CONNECTED NORTH

The Speed of Northern Ontario Broadband

Prepared by Blue Sky Net

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The following report is a summary of findings collected from users that ran speed tests at www.connectednorth.ca between Oct. 2015 and April 2020. The results of individual speed tests can be impacted by a variety of factors both inside and outside the tester's premises that is beyond the control of the network or network operator as well as the internet service provider. Device used, router, cabling, distance from wireless router, number of users using the access point, background software and viruses are all examples of factors that can affect internet performance as well as speed test results.

OVERVIEW

In late 2015 Blue Sky Net launched connectednorth.ca as part of its Broadband and Associated Infrastructure Mapping and Analysis Project (BAIMAP) initiative. Connectednorth.ca was intended to provide visitors to the site with useful information about broadband access in Northern Ontario. It was especially helpful to those who experience challenges in obtaining access due to availability, or lack thereof. Since the beginning, connectednorth.ca drew on the BAIMAP database as a key feature to develop a broadband availability search engine where visitors can search a civic address for available broadband service providers at that location, what kind of internet is available, as well as anticipated speeds and contact information for the Telecommunication Service Providers.

Shortly after the launch of connectednorth.ca, an Internet speed test module was also incorporated in the front page of the site. As important as it was to provide visitors information related to connectivity, Blue Sky Net also felt strongly that there was an opportunity to collect information from the website visitors as well.

The intent of the speed test has been to provide real-time feedback of Internet performance to the site's visitors in real time, while also collecting that same information for analysis and interpretation. From the outset, it was intended that the visitor speed test information was going to be collected and used to inform decision makers about the realities of Internet access in Northern Ontario.

While the BAIMAP database consisted largely of coverage information provided by Telecommunication Service Providers (TSP's), it was felt that sampling performance results from Internet users would provide an interesting and valuable cross-reference of user experience versus promoted or advertised speeds. It should be noted that the speed test does not collect TSP information or IP addressing, it only links speed test results to user-entered addresses, as well as user-entered service type. The intent of the data is not to contradict TSP-provided information, but to compare the realities of promoted speeds versus user experience.

From late 2015 there have been just over 4,500 speed tests completed that can be verified and 4,330 within Northern Ontario. To date, connectednorth.ca has used the Speedofme platform with the test server located at a key interconnection point in Sudbury. The Speedofme platform was selected for several reasons, including because it was built with HTML5 the test looked similar and performed the same, across all browsers and devices. Speedofme also uses a testing methodology that does not overwhelm limited connections, making the test as fast for someone connecting with .5 Mbps as it does for someone connecting at 50 Mbps. With every speed test there are limitations, however due to the high number of test results received from connectednorth.ca, the test results provide useful insight into averages of upload and download speeds for those in Northern Ontario.

SUMMARY OF SPEED TEST RESULTS BY COMMUNITY AND SERVICE TYPE FILTER

Of the 4,330 speed tests recorded within Northern Ontario, the average download speed was just below 9 Mbps and the average upload speed was just above 5 Mbps. The interactive summary table at connectednorth.ca/speed-test-report provides a summary table of these test results. Listed are 101 communities that logged a minimum of five tests within each community. Each community can be searched using the search bar to the right of the table. The default results view of the table is displaying all speed test results regardless of service platform. Results can be filtered by selecting the individual service types (Fibre, DSL, Fixed Wireless, etc.), or by selecting any combination of them.

Of the 101 individual communities logging at least 5 tests, only 30 have an average download speed above the overall Northern Ontario average. Although there are some surprises on the list, most of these communities are amongst the larger and most densely populated communities. This relationship is explored in more detail further down.

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In 2018 the CRTC issued a target to connect over 90% of Canadian households to services that can deliver 50Mbps down / 10Mbps up by 2021. Most federal and provincial broadband funding programs also hold this standard. It is interesting to note that very few communities' speed test averages approach these speed targets.

The communities in the top five number of speed test results all have actively engaged citizens to conduct speed tests through mail-out communication or social media. For example, the community of East Ferris (568 tests) and its council have been long-time advocates for improving connectivity to their community and have actively reached out to their citizenry to participate in any means necessary to communicate the need for better Internet service.

It should be noted that, in general, people do not conduct Internet speed tests to confirm how strong or fast their Internet connection is. Speed tests are generally a sampling of people who have limited service or are concerned about the performance of their service. The reasons why any particular connection may or may not be performing adequately are beyond the scope of this report.

RELATIONSHIP BETWEEN COMMUNITY SIZE AND INTERNET PERFORMANCE

This chart illustrates a relationship that is already well understood; larger communities have better broadband access and more options. Speed tests initiated from the seven communities that are designated as "cities" on average, registered results that were over twice as fast as speed tests registered for all other communities. Although the connection between community population and Internet performance is known, the reasons for the relationship may not be quite so well known.

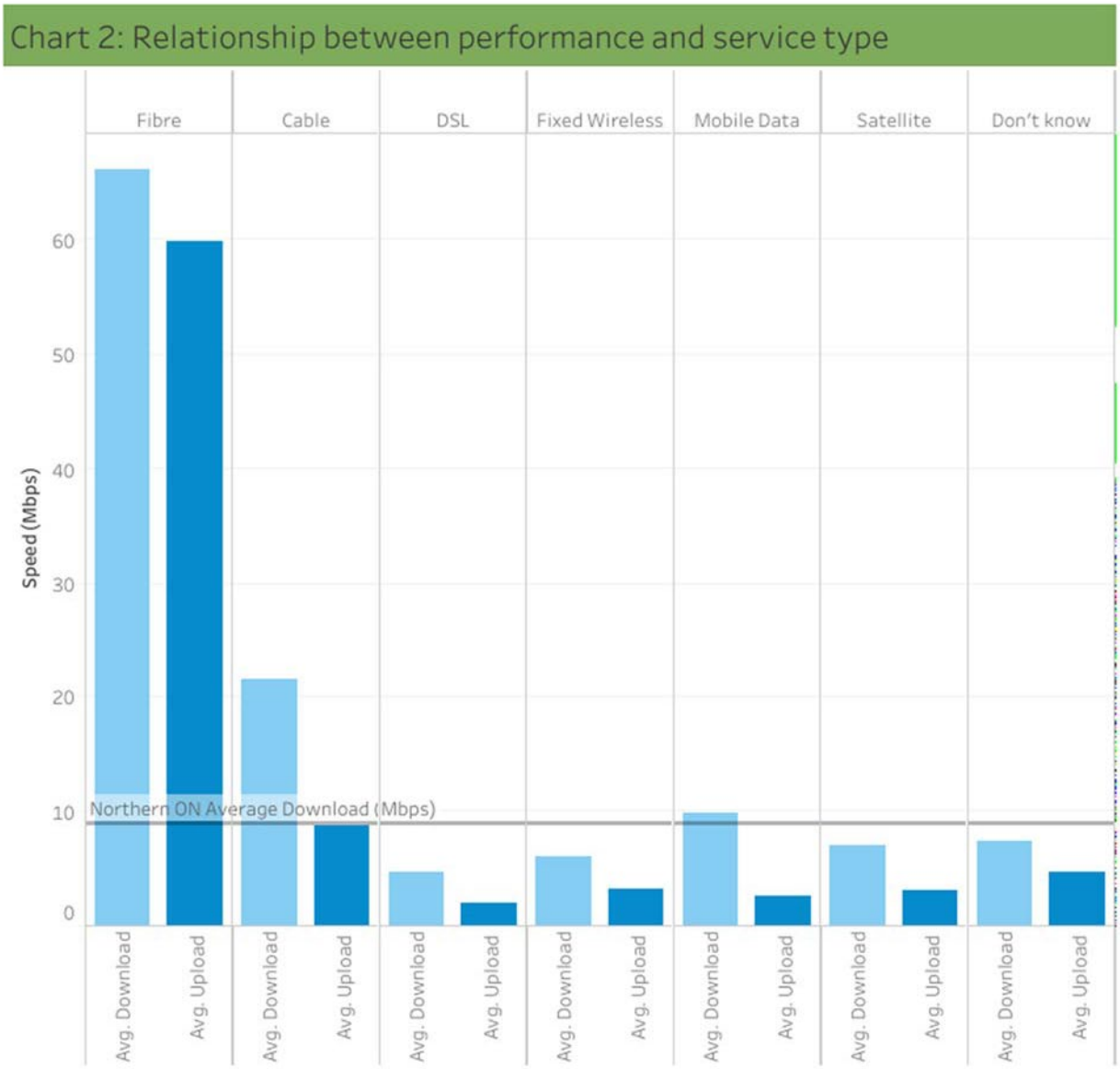


Chart 2: Relationship between performance and service type, www.connectednorth.ca/speed-test-report

Larger communities represent a better return on investment to ISPs to build networks, therefore more services are built, and more options exist to the consumer. Not only do cities tend more populated they also tend to be denser, meaning there are more

people (potential customers) per square kilometer. From an infrastructure perspective it is considerably more cost effective to run 1km of fibre optic cable to serve 100 customers than 1 km of fibre to serve half a dozen. This factor also influences the type of service or platform" that delivers customer connection over the last mile. "Wired" connections are more expensive and require leasing of infrastructure and right of ways but are more stable and faster.

Wireless networks (specifically fixed wireless, satellite and mobile data) require an access point (tower/spacecraft) and a customer within range of the access point. These technologies are more economical in less dense areas, but traditionally can't deliver the top end performance customers now need.

Looking again at the numbers on the right, it can be further interpreted that although the overall average of speed tests in Northern Ontario is 9/5Mbps, the average for speed tests initiated from every community other than the seven cities is just above 7/3 Mbps.

RELATIONSHIP BETWEEN PERFORMANCE AND SERVICE TYPE

Not all Internet services are created equal! Again, at the outset it was noted that Internet speed tests typically test those who are having issues with their connectivity, rather than those who are generally pleased with it. That said, some 80 speed tests were logged by visitors indicating that they were connecting via fibre to the home (FTTH). Unsurprisingly this was by far the fastest of the six platforms that were identified by users.

At more than twice the pace of the next fastest service type, FTTH customers experienced an average download speed of 66 Mbps down and almost 60 Mbps upload. One question worth considering is that because fibre is capable of much greater speeds than 66 Mbps, it is possible that these fibre users were experiencing network problems either within their local network or over the network's last mile?

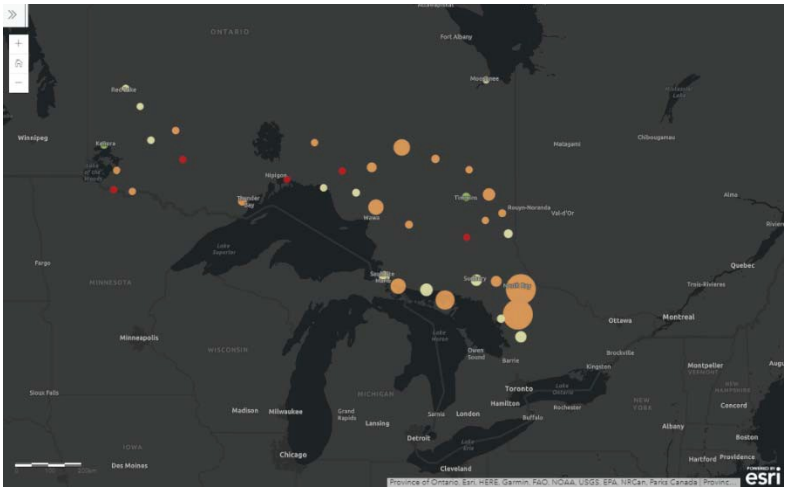
190 tests were initiated indicating a cable modem service with an average download of 21.5 Mbps and just under 9 Mbps upload. These numbers fall in the lower end of typical services from cable networks and are not unexpected.

The remaining four service types of Mobile data, Satellite, Fixed Wireless and DSL all came within a close margin to one another. Mobile delivering a download of 9.9 Mb per second or just over the Northern Ontario average. At the bottom is the 537 tests registered for DSL service. DSL at one point was by far the most common service platform and remains popular but is being replaced by FTTH in urban communities. DSL, which is delivered over (in some cases) very old copper telephone networks is prone to network congestion as well as being affected by the condition of the infrastructure itself. DSL customers on the same loop can experience a wide range of service quality.

Lastly, it is important to note that over 2,000 speed test users did not indicate their service platform. In late 2017 connectednorth.ca moved to a slightly different interface and began collecting the "service type" class. It is also important to note that not all customers know exactly how their service is delivered to them, nor should they.

CONNECTEDNORTH.CA INTERACTIVE SPEED TEST MAP

When you review the connectednorth.ca interactive speed test map, zoom in to North Bay or Sault Ste. Marie and you will see the same thing happen in almost every other major urban centre in Northern Ontario. Within city limits clustered circles will appear shaded in light green to darker green representing speed tests measuring download speeds of at least 25 Mbps. Typically, these clustered circles are small to medium sized representing 90 or less speed tests run. Just outside of the cities these clustered circles are shaded orange or red representing much slower download speeds and typically the clusters are larger indicating many more speed tests conducted because many more people are concerned about the performance of their home or business Internet connections.



The map is structured so that every 4,330 speed tests that were run in Northern Ontario are represented in a group or clustered circle. Clicking on the clusters will reveal the number of tests as well as the average download speed within the geographic boundaries of that cluster. The closer one zooms in on the map the clusters separate into fewer subgroups with greater geographic precision until eventually most points represent only three or four results and, in some cases, even a single speed test. This method was selected to provide as much geographic specificity without revealing exact location of where the tests were initiated.

The map is simple by design with few buttons for navigation control. On tablets or phones zoom control can be done with finger swipes and discovery of speed test values can be done by tapping the clustered circles. If reviewing the map on a web browser on a laptop or desktop scroll zoom is enabled and results can be viewed by clicking on the circles as well. A simple ledger is revealed by tapping or clicking the double arrows on the top left of the map.

CONTACT

For questions about the information displayed on the map, or about any of the information in the report or the tables, please email Blue Sky Net Project Manager, Jeff Buell, at jeff.buell@blueskynet.ca. To participate in the information collecting process, please visit the speed test on connectednorth.ca by clicking here.