



# Measuring Broadband Australia

## Monthly report (November 2020 to<sup>1</sup> January 2021)

In 2017, the Australian Competition and Consumer Commission (ACCC) launched its project to measure internet performance. SamKnows was appointed to supply their Whiteboxes to internet users in Australia to measure the quality of experience for fixed-line internet.

The goal of the Measuring Broadband Australia project is to increase transparency and encourage greater performance-based competition and better internet performance throughout the country.

SamKnows prepares these reports for publication by the ACCC each quarter. The metrics are also presented by the ACCC in a public dashboard at <https://www.accc.gov.au/consumers/internet-landline-services/broadband-performance-data>.

The program tests fixed-line services as a main focus, however in this report we have included fixed wireless services analysis as well.

# Overview

November - December - January  
2020 - 2021

This is the fourth monthly report issued as part of the Measuring Broadband Australia program. This report tracks the performance of NBN fixed-line services and fixed wireless services from November 2020 to January 2021. The monthly reports responded to the COVID-19 pandemic to provide timely information on the impacts to network performance from social distancing measures. This fourth report concludes a year period from February 2020. We intend to integrate the data included in this report into the quarterly reports going forward.

In this report we present daily average download figures for the following NBN fixed-line download speed plans:

- 100 Mbps
- 50 Mbps
- 25 Mbps

And the following fixed wireless plans:

- Fixed Wireless Plus
- 25 Mbps

## Differences between NBN fixed-line and NBN fixed wireless connections

NBN fixed-line connections and NBN fixed wireless connections utilise different technologies that are not directly comparable in terms of performance. An NBN fixed-line connection utilises a physical line running to the household to connect it to the NBN network. There are a number of fixed-line technologies: fibre to the premises, fibre to the building, fibre to the curb, fibre to the node and hybrid fibre coaxial cable.

An NBN fixed wireless connection transmits data over radio signals to connect a household to the NBN network and uses similar technology to mobile networks.

NBN typically uses this type of service in regional and remote areas, where the distance between households can be many kilometres, but outer metropolitan centres may also use NBN fixed wireless. Data travels from a transmission tower to an outdoor antenna fitted at the household. Each fixed wireless tower has one or more 'cells' containing the equipment that transmits signals to a dish or the outdoor antenna at a customer's home or other premise, allowing them to connect to the internet. NBN fixed wireless serves around 4 per cent of NBN consumers.

The quality and maximum speed of a fixed wireless connection is often more variable than fixed-line technology.

The following environmental factors may affect fixed wireless:

- the distance of the consumer's premises to the fixed wireless tower
- whether there is a clear line of sight between the antenna on the roof of the premises and the fixed wireless tower, or if there is an obstruction, such as foliage
- weather conditions such as extreme heat or heavy rain

Another factor that may affect the performance of services provided over fixed wireless is network congestion. Each fixed wireless cell has a finite amount of capacity (e.g. a certain number of megabits per second, or Mbps), which is shared between the households connected to that cell. Where more households in an area connect to a particular cell and/or those households increase their usage towards the limits of the cell, this can cause the cell to become congested. The impact of network congestion on the fixed wireless network is typically most noticeable during the busy hours (between 7pm and 11pm).

For further information on using NBN fixed wireless, see <https://www.accc.gov.au/consumers/internet-landline-services/broadband-speeds/using-nbn-fixed-wireless>

## Results presented in this report

The daily averages are calculated by aggregating raw test results by Whitebox, plan speed and day, with this then being averaged across all Whiteboxes for each plan speed.

Additionally, we have presented the percentage change in average daily download speeds for each fixed-line plan against a pre-COVID-19 February 2020 average baseline.

For this monthly Measuring Broadband Australia key indicators report, calculations have been conducted for all hours and busy hours (7pm - 11pm) from Monday to Sunday. For fixed-line services this is excluding underperforming<sup>1</sup> and impaired units<sup>2</sup>.

All charts use a consistent set of Whiteboxes across the entire reporting period. If a Whitebox changed speed tier during the period, it is excluded.

## Impacts and events relevant to the test period

This report brings to a close a full year of covering the unprecedented impact of the COVID-19 pandemic on NBN services. As covered in previous reports, the information below specifies a number of actions taken in response to COVID-19, that have had a large impact on results allowing for a comparison for the state of broadband services from that pre-pandemic starting point. In response to increased demand and change in usage of online applications due to COVID-19, NBN Co:

- Provisioned more connectivity virtual circuit (CVC) capacity for retail service providers (RSPs). The full amount of this additional capacity was available to RSPs until 30 November 2020. In December 2020, NBN Co tapered the CVC boost to 75 per cent of the initial amount and 50 per cent of the initial amount in January 2021. This is applicable to fixed-line and fixed wireless NBN services.
- Over-provisioned the download component of some NBN speed tiers by around 10 – 15 per cent where possible. This was being implemented over the period between June and August 2020, and the impact has already been detailed in previous reports. the distance of the consumer's premises to the fixed wireless tower.

1. We classify a service as 'underperforming' if no more than 5 percent of speed tests that we conducted over the service achieved a speed that was above 75 percent of maximum plan speed. This test effectively identifies those services with maximum attainable speeds that fall closer to the maximum speed of a lower speed tier than to the maximum speed of the consumer's current plan.

2. Impaired services are those where NBN Co provides us with the information that maximum plan speed cannot be attained due to physical limitations.

The unprecedented demand during COVID-19 has required additional checks of the MBA test data. This is so that we can remain confident that the metrics that we are reporting accurately show the speed and quality that is available to consumers when using their broadband service to access popular online content and applications.

These checks led us to believe that on some days the speed tests that we conducted in New South Wales could have likely been impacted by congestion that occurred on the data network that hosts those test servers, which a consumer would be unlikely to have encountered in their own use of their broadband service. Due to this we have established new test servers in New South Wales (Sydney) that are hosted on a separate data network. These new servers were established on 3rd November and data from them is included in this report. No data from the previous servers hosted in New South Wales are included in this report, therefore no data from New South Wales is reported for the first two days of the reporting period.

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## Note

- Monthly data presented should not be directly compared with corresponding data in the quarterly reports as the composition of sample sizes may vary between the quarterly and monthly report.
- 12/1 Mbps services are excluded from monthly reporting due to the limited sample size.

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# Monthly report

November - December - January

2020 - 2021

## Fixed-line services

Figures 1 and 2 track the average daily download speeds by plan for the period of November 2020 to January 2021. Both charts exclude impaired and underperforming units.

Network performance is broadly stable for all plan speeds, during all hours, while during busy hours there is more variability.

Figure 1: Average Daily NBN download speeds during all hours by plan

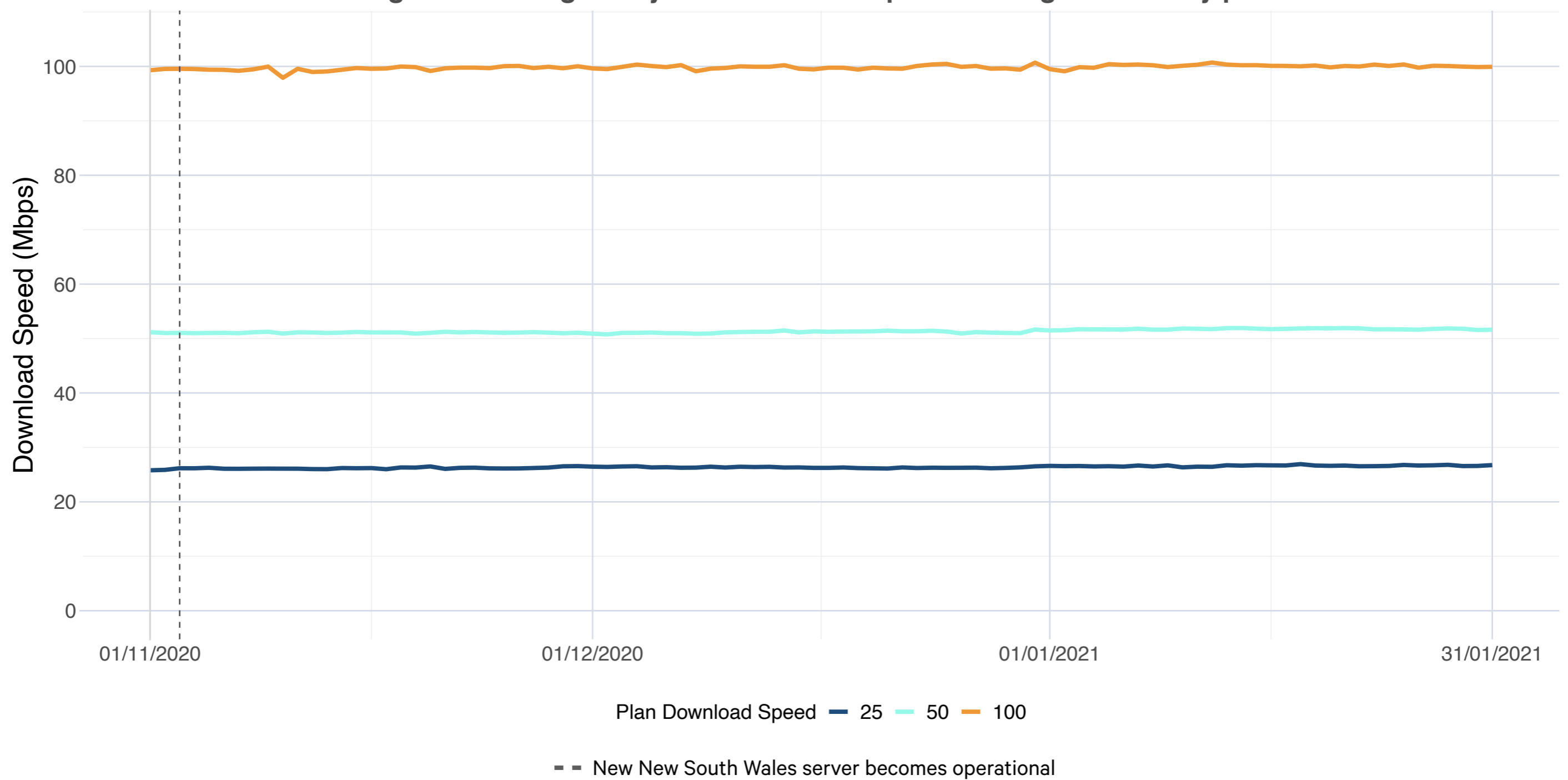
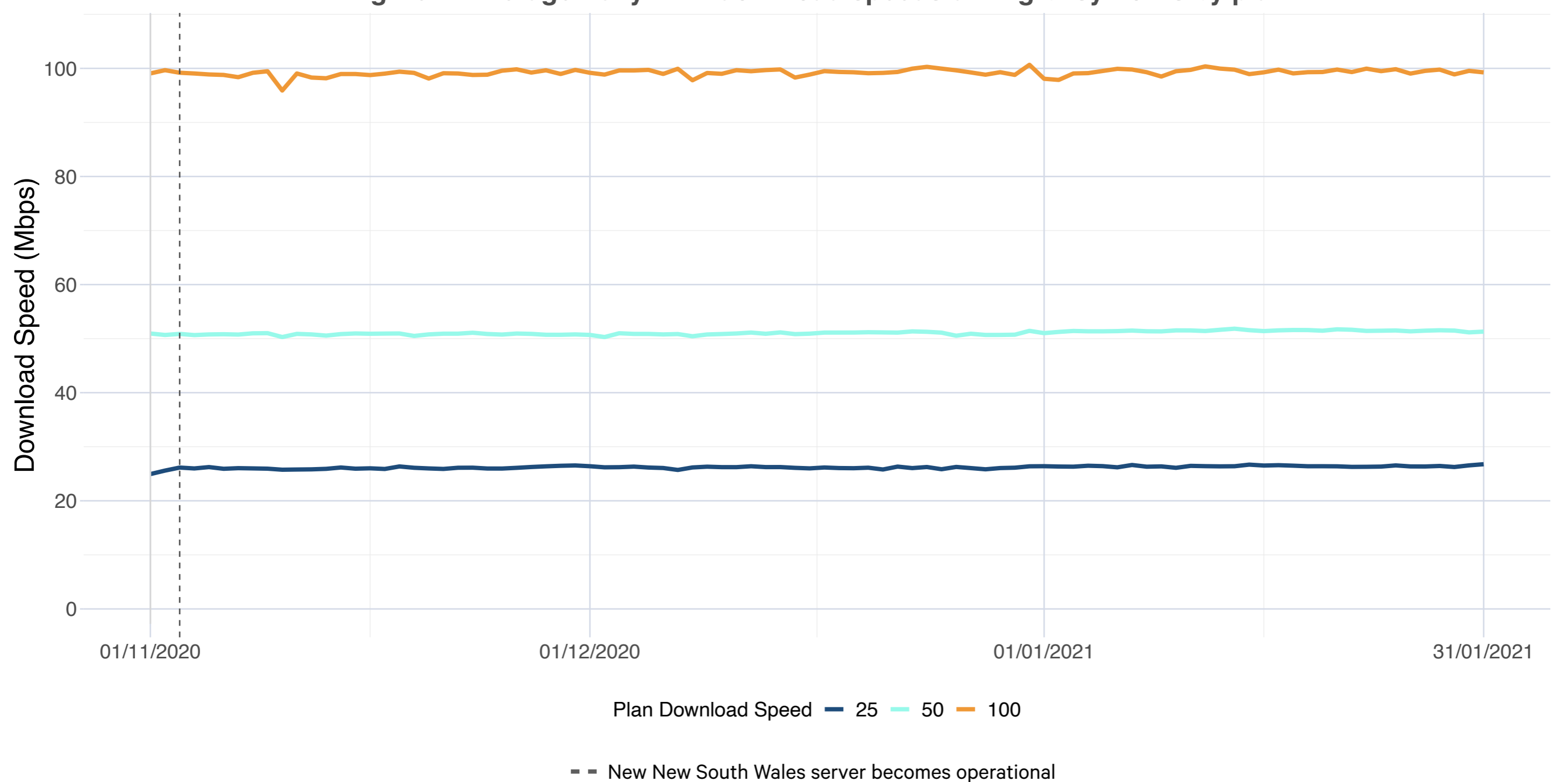


Figure 2: Average Daily NBN download speeds during busy hours by plan

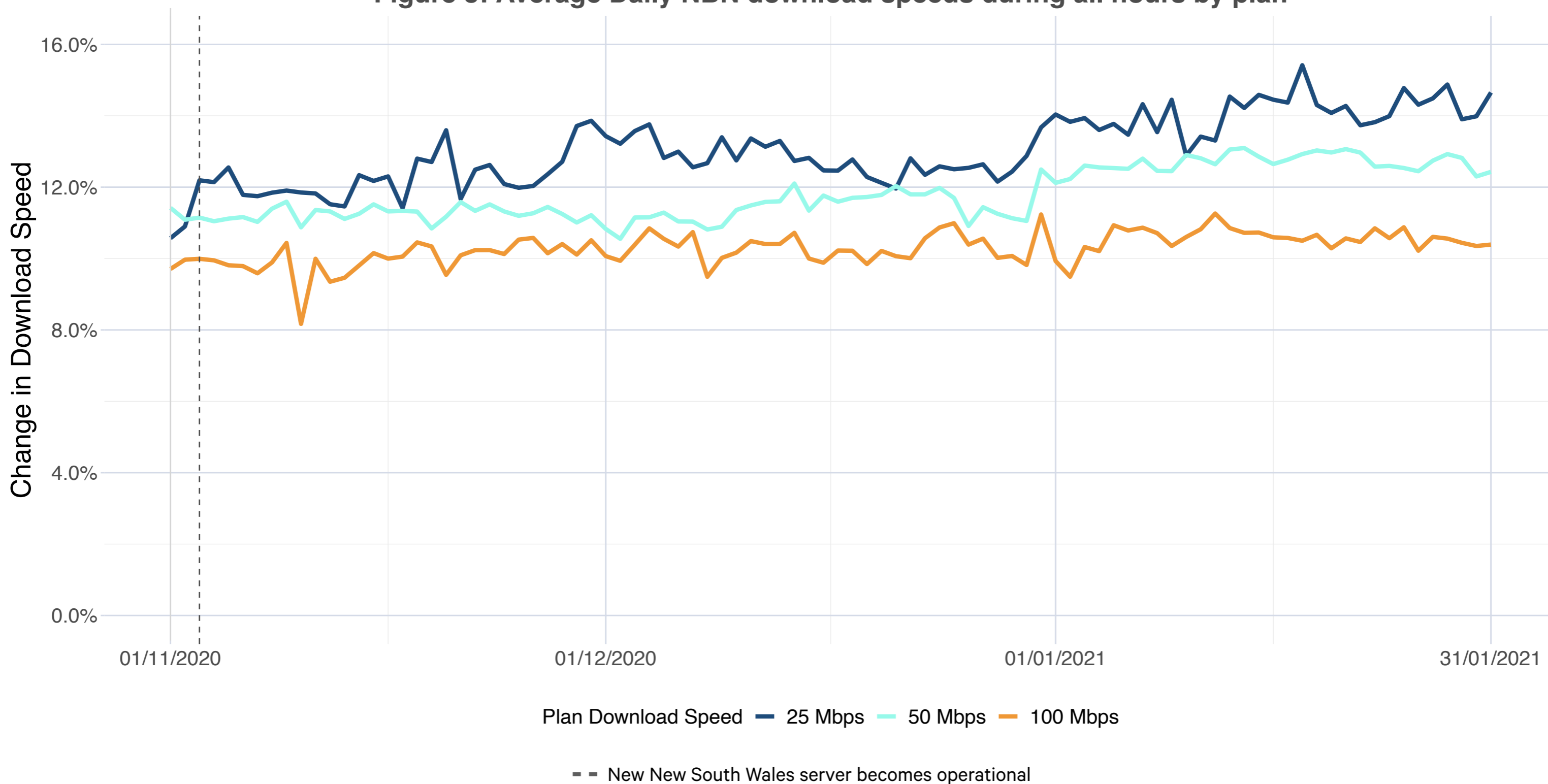


Figures 3 and 4 track the percentage change in download speed recorded each day over the period by plan speed and compared against a pre-COVID baseline of February 2020. Both charts exclude impaired and underperforming units.

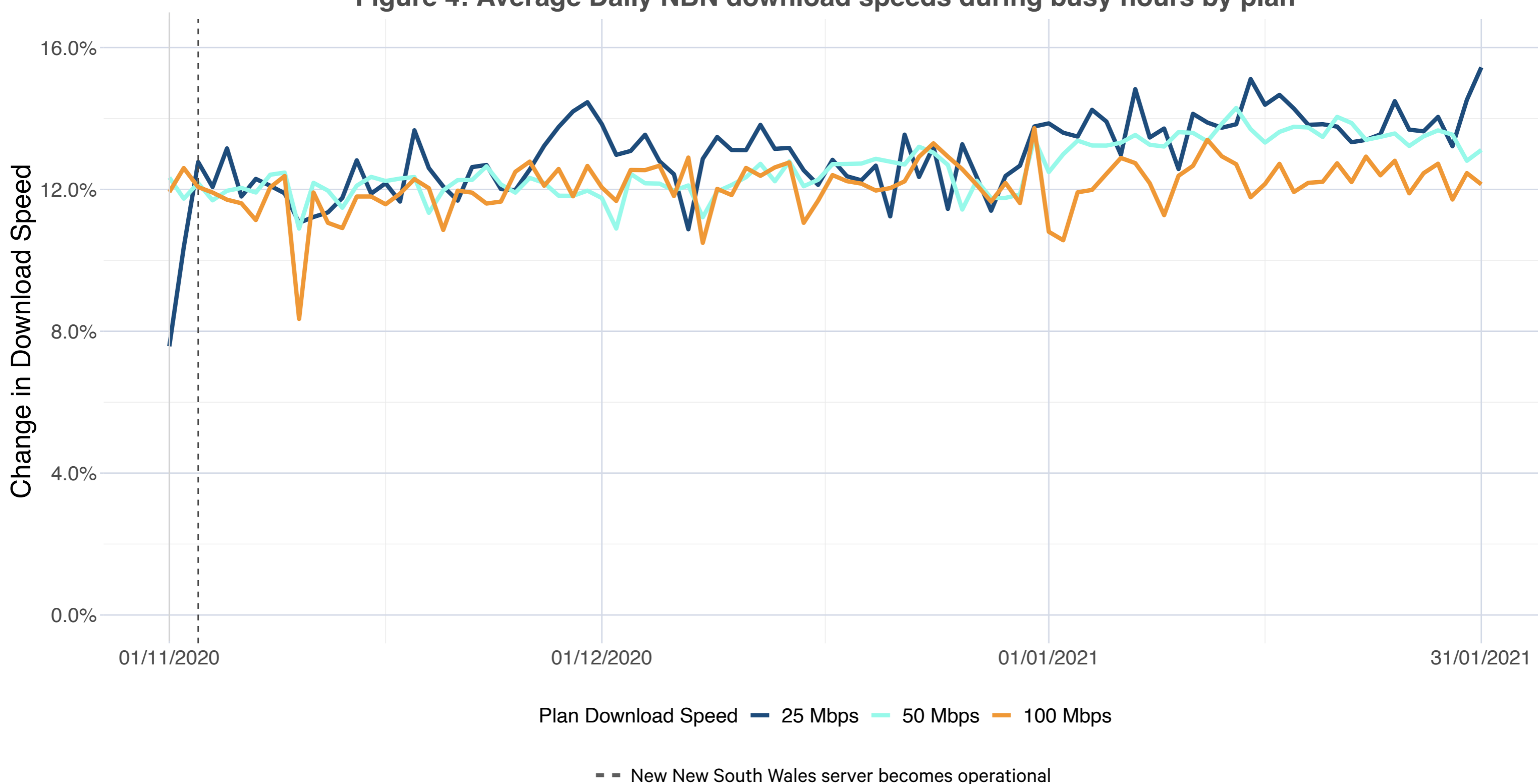
During all hours (figure 3), download speeds for the period were consistently above the February 2020 pre-COVID baseline, due to the over-provisioning which was implemented from between June and August 2020. Performance was broadly stable over the period, although the 25 Mbps and 50 Mbps plans both finished the period higher and spent all of January, at least 12% above their baseline levels.

Network download speed performance during busy hours follows a similar pattern to that of all hours. All tiers were consistently above their baselines (between 8 and 16%) with the 25 Mbps and 50 Mbps plans further improving in January 2021 compared to the February 2020 baseline.

**Figure 3: Average Daily NBN download speeds during all hours by plan**



**Figure 4: Average Daily NBN download speeds during busy hours by plan**



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2020 - 2021

## Fixed wireless services

Figures 5 and 6 track the average daily download speeds by plan for fixed wireless units for the period of November 2020 to January 2021. These fixed wireless units comprise both 25 Mbps and Fixed Wireless Plus speed plans.

During all hours, performance of the 25 Mbps plan is more stable with a daily average download speed just under 20 Mbps. The Fixed Wireless Plus plan oscillates around 40 Mbps average download speed during all hours. During busy hours, performance of both plans is lower and variability in daily performance is slightly higher. In particular, the Fixed Wireless Plus plan oscillates at around 30 Mbps during the busy hours. Despite this busy hour speed reduction, this is an improvement compared to the previous monthly report, where Fixed Wireless Plus plans during busy hours were generally lower compared with this report.

Performance is more variable when compared to fixed-line services and this can be explained by the inherent increased variability in fixed wireless products compared to fixed-line fibre and the smaller sample of fixed wireless Whiteboxes. The results presented here are solely indicative and firm conclusions about the performance of fixed wireless products should not be inferred from these results.

Figure 5: Average Daily Fixed Wireless download speeds during all hours by plan

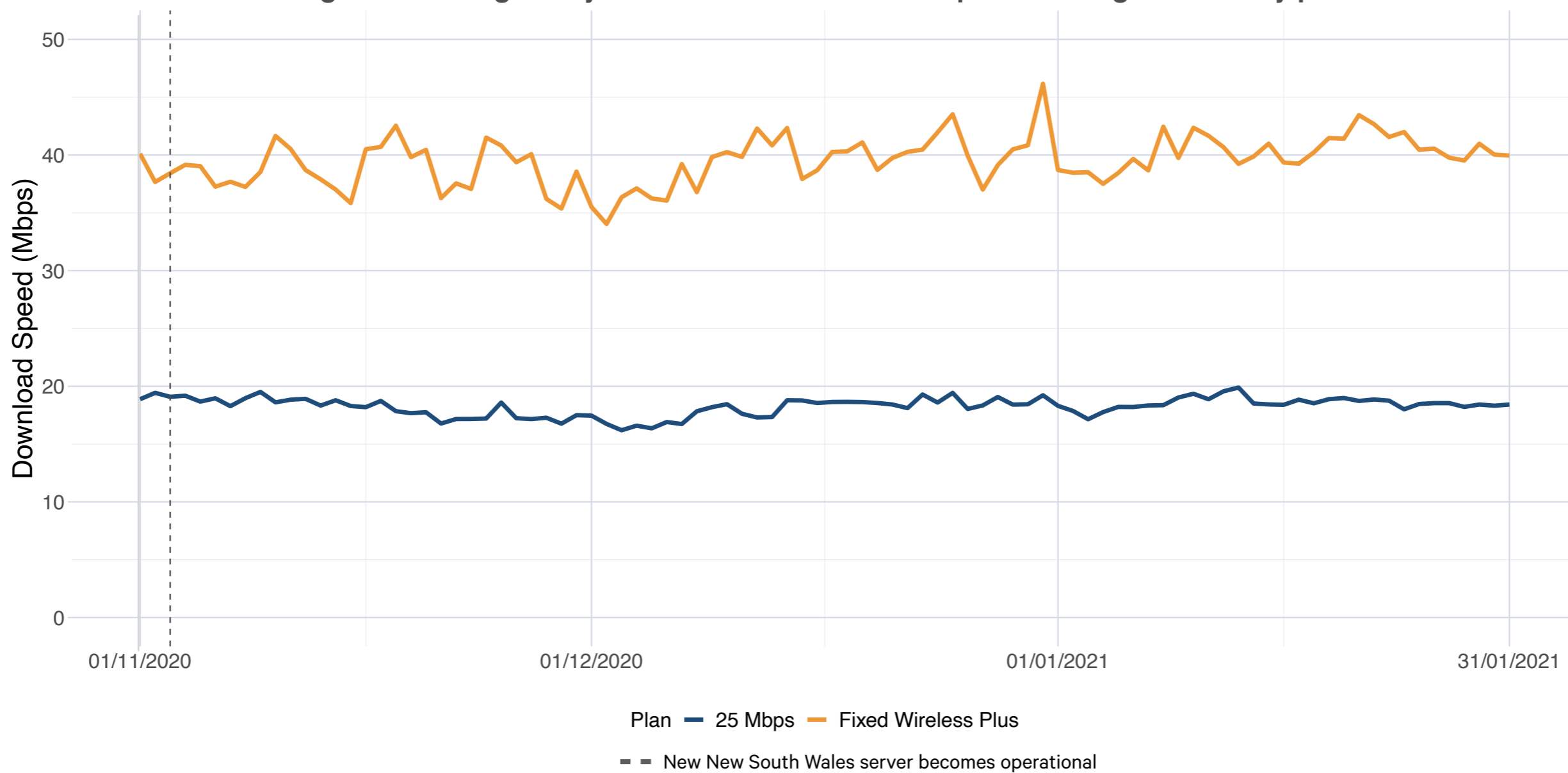
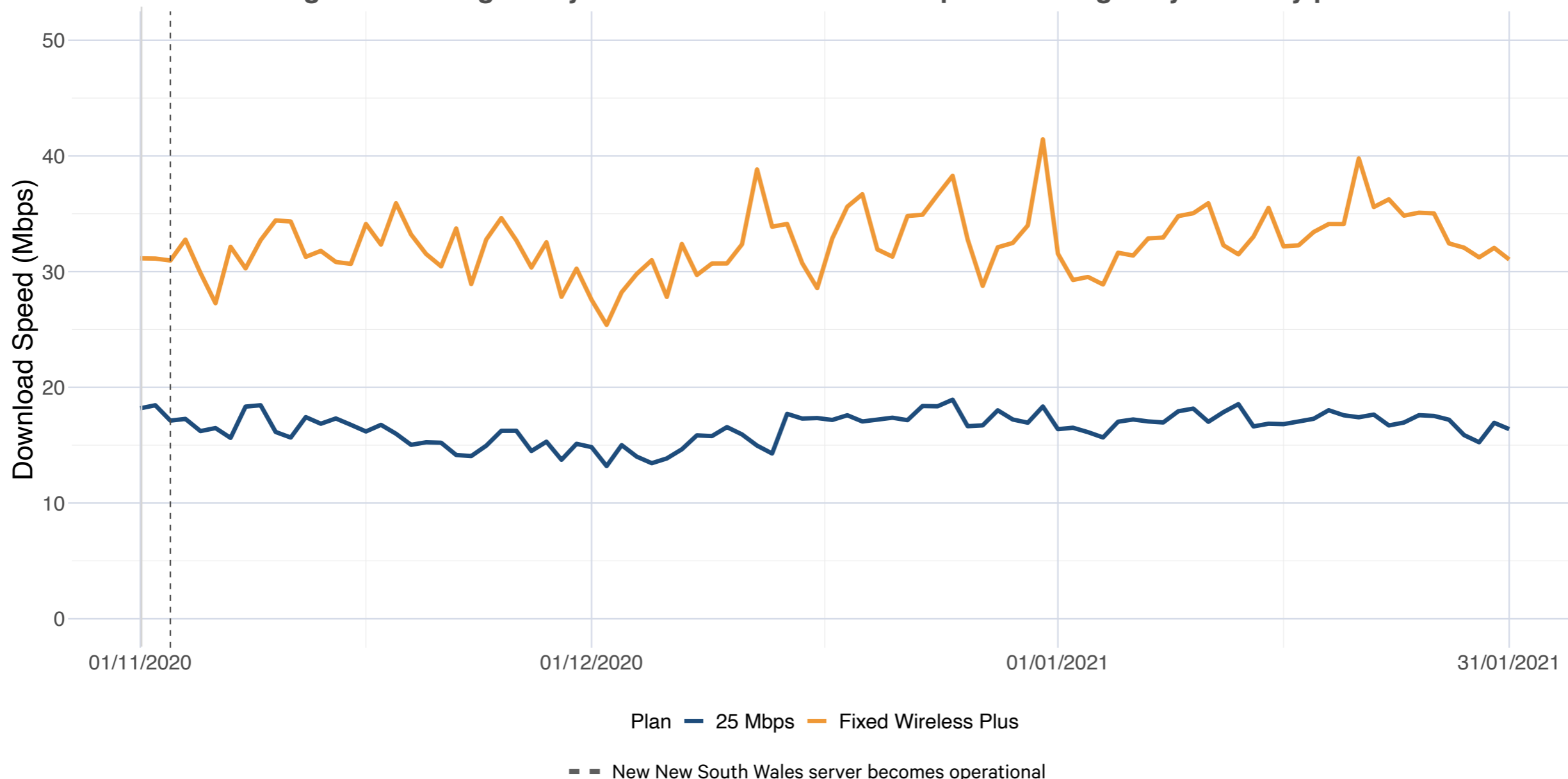


Figure 6: Average Daily Fixed Wireless download speeds during busy hours by plan

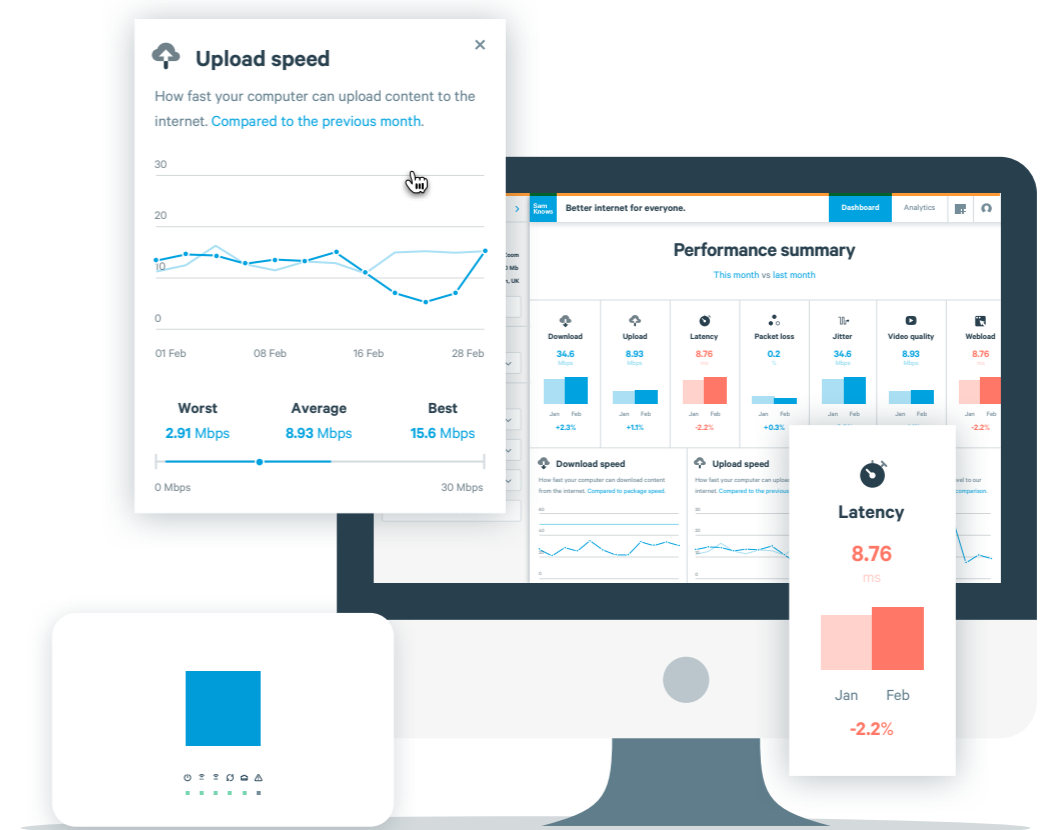




# How we test

## SamKnows One analytics

- View all your data in one place.
- Create customised charts and save the results that mean the most to you.
- Track changes in your connection over time.













## Measuring homes across Australia

- The SamKnows Whitebox is a purpose-built testing agent that connects to your router.
- Measures every aspect of your internet service delivered to your home.
- Runs at regular intervals when you're not using the internet.

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## Tests

Metric	Definition
 <b>Download</b>	The speed data travels from our test server to your device, measured in bits per second.
 <b>Upload</b>	The speed data travels from your device to our test server, measured in bits per second.
 <b>Latency</b>	How long it takes a data packet to go from your device to our test server and back to your device.
 <b>Jitter</b>	Measures the amount of difference between packet delays, or the stability of your latency.
 <b>Packet Loss</b>	When a packet of data becomes lost (does not arrive for two seconds) measured as a percentage of packets lost out of packets sent.
 <b>YouTube</b>	Measures the highest bitrate you can reliably stream for the most popular video in your country.
 <b>Netflix</b>	An application-specific test, supporting the streaming of binary data from Netflix's servers using the same CDN selection logic as their real client uses. The test has been developed in direct cooperation with Netflix.
 <b>Web browsing</b>	Measures how long it takes to fetch the HTML and referenced resources of a popular website.
 <b>CDN measurements</b>	Measures download performance for the same (or very similar) object from a variety of popular Content Delivery Networks over HTTP.
 <b>Voice over IP</b>	Measures the suitability of a broadband connection for VoIP calls.