



Measuring Australia's fixed broadband performance

November 2020

The context for this work

Fixed broadband plays a vital role in connecting Australians, and significant public investment has been made to develop fixed broadband infrastructure with the rollout of the NBN. Fixed broadband is and will remain an important part of Australia's broadband infrastructure, particularly given the high proportion of traffic it carries (just under 90% of all downloads) and is expected to continue carrying. It is therefore important that the performance of Australia's fixed broadband infrastructure is known and comparable to our international peers, especially in the COVID-19 environment.

While existing international comparisons provide useful insights, data availability and challenges in comparing like for like indicators across countries mean that they do not always provide an accurate picture of Australia's relative performance. In particular, existing measures fall short in enabling comparisons between countries with similar economic compositions, technology, population and geographic features.

'Speed test' comparisons are often cited as a key measure of fixed broadband performance. However using speed tests based on experienced download speed as the only metric for comparison can be misleading as they do not account for many of the factors that can influence internet performance.

In light of the above and to provide transparency on Australia's relative performance, the Department of Infrastructure, Transport, Regional Development and Communications (the Department) will monitor indicators that are relevant to fixed broadband in Australia, and make comparisons to countries with similar economies and geography. The methodology has been developed by PricewaterhouseCoopers Australia (PwC), which provided an independent assessment of the strengths and limitations of existing measures and proposed a transparent and robust basis for ongoing monitoring.

The findings from the new methodology will be published by the Department's Bureau of Communications, Arts and Regional Research (BCARR) in a series of fact sheets, with the indicators able to be updated over time.

Issues with commonly used broadband comparisons

Existing measures do not provide like-for-like comparisons

No country is easily comparable to another. For example, by global standards, Australia is wealthy and highly urbanised, but our population is also spread across a vast landmass. Our income and geography mean that Australia is more readily comparable with Canada than with city states like Singapore, or densely-populated countries such as the United Kingdom.

Existing international comparisons are generally not able to make meaningful like-for-like comparisons between countries. They do not take into account that differences in performance observed between countries may reflect differences in the characteristics of countries (such as geography or population density). This means that performance differences offer very limited measures of actual country performance.

There are limitations to existing speed tests

International comparisons of broadband performance tend to focus on comparing countries based on tests of 'average experienced download speed'. Speed tests, which measure the speed experienced, have a number of limitations that affect how they are interpreted.

First, the results are affected by a range of factors including congestion, the speed of a user's broadband subscription plan and the technical configuration of the test itself.

Methodological factors also impact a user's experienced speed. These include collection factors such as the time and frequency of measurement, location of measurement (such as the customer's premises, or at another point in the network), how the user has configured their access to the network, and how the measurement itself has been designed.

Cross-country comparisons can also be limited by sampling differences, such as the size and cohort of users sampled in broadband performance measures. For example, in some countries there are several million speed tests conducted every month, whereas in other countries there may only be a few hundred speed tests conducted over the same period. Further, some speed tests allow the inclusion of results even from quite small samples. This means the results are not able to be compared consistently as smaller sample sizes are less likely to be representative of whole-of-country results.

Speed alone is not a sufficiently useful measure to assess fixed broadband performance

The term broadband performance can be used to refer to many aspects of broadband experience—from the speeds possible on broadband infrastructure to the real-world speeds experienced by users. Broadband performance can also refer to network coverage, population uptake, data usage and reliability within a country.

Experienced speed measures, on their own, have limited relevance for understanding and assessing fixed broadband performance. Other elements of broadband performance include the speeds users subscribe to, network coverage, uptake of broadband services, network congestion at the test time and the quality of in-home networks.

A new approach to compare Australia's broadband performance

The new suite of measures developed by PwC address the shortcomings with existing measures and provide a more robust way to compare Australia's broadband performance against similar countries. The measures were developed following a review of existing international comparisons and consultation with key sector regulators and industry experts in Australia and internationally.

The new suite of measures enables more like-for-like comparisons across countries, and provide a broader range of relevant measures for assessing fixed broadband performance.

Like-for-like comparisons

The new methodology incorporates countries against which Australia can most usefully be compared. In developing the list of comparable countries, a range of factors were considered, including economic composition, geographical distribution of population, and population size.

- **Economic composition:** A country's ability to replicate policies/practices that promote improved broadband performance will be driven in part by the similarity of that economy to others. A similar economic composition is also correlated with similar regulatory constraints, decision-making processes and trade-offs around investment. GDP per capita is used to capture a country's economic composition.
- **Geographic distribution of population:** The spread of people has important implications for the costs and complexity required to build and maintain a fixed broadband network, and therefore the ability to replicate policies/practices related to broadband performance. This is particularly relevant for Australia, which has a sparse population in parts of the country. Population density is used to capture a country's geographic distribution of population.
- **Population size:** The size of a country's population is also likely to contribute to the relative cost and resources required to build and maintain a fixed broadband network, and therefore the ability to replicate policies/practices around broadband performance. Population is used to capture a country's size.

Based on the above approach, a list of 20 comparable countries has been developed. These are listed at [Appendix A](#).

Fixed broadband performance measures

In the context of the issues described above, the following have been identified as indicators for fixed broadband performance:

- **Coverage** measures—these indicate the opportunity for citizens to access the benefits facilitated by a broadband connection. Accessibility is expected to be particularly important in the context of the digital divideⁱ—widespread access to fixed broadband can be considered to represent good broadband performance, given it is a key requirement to enabling all citizens to experience the social and economic benefits of the digital economy.
- **Minimum speed** measures—this indicates whether the overall user experience is improving. Where consumers have reliable access to higher subscription speed tiers, this will represent a positive outcome where speed brings improvements to the quality of experience.
- **Uptake of higher speed plans** measures—this is another measure of user experience, but also indicates that citizens are aware of the social and economic benefits of fixed broadband. Actual uptake of broadband is also important to understanding coverage—it is fundamentally linked to citizens realising the social and economic benefits of fixed broadband. Therefore, good broadband performance may be associated with high levels of broadband utilisation.
- **Data usage**—this is an outcome measure that conveys the overall extent to which citizens are realising the benefits of fixed broadband, and how the network is being utilised. As one indicator for how much broadband is being used, greater levels of usage may reflect greater realisation of broadband's benefits and therefore be an indication of good performance.

ⁱ The 'digital divide' refers to gaps in access to information and communication technology contributing to poorer outcomes amongst some cohorts.

Appendix A: List of countries for international comparison of broadband performance

Country	GDP per capita	Population	Population Density
Switzerland	\$82,839	8,516,543	215.5
Norway	\$81,807	5,314,336	14.6
Ireland	\$78,806	4,853,506	70.5
Qatar	\$69,026	2,781,677	239.6
United States	\$62,641	327,167,434	35.8
Denmark	\$60,726	5,797,446	138.1
Australia	\$57,305	24,992,369	3.2
Sweden	\$54,112	10,183,175	25.0
Austria	\$51,513	8,847,037	107.2
Finland	\$49,648	5,518,050	18.2
Germany	\$48,196	82,927,922	237.4
Belgium	\$46,556	11,422,068	377.2
Canada	\$46,211	37,058,856	4.1
United Arab Emirates	\$43,005	9,630,959	135.6
United Kingdom	\$42,491	66,488,991	274.8
New Zealand	\$41,966	4,885,500	18.6
Israel	\$41,614	8,883,800	410.5
France	\$41,464	66,987,244	122.3
Japan	\$39,287	126,529,100	347.1
Italy	\$34,318	60,431,283	205.5

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