

State of Mobile Networks: Canada (January 2017)

From a network perspective, Bell, Rogers and Telus all have more in common than not. All three are fast and offer excellent access to LTE signals to the point no single operator dominated any of OpenSignal's metrics. In our second State of Mobile Networks report for Canada, OpenSignal drew on 289 million datapoints to tease out the differences in 3G and 4G performance of Canada's three major operators.

Bell and Telus share the speed crown

We measured average LTE download speeds on Telus's LTE network of 30.5 Mbps and on Bell's network of 28.4 Mbps, which due to overlapping statistical margins resulted in a draw. We saw a similar tied result in 3G speeds, with Bell and Telus averaging 6.3 Mbps and 6.2 Mbps respectively.

The big 3 are neck-and-neck in 4G reach

While Rogers and Telus were statistically tied for first in our 4G availability metric, the contest was a close one between all three of Canada's national operators with only two percentage points separating them.

Telus stands out in network reaction time

The one area where we had a clear winner was in latency, which measures the responsiveness of a data connection. Telus won both our 3G and 4G latency awards with measurements of 73.2ms and 43.6ms respectively.

Overall, Canada excels in both 4G speed and availability

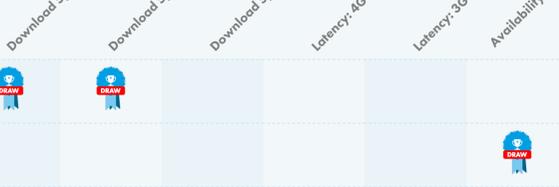
While no Canadian operator may have set itself apart from the others in our speed and availability metrics, all three clearly stood out on the global stage. With nearly 80% LTE availability and speeds pushing 30 Mbps, Canada's big 3 were in the top tier of global 4G performance.

REPORT FACTS



Report Location	Canada
Data Sample Size	289,240,795
User Sample Size	15,272
Sample Period	Oct 1st - Dec 31st 2016

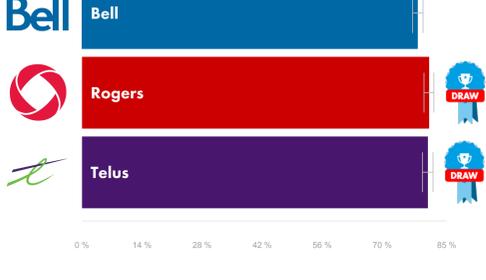
Overall Network Comparison



THE OPENSIGNAL APP: TESTING NETWORK PERFORMANCE ON MILLIONS OF PHONES GLOBALLY

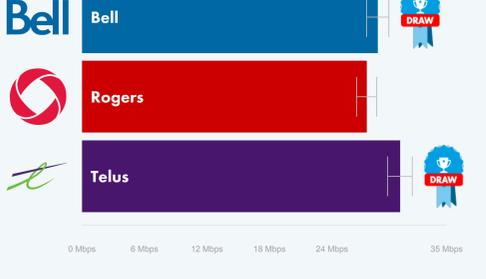
Our app continually runs tests to measure the real world experience users receive. Instead of relying on user-initiated or drive-test simulations, we are able to paint a holistic picture of network's performance through our background tests and crowdsourcing techniques -- all the while protecting the privacy of our millions of active OpenSignal users. The app has been downloaded over 15 million times collecting billions of measurements.

Network Availability Comparison

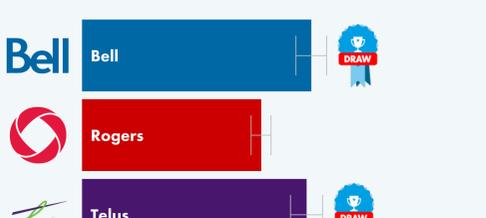


AVAILABILITY: 4G
This metric shows the proportion of time LTE subscribers on each network have a 4G (LTE) connection available to them. It's a measure of the proportion of time users have a 4G signal on a network rather than a measure of geographic or population coverage.

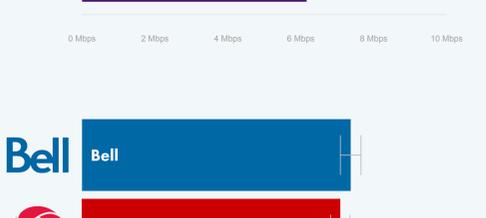
Network Speed Comparison



DOWNLOAD SPEED: 4G
This metric shows the average download speed on each network on 4G (LTE) connections.



DOWNLOAD SPEED: 3G
This metric shows the average download speed on each network on 3G connections.

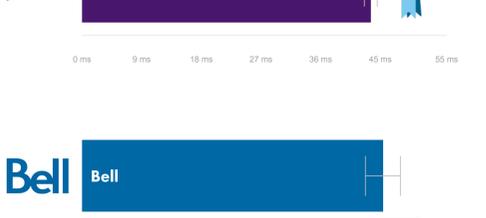


DOWNLOAD SPEED: OVERALL
This metric shows the average download speed experienced by a user across all of an operator's networks. Overall speed doesn't just factor in 3G and LTE speeds, but also the availability of each network technology. Operators with lower LTE coverage tend to have lower overall speeds because their customers spend much more time connected to slower 3G networks.

Network Latency Comparison



LATENCY: 4G
This metric shows the average latency on each network on 4G (LTE) connections. Latency, measured in milliseconds, is the delay data experiences as it travels between points in the network. A lower score in this metric is a sign of a more responsive network.



LATENCY: 3G
This metric shows the average latency on each network on 3G connections. Latency, measured in milliseconds, is the delay data experiences as it travels between points in the network. A lower score in this metric is a sign of a more responsive network.

Analysis

When we last looked at the mobile operators of Canada, OpenSignal found a mobile market with very high performance 3G and 4G networks. A year later, we see Canada continuing down that path of excellence. Not only do our tests reveal mobile data speeds and signal access in the top tier of the world's operators but also a highly competitive market when it comes to mobile network performance. It's not just one standout operator performing well in our metrics; it's all of the big 3.

Since publishing our [last Canada report](#) in 2016, OpenSignal has made some adjustments to both the way we collect data from our smartphone apps and the methodology we use to parse that data. The update allows us to make more measurements, examine new types of network metrics and hone the precision of the measurements we've always collected, helping us isolate the typical consumer mobile experience more effectively (for more details, see [this blog post](#)). The changes haven't affected our overall rankings of networks in Canada or around the world, but for sake of analytical rigor we aren't making any direct comparisons between results collected from the two different methodologies.

For this report we collected 289 million measurements from 15,272 OpenSignal smartphone users to compare the 3G and 4G performance of Bell Mobility, Rogers and Telus. Canada is unique in that it still has many regional operators operating in one or more provinces, but for the purposes of a national report we focused only on the three nationwide providers. Let's start by looking at how accessible those operators' LTE networks are.

A very tight race

In many of our metrics, we found no clear winners given how evenly matched the operators were in our measurements. That closeness was particularly in evidence in 4G availability, which [measures the proportion of time](#) our users had access to an LTE connection. Rogers and Telus shared the award for best availability as OpenSignal testers were able to latch on to their LTE networks just over 80% of the time, but Bell was an extremely close third with a 4G availability score of 78.3%.

We saw another close race in LTE speeds. This time Bell and Telus drew for first place in both our 3G and 4G speed rankings. We measured average 4G download speeds on Bell's LTE network at 28.4 Mbps, while Telus tested at 30.5 Mbps. The 3G result was even closer with a little more than 100 kbps separating them. The results were close enough in both speed categories to produce statistical ties. Rogers, however was by no means slow. We clocked its LTE download speed at 27.3 Mbps, though it did trail more in our 3G measurements. Its 3G download average of 4.9 Mbps was more than a megabit slower than the other two operators' average of 6.2 Mbps. The one speed category where we were able to declare a winner was in overall performance, which measures the typical speed we see across an operator's data networks. Telus's slightly better LTE availability score pushed its overall speed to 24.1 Mbps in our tests, just ahead of its competitors.

It should come as no surprise that Bell and Telus are so evenly matched in speed, considering they share a network. As far as network partnerships go, theirs is quite extensive, not only involving shared towers and radio access infrastructure but also shared spectrum. That said, we wouldn't expect their results to be exactly the same. Both Telus and Bell are traditionally stronger in different regions of the country and in some cases have gone after different subscriber segments. Those different sets of subscribers are reflected in OpenSignal crowdsourced user base and thus reflected in our tests. Also, Bell and Telus may share the radio network, but they maintain different network cores, which can lead to subtle differences in performance, particularly in the final metric we cover: latency.

Latency is a measurement of a network's reaction speed. The lower the latency of a connection is the faster web pages will begin rendering and videos will begin playback. Low latency also means less lag time in real-time communications apps. Telus won in both our latency categories. We measured delays of just 43.5 milliseconds on its LTE connections and 73.2ms on its HSPA links.

Small country; big numbers

Canada's major operators may be closely matched with one another, but on the global stage all three surpass the majority of the world's operators. The slowest Canadian 4G network in our tests was still 10 Mbps faster than the global LTE average connection speed of 17.4 Mbps. All three operators have deployed LTE on multiple frequency bands, and all have upgraded their networks to boost connection speeds with new LTE-Advanced technologies.

In our [last State of LTE report](#), Canada ranked in the top 20 in global 4G availability with an average score of 75.4%. That number factors in the availability of Canada's myriad regional operators, so the average of 4G availability of Canada's Big 3 is closer to 80%. Compared to its more populous neighbor to the south, the U.S., Canada still lags slightly in LTE availability, but it makes up for it in performance. The typical 4G connection in Canada is 26.6 Mbps, nearly twice that of the typical U.S. connection.

METHODOLOGY NOTES

OpenSignal data is collected from regular consumer smartphones and recorded under conditions of normal usage. As opposed to drive-test data, which simulates the typical user experience by using the same devices to measure network performance in a small number of locations, we take our measurements from millions of smartphones owned by normal people who have downloaded the OpenSignal app.

Those measurements are taken wherever users happen to be, whether indoors or out, in a city or in the countryside, representing performance the way users experience it. For more information on how we collect and analyze our data see our [methodology page](#).

For this particular report, 289,240,795 datapoints were collected from 15,272 users during the period: Oct 1st - Dec 31st 2016

All data has been collected from users of the OpenSignal mobile app for Android or iOS.

For every metric we've calculated the statistical confidence interval and plotted this on all of the graphs. When confidence intervals overlap for a certain metric we can't actually be sure which of the overlapping operators has the best performance.

For this reason some metrics have multiple operator winners when we've judged that the data is too close to call a victory.