		

Results from over 1.6 billion records in Common Coverage Areas across Chile, collected between September 1, 2019 and February 29, 2020.

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

TUTELA
Best Mobile Network Experience
APRIL 2020

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

Understanding this report

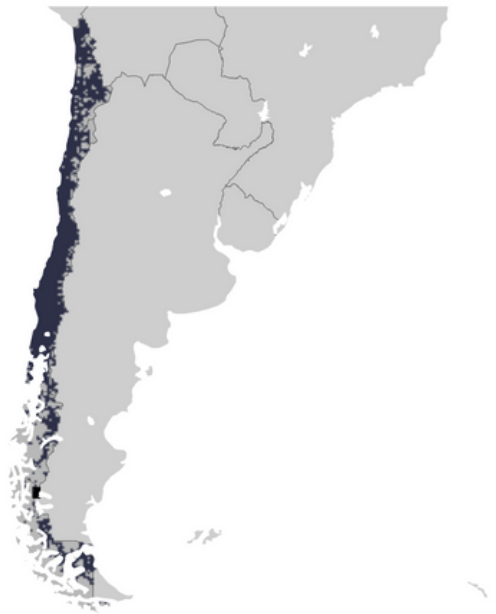
Tutela uses two key methodological components to best compare user experience across operators: Consistent Quality and Common Coverage Areas. Consistent Quality is a set of metrics that Tutela has developed to objectively evaluate when networks are (and are not) enabling users to do almost everything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

Common Coverage Areas

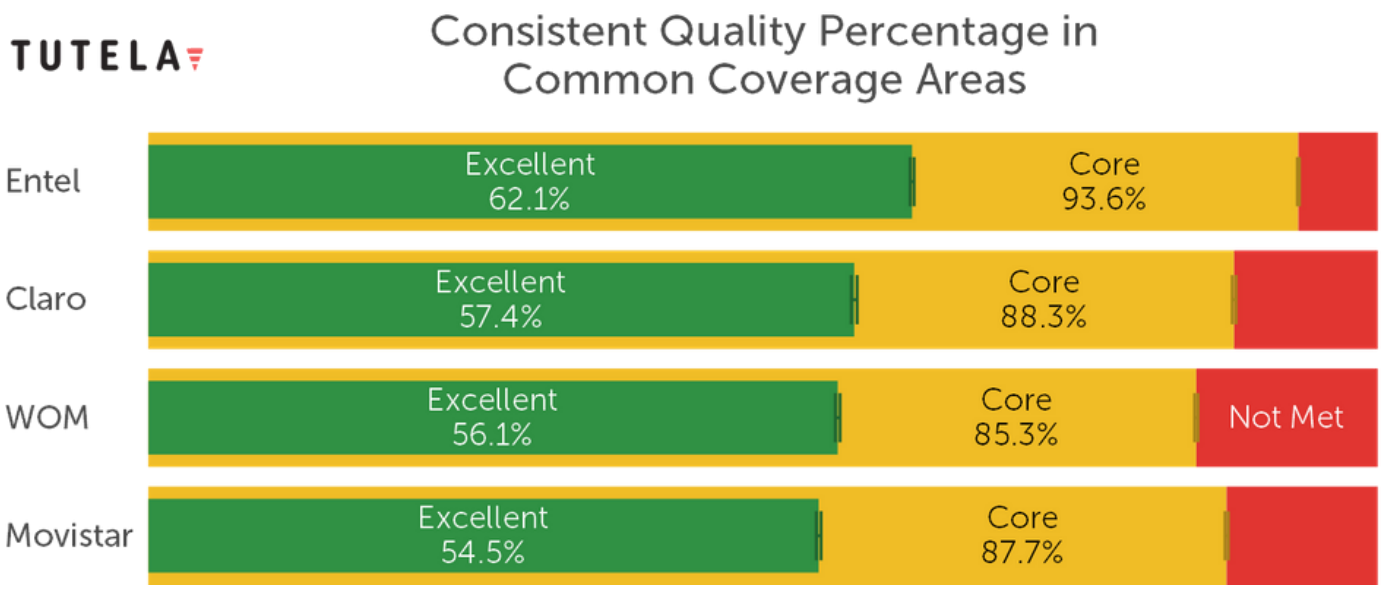
Measurement Locations



Consistent Quality

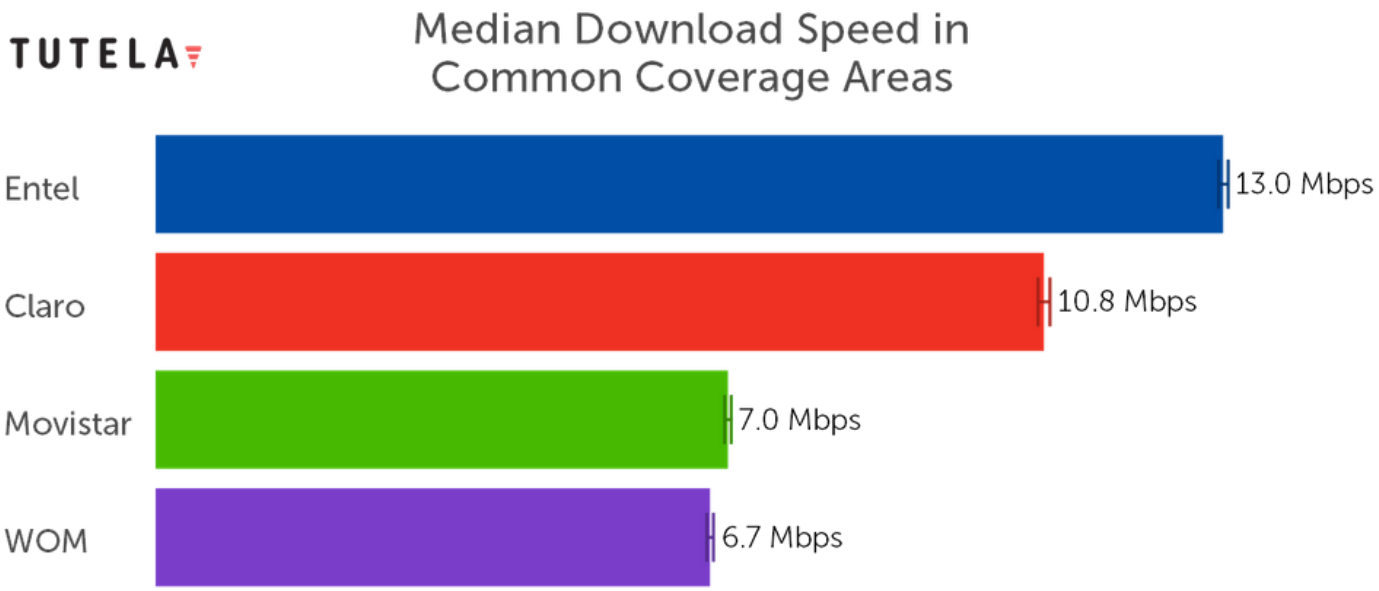
Entel had the highest Excellent Consistent Quality percentage in Chile, with 62.1%. Entel is also the only operator in the country to reach the 90% threshold for Core Consistent Quality with 93.6%. With a performance difference of 4.7%, Claro is in second place with an Excellent Consistent Quality percentage of 57.4%. For Core Consistent Quality, there is a performance difference of 5.3% between Claro and Entel.

WOM is in third place with an Excellent Consistent Quality of 56.1%, and is found to have the lowest Core Consistent Quality in Chile with 85.3%. Movistar had the lowest Excellent Consistent Quality in Chile with 54.5% and narrowly managed to have the third highest Core with 87.7%, only 0.6% separating Claro and the operator in the rankings.



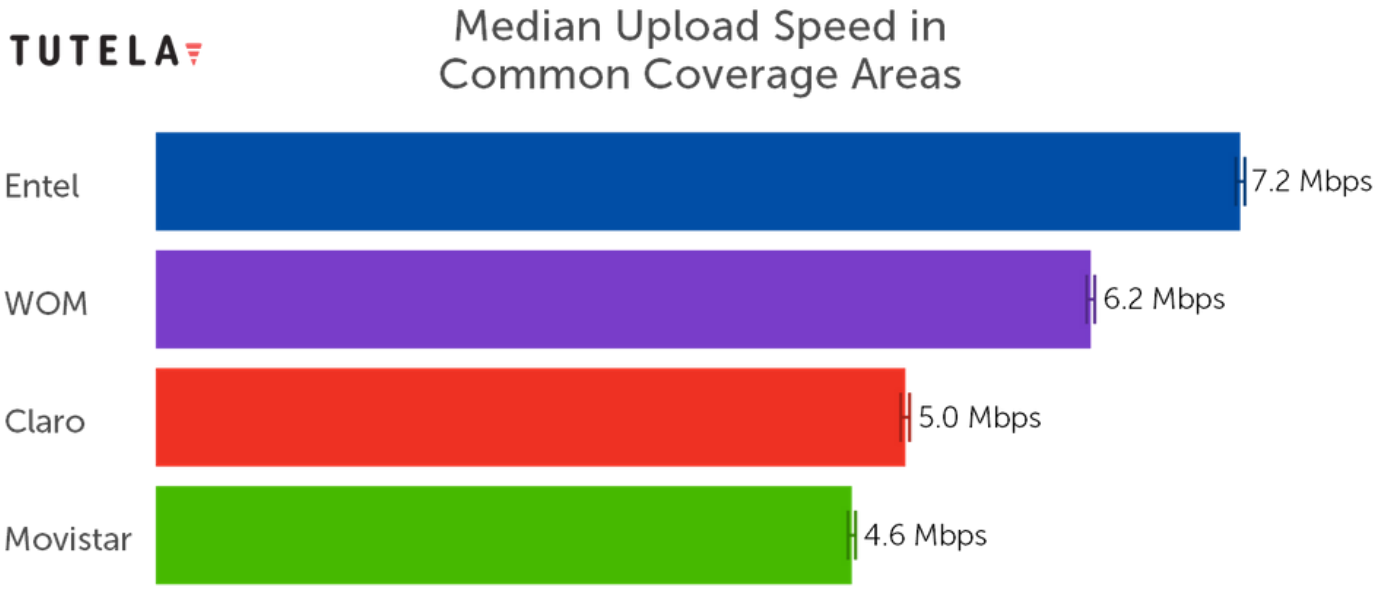
Download throughput

In the Common Coverage Areas of Chile, Entel had the fastest median download speed in the country with 13.0 Mbps. In similar fashion to the Consistent Quality metric, Claro again stuck close to its competitor, Entel, with the second fastest median download speed of 10.8 Mbps, a difference of 2.2 Mbps. Movistar and WOM had median download speeds of 7.0 and 6.7 Mbps, respectively.



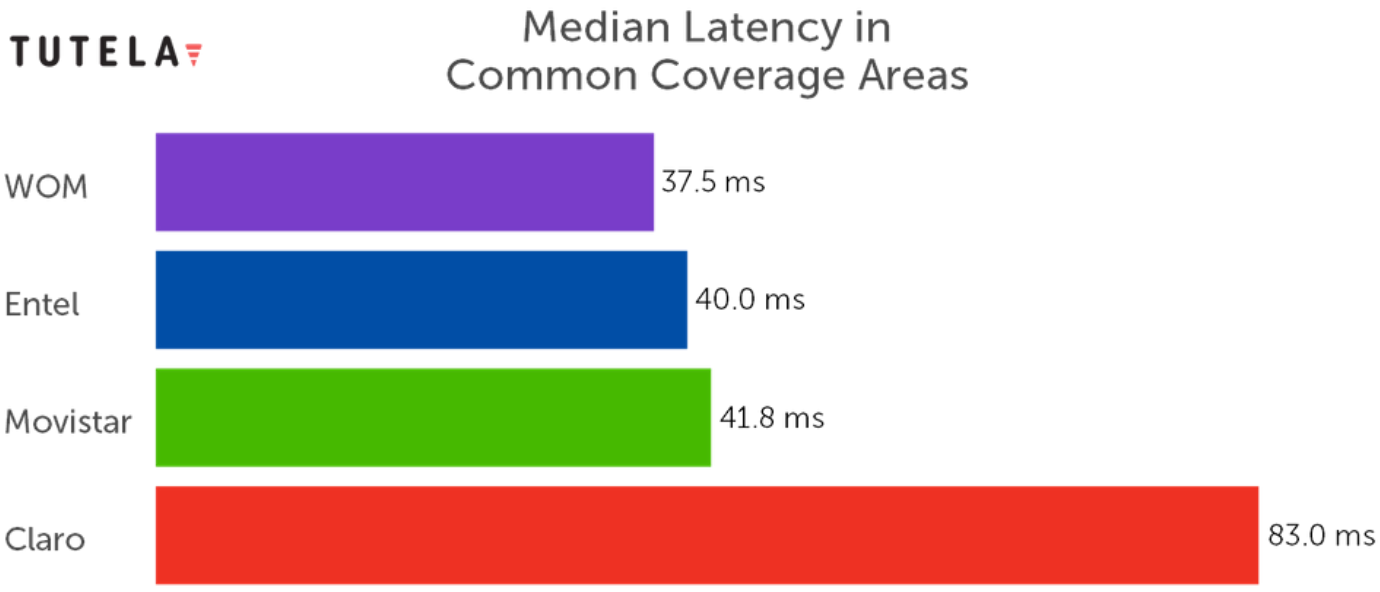
Upload throughput

For upload speeds, Entel was still in first place with the fastest median upload speed. Despite WOM having the lowest median download speed in Chile, the operator came in second for upload with only a difference of 1 Mbps from Entel. There is also a difference of only 0.5 Mbps between WOM's download and upload performance. Claro halves its performance against download to only 5.0 Mbps median upload speed, pushing it into third place. Movistar had the slowest upload speed in Chile with 4.6 Mbps, 2.6 Mbps behind Eentel.



Latency

Latency is where we see some changes to performance rankings as WOM took out the top spot for the first time with a one-way result of 37.5 ms in Common Coverage Areas of Chile. 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 a first look at its download speed of 6.7 Mbps might suggest. And despite being one of the operators with the least amount of spectrum(5) utilized, it is keeping up with its competition. Entel was second, with only 2.5 ms separating it from WOM and Movistar was also not far behind with a latency of 41.8 ms. The real difference is the performance of Claro for latency with a significantly-higher result of 83.0 ms - an issue that appears to be due to how Claro handles the UDP protocol as we do not see the same level of difference when looking at ICMP latency.



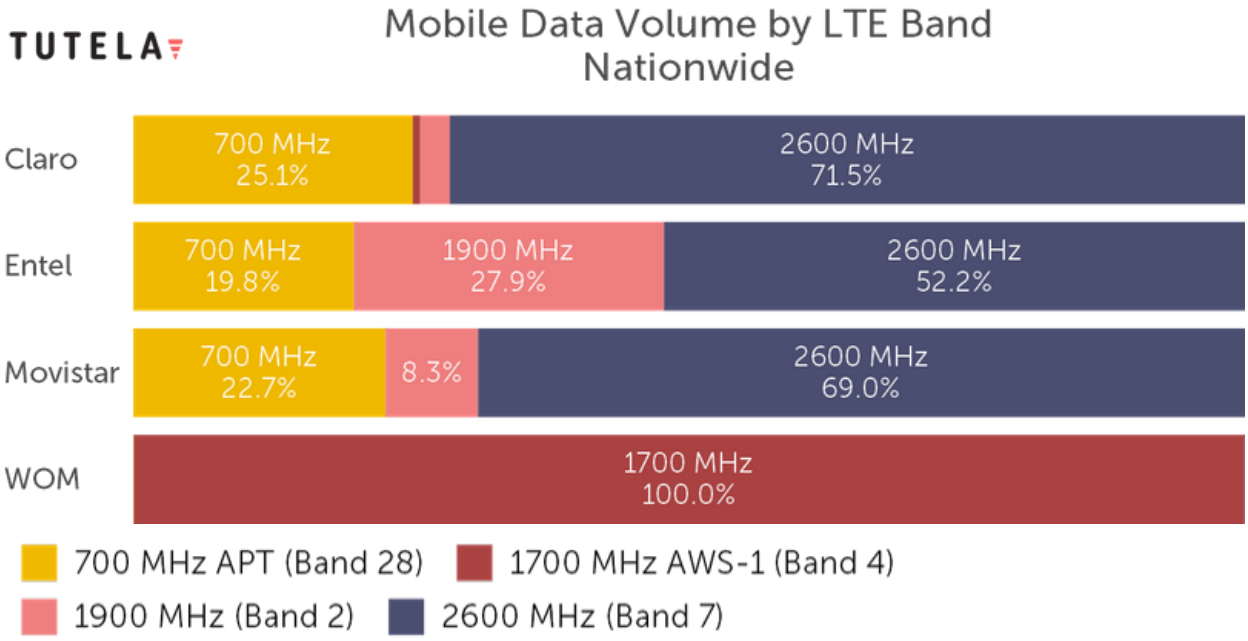
(5) Telecompaper, Chile court approves use of dynamic spectrum caps model
https://www.telecompaper.com/news/chile-court-approves-use-of-dynamic-spectrum-caps-model--1319219
Retrieved 07 April 2020

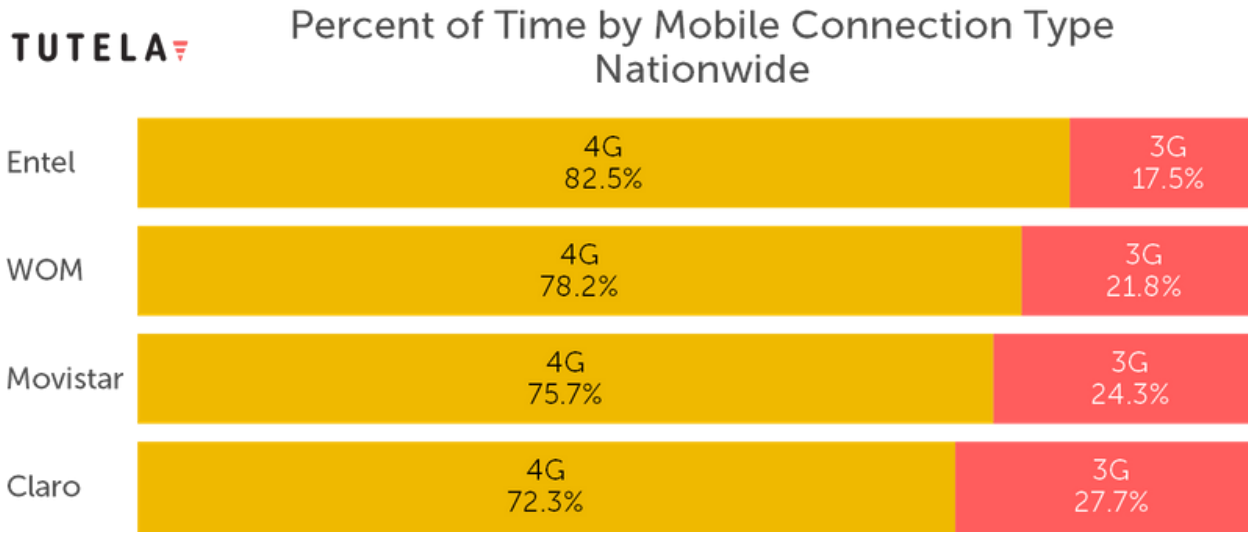
Technology usage

All four operators in Chile utilize the 4G network with users nationwide spending over 70% of the time on this connection type. For Entel users, this is 82.5% of the time. For the 3G network, Claro users will spend only 27.7% of the time on this connection.

Claro, Entel and Movistar all rely heavily on the higher band 2600 MHz spectrum, with Claro utilizing it the most with 71.5% of mobile data traffic using it as the primary band. WOM is in a league of its own with it being the only operator to utilize the 1700 Mhz spectrum for 100% of data traffic of it instead of dabbling in other spectrum, which may lead to difficulties with in-building performance where lower-band spectrum can help. The 1900 MHz is less used by operators, with Entel utilizing only 27.9% of that and Movistar with only 8.3% deployed.

Following on from an August 2019 blog on Chile's LTE deployment(6), we can still see that the low-band 700 MHz is not widely used in Chile but does give the likes of Entel a nice breadth of spectrum as it has heavily invested in 700 Mhz, 1900 Mhz, and 2600 Mhz to balance capacity and coverage with the right spectrum deployment for the job.





(6) Tutela, Keeping up with LTE in Chile
https://www.tutela.com/blog/keeping-up-with-lte-in-chile
Retrieved 07 April 2020

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 7 million speed tests, 136 million latency tests, and over 1.6 billion total mobile records between September 1st 2019 and February 29th 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%

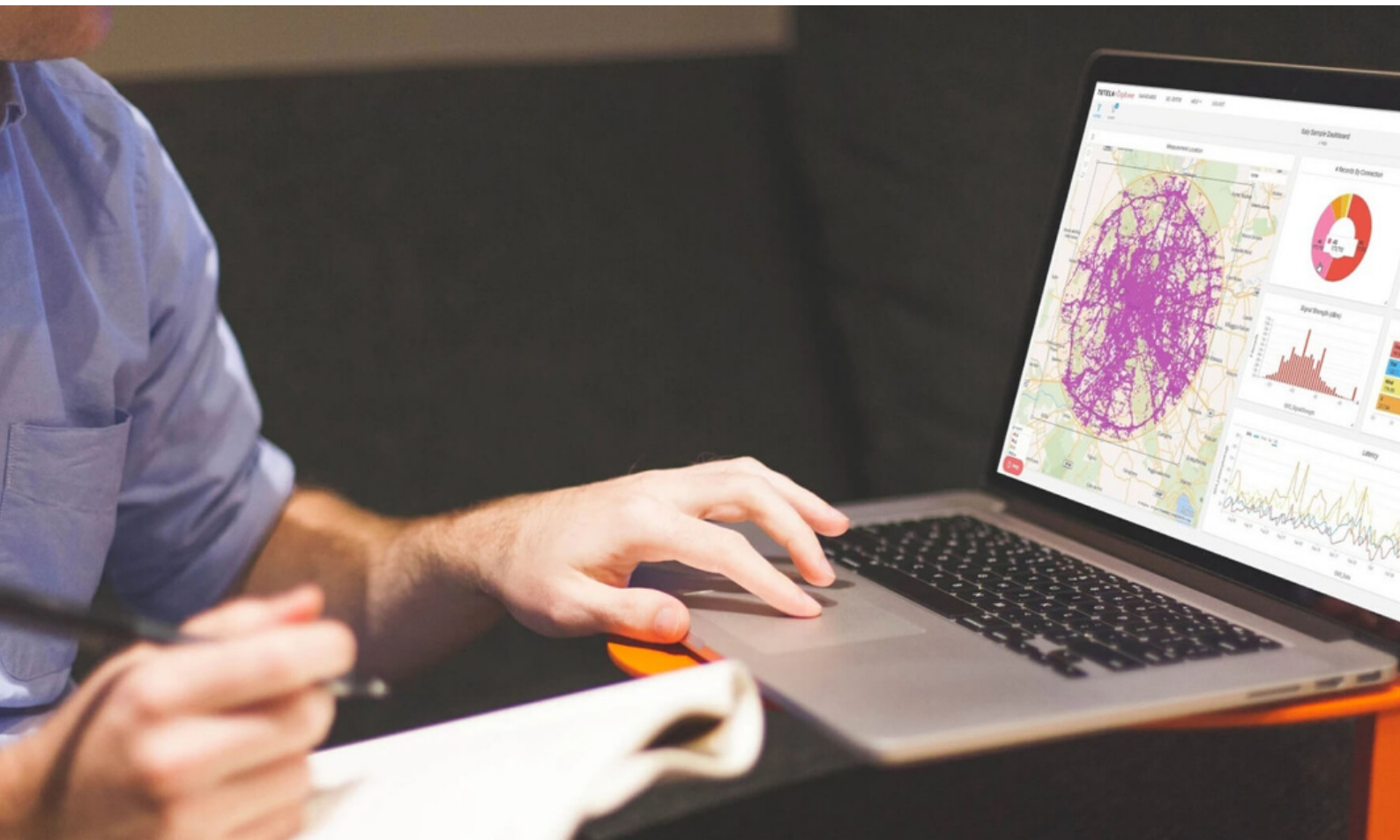
Discover Tutela Explorer

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 Common Coverage Areas

	Download Throughput	Upload Throughput	Latency	Excellent CQ	Core CQ
Claro	10.8 Mbps ± 0.07 Mbps	5.0 Mbps ± 0.03 Mbps	83.0 ms ± 0.012 ms	57.42% ± 0.24%	88.33% ± 0.16%
Entel	13.0 Mbps ± 0.06 Mbps	7.2 Mbps ± 0.03 Mbps	40.0 ms ± 0.005 ms	62.13% ± 0.16%	93.55% ± 0.08%
Movistar	7.0 Mbps ± 0.04 Mbps	4.6 Mbps ± 0.03 Mbps	41.8 ms ± 0.005 ms	54.53% ± 0.19%	87.72% ± 0.13%
WOM	6.7 Mbps ± 0.04 Mbps	6.2 Mbps ± 0.03 Mbps	37.5 ms ± 0.004 ms	56.08% ± 0.19%	85.25% ± 0.14%

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Results Overview Nationwide

	Download Throughput	Upload Throughput	Latency	Excellent CQ	Core CQ
Claro	10.7 Mbps ± 0.07 Mbps	4.9 Mbps ± 0.03 Mbps	83.1 ms ± 0.013 ms	57.25% ± 0.24%	88.23% ± 0.16%
Entel	12.7 Mbps ± 0.06 Mbps	7.0 Mbps ± 0.03 Mbps	40.4 ms ± 0.005 ms	61.30% ± 0.16%	93.22% ± 0.08%
Movistar	6.9 Mbps ± 0.04 Mbps	4.5 Mbps ± 0.02 Mbps	42.0 ms ± 0.005 ms	54.14% ± 0.19%	87.49% ± 0.13%
WOM	6.7 Mbps ± 0.04 Mbps	6.1 Mbps ± 0.03 Mbps	37.6 ms ± 0.004 ms	55.88% ± 0.19%	85.16% ± 0.14%

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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