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France

State of Mobile Networks

Analysts
Montana Jennings
Fiona Armstrong

Annual Report

MARCH 2020

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Introduction

In the first State of Mobile Networks for France, Tutela examines operator performance in this fast paced industry. France may have the third largest telecoms market in Europe(1) but it appears operators and its regulators have been slow to adopt new technology ventures. In the early days of January 2020, the French regulator Arcep opened up the first phase of the 5G spectrum application process to operators(2), essentially becoming the last nation in Europe(3) to start the process while other countries around the world had begun preparations and deployment last year. Despite this, 5G is still a long way off from being usable to all consumers so France may stand to benefit from the additional experience gained by watching other nations work through the early-stage difficulties of fast adoption. Tutela's latest Global Mobile Experience report(4) also showed France in 29th place globally for Excellent Consistent Quality, beating such countries as Germany, United Kingdom and USA.

In this State of Mobile Networks report, Tutela has collected and analyzed over 125 million speed tests, 1 billion latency tests, and over 7 billion total mobile records between August 1st 2019 and January 31st 2020 to build a complete picture of mobile network experience across the country.

(1) BusinessWire, France Telecoms, Mobile and Broadband Statistics and Analyses 2019 - ResearchAndMarkets.com
https://www.businesswire.com/news/home/20191105005756/en/France-Telecoms-Mobile-Broadband-Statistics-Analyses-2019
Retrieved 20 February 2020

(2) Telecompaper, French regulator kicks off first stage of 5G tender process
https://www.telecompaper.com/news/french-regulator-kicks-off-first-stage-of-5g-tender-process--1321430
Retrieved 20 February 2020

(3) Sdxcentral, France Finally Jumps on 5G Bandwagon
https://www.sdxcentral.com/articles/news/france-finally-jumps-on-5g-bandwagon/2020/01/
Retrieved 20 February 2020

(4) Tutela, Global Mobile Experience
https://www.tutela.com/blog/global-mobile-experience-2019
Retrieved 20 February 2020

Key findings

- Orange dominates in four out of five of the metrics tested, with the highest Excellent Consistent Quality in France with 87.3%. It also had the highest Core Consistent Quality, and median download and upload throughput.

- Despite Orange's lead, Bouygues and SFR were tough contenders in all metrics tested, behind Orange by only 5.6% and 7.2% in Excellent Consistent Quality performance.

- Free Mobile had the best latency in the country with 12.7 ms despite coming last in all other metrics. Free Mobile has been on the market for the past 7 years, and was billed as a major disruptor in the industry, but is still struggling to compete in many performance metrics against the more established players.

- Mid-band (1800 Mhz) spectrum is the dominant workhorse of French networks, and was the main primary band used for LTE traffic by volume for Bouygues, SFR and Orange. Free Mobile was unique in preferring to rely on higher-band (2600 Mhz) spectrum for the bulk of its LTE data load, which likely offers benefits in terms of its network's capacity but may struggle to provide reliable connectivity both over a greater distance or inside buildings.
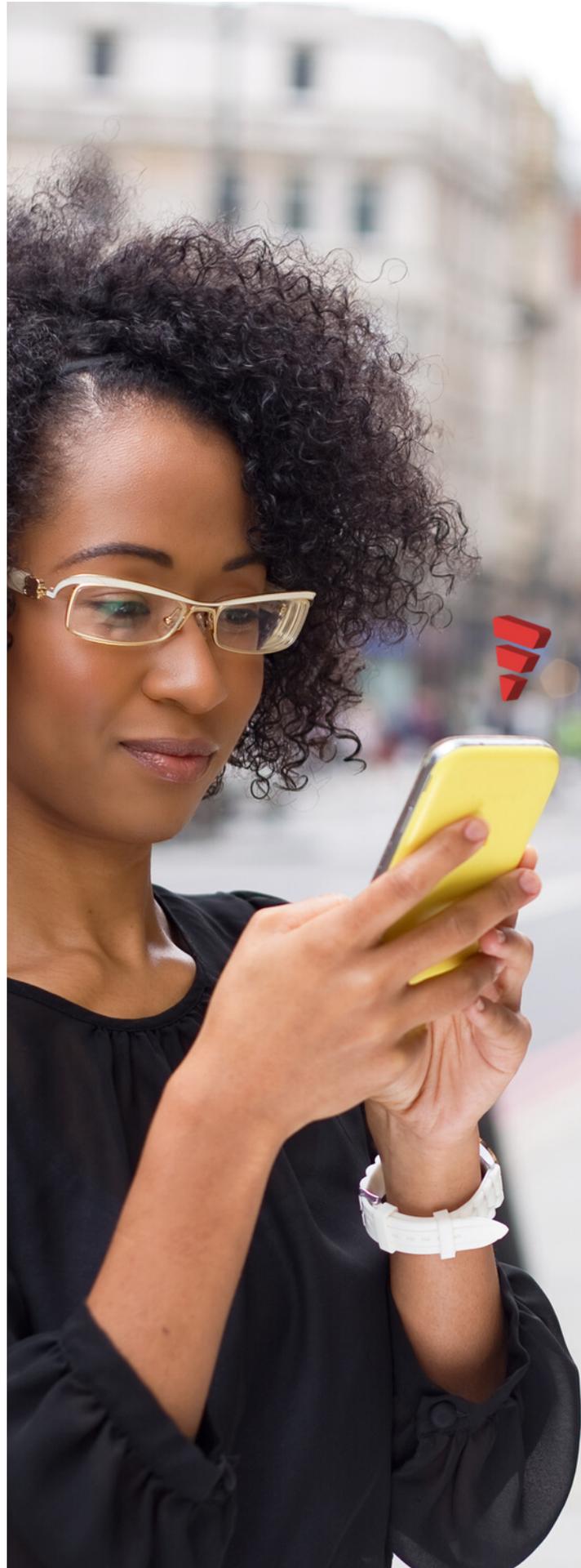
Results overview

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Mobile experience results

France, March 2020

	orange	SFR	free	bouygues
Excellent Consistent Quality	⭐ Winner			
Core Consistent Quality	⭐ Winner			
Download throughput	⭐ Winner			
Upload throughput	⭐ Winner			
Latency			⭐ Winner	

Results from over 125 million speed tests, 1 billion latency tests, and over 7 billion total mobile records between August 1st 2019 and January 31st 2020 in France.

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

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Best Mobile Network Experience

MARCH 2020

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

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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.
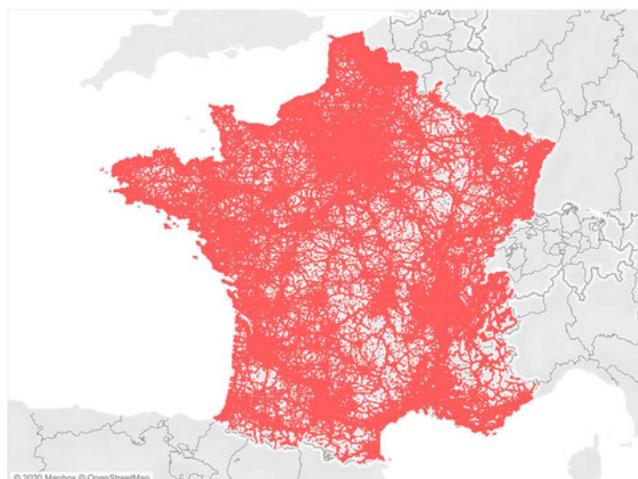
Consistent Quality

Orange mobile users had the best mobile experience in the country, with an Excellent Consistent Quality percentage of 87.3%, however both Bouygues and SFR were hot on its heels with a difference in performance of only 5.6% and 7.2%, respectively. Free Mobile has the lowest Excellent Consistent Quality performance with 71.7%, a difference of 15.6% between the operator and first place Orange.

The difference in performance is much smaller for Core Consistent Quality, with Orange taking our top spot with 98.1% and Free Mobile in fourth with a difference of just 3.9%. All operators did remarkably well for Core, which means users can perform daily use-cases such as web browsing and streaming SD video with ease the vast majority of the time.

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Consistent Quality Percentage in Common Coverage Areas

Operator	Excellent	Core
Orange	Excellent 87.3%	Core 98.1%
Bouygues	Excellent 81.7%	Core 97.3%
SFR	Excellent 80.1%	Core 96.8%
Free Mobile	Excellent 71.7%	Core 94.2%

Download throughput

In Common Coverage Areas of France, Orange performed best for median download speeds with 29.8 Mbps. The rankings stayed the same as the Consistent Quality metric with Bouygues in second place for a median download speed of 21.0 Mbps, and SFR narrowly in third for 20.0 Mbps, although Orange's result was strikingly faster than its competitors. Free Mobile posted the slowest download speed with 12.4 Mbps, a difference in performance between first and fourth place of 17.4 Mbps.

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Median Download Speed in Common Coverage Areas

Operator	Median Download Speed
Orange	29.8Mbps
Bouygues	21.0Mbps
SFR	20.0Mbps
Free Mobile	12.4Mbps

Upload throughput

For Common Coverage Areas of France, we observed significantly lower upload speed results compared to download but this is to be expected, and the results are still favorable for mobile users – on average, far in excess of the 1.5 Mbps upload throughput threshold Tutela uses for Excellent Consistent Quality. Orange has the fastest median upload speed in the country with 8.2

Mbps. Once again, Free Mobile has the slowest performance with a median upload speed with 5.9 Mbps – however the gap between Free Mobile and Orange was just 2.3 Mbps, significantly smaller than the gap for download throughput and suggesting that for most users, upload speeds will be less of a differentiator in France.

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Median Upload Speed in Common Coverage Areas

Operator	Speed
Orange	8.2Mbps
Bouygues	7.3Mbps
SFR	6.7Mbps
Free Mobile	5.9Mbps

Latency

Latency is where we see the biggest change in operator performance rankings as Orange falls to third place with a one-way latency of 14.0 ms. Meanwhile, Free Mobile has the best median latency in Common Coverage Areas of France with 12.7 ms, Bouygues in second with 13.3 ms, and SFR the highest latency at 14.9 ms. Although there is very small difference in latency performance between all operators, it is a positive result for Free Mobile, the smallest operator by market share, suggested that while the network may lag behind in other regards, it excels specifically for use cases where responsiveness matters – which may mean its web browsing, video calls or mobile gaming feels more responsive than its 12.4 Mbps median download speed would at first suggest, and the network could perform better for realtime mobile gaming. The median performance on all four networks was notably fast however, far more so than the 50ms threshold Tutela uses for Excellent Consistent Quality.

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Median Latency in Common Coverage Areas

Operator	Median Latency
Free Mobile	12.7ms
Bouygues	13.3ms
Orange	14.0ms
SFR	14.9ms

Technology usage

Bouygues, SFR and Orange had similar levels of time spent on a 4G network, with Bouygues mobile users spending 88.1% of the time on 4G and only 11.9% of the time on 3G. Free Mobile users spent 24.7% of their time on a 3G network, which may go some way to explaining Free Mobile's lower upload and download speeds in the overall rankings.

On spectrum usage, Free Mobile uses the highest amount of high-band 2600 MHz than any other operator in France, with 58.8% of LTE traffic using this as its primary band, while the other operators hover between 20-25%. The 700 MHz spectrum, which became available to mobile operators back in 2015 as part of a government initiative to shift its digital TV services off the band and allow operators a chance to use it for 4G(5), appears to be predominantly used by Free Mobile and will provide the operator a nice addition of wide area coverage, especially for rural users. It's likely to also offer benefits for in-building performance in built-up areas where higher band spectrum would struggle to penetrate.

(4) Fierce Wireless, Bouygues, Free first to win permits for 4G sites in France's 700 MHz band
https://www.fiercewireless.com/europe/bouygues-free-first-to-win-permits-for-4g-sites-france-s-700-mhz-band
Retrieved 20 February 2020

Mid-band spectrum remains a key workhorse for French LTE traffic. Bouygues uses the highest amount of 1800 Mhz (Band 3) with over 50% of LTE traffic using the band. Orange and SFR also use this more than the other spectrums available with usage rates of 45.6% and 40.1%, respectively.

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Percent of Time by Mobile Connection Type Nationwide

	4G	3G
Bouygues	88.1%	11.9%
SFR	87.5%	12.5%
Orange	83.9%	16.1%
Free Mobile	75.3%	24.7%

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Mobile Data Volume by LTE Band Nationwide

	700MHz	800MHz	1800MHz	2100MHz	2600MHz
Bouygues		800MHz 20.0%	1800MHz 52.1%		2600MHz 25.2%
Free Mobile	700MHz 11.7%		1800MHz 29.3%		2600MHz 58.8%
Orange		800MHz 28.0%	1800MHz 45.6%		2600MHz 21.5%
SFR		800MHz 17.3%	1800MHz 40.1%	2100MHz 17.9%	2600MHz 24.7%

■ 700 MHz APT (Band 28)   ■ 2100 MHz (Band 1)
■ 800 MHz (Band 20)   ■ 2600 MHz (Band 7)
■ 1800+ MHz (Band 3)
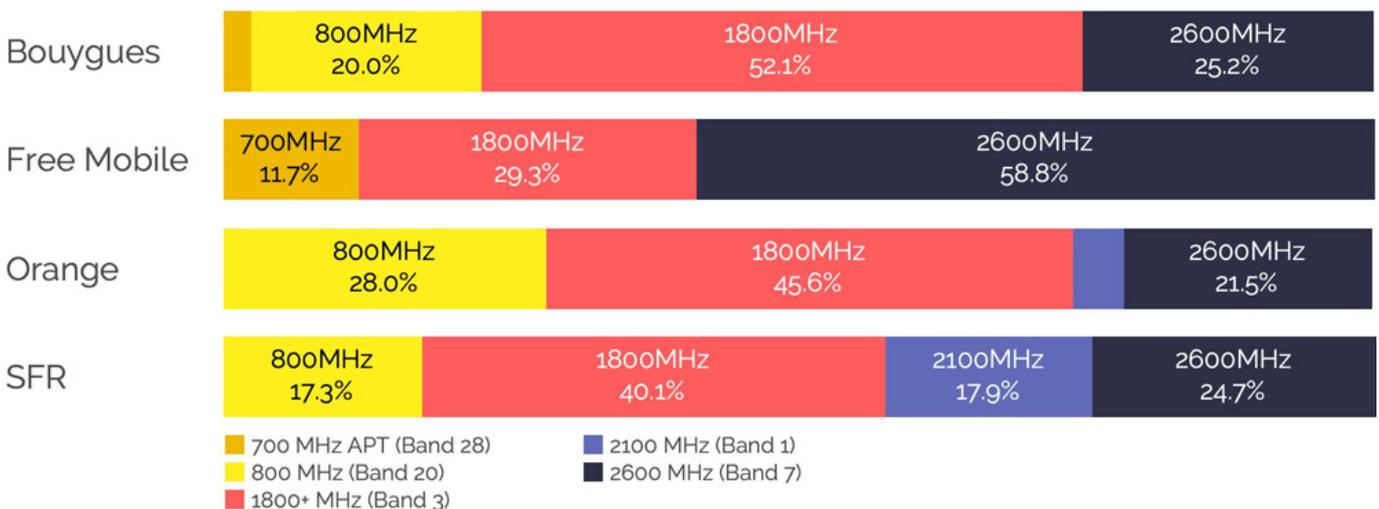
Methodology

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 conducted over over 125 million speed tests, 1 billion latency tests, and over 7 billion total mobile records between August 1st 2019 and January 31st.

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. 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.
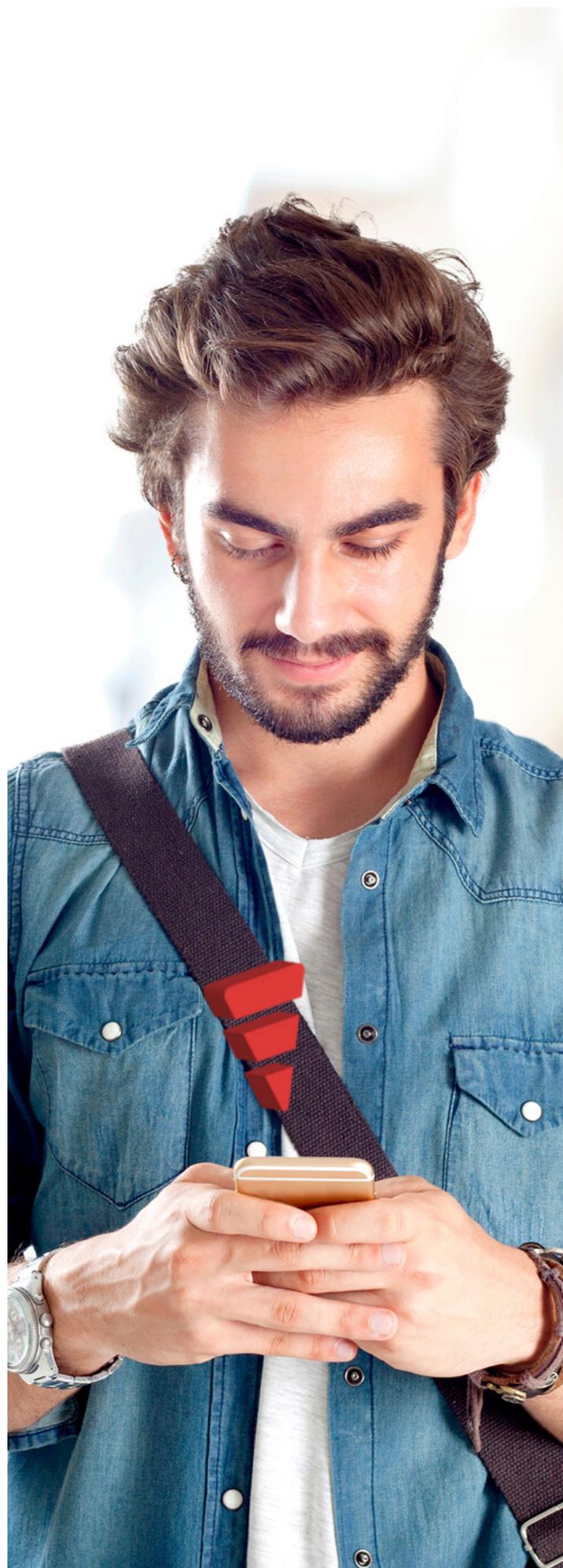
To more objectively evaluate when networks are (and are not) enabling users to do those things, Tutela has developed a standard called consistent quality. Simply put, it's two sets of thresholds, called Excellent and Core. If a connection hits the Excellent standard, it's sufficient for the most demanding 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

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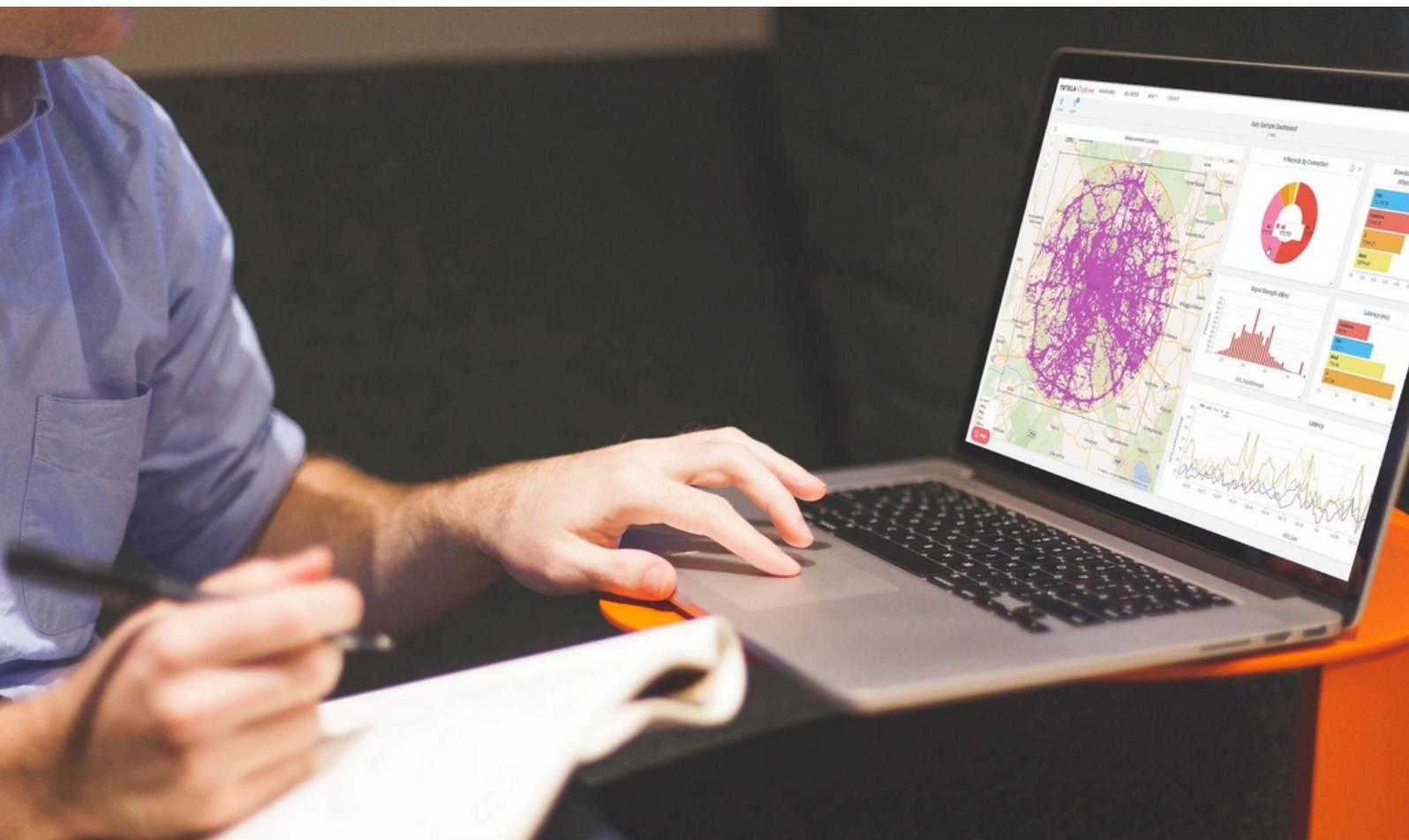
Appendix

TUTELA Common Coverage Areas Results Overview

	Median Download (Mbps)	Download Error Margin (Mbps)	Median Upload (Mbps)	Upload Error (Mbps)	Median Latency (ms)	Latency Error Margin (ms)	Excellent CQ (%)	Excellent CQ Error Margin (%)	Core CQ (%)	Core CQ Error Margin (%)
Bouygues	21.0	0.02	7.3	0.01	13.3	0.00	81.7	±0.04	97.3	±0.02
Free Mobile	12.4	0.02	5.9	0.01	12.7	0.00	71.7	±0.05	94.2	±0.02
Orange	29.8	0.03	8.2	0.01	14.0	0.00	87.3	±0.04	98.1	±0.02
SFR	20.0	0.02	6.7	0.01	14.9	0.00	80.1	±0.04	96.8	±0.02

TUTELA Nationwide Results Overview

	Median Download (Mbps)	Download Error Margin (Mbps)	Median Upload (Mbps)	Upload Error (Mbps)	Median Latency (ms)	Latency Error Margin (ms)	Excellent CQ (%)	Excellent CQ Error Margin (%)	Core CQ (%)	Core CQ Error Margin (%)
Bouygues	20.9	0.02	7.2	0.01	13.3	0.00	81.63	±0.04	97.2	±0.02
Free Mobile	12.4	0.02	5.9	0.01	12.7	0.00	71.63	±0.05	94.1	±0.02
Orange	29.1	0.03	8.1	0.01	14.2	0.00	86.31	±0.04	97.4	±0.02
SFR	19.6	0.02	6.6	0.01	15.1	0.00	79.51	±0.04	96.4	±0.02

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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