Measuring Broadband Australia Program

ACCC — AUSTRALIAN COMPETITION & CONSUMER COMMISSION

Twenty-second Report Appendix, September 2023

NBN fixed-line services tables

NBN video streaming tables

The following tables show information on the proportion of NBN services on the main NBN fixed-line plans which would be able to reliably stream (with a low chance of stopping and starting) a varying number of videos from Netflix simultaneously during busy hours. Data from underperforming and impaired services is included.

A High Definition stream from Netflix takes up around 2.2 Mbps data rate on average. For consumers with premium Ultra High Definition (4K) video stream, an Ultra High Definition stream from Netflix takes up 12 Mbps data rate on average. The actual data rate will vary during video streaming: for example Netflix would use a higher data rate during a fast-paced action scene. The actual data rate will also depend on how many other users are using Netflix.

The Whitebox measures the total downstream data rate available from Netflix's servers. Therefore, by using multiples of 2.2 Mbps (for High Definition) and 12 Mbps (for Ultra High Definition) it allows us to infer whether a NBN fixed-line service would be able to support different numbers of simultaneous streams. This assumes no other use of the connection at the time, i.e. that Netflix is the only application running.

By plan download speed

Download plan	1 HD (2.2 Mbps)	2 HD (4.4 Mbps)	3 HD (6.6 Mbps)	4 HD (8.8 Mbps)	5 HD (11 Mbps)	Panel size
NBN25	100%	100%	100%	99%	99%	96
NBN50	100%	100%	100%	100%	100%	563
NBN100	100%	100%	100%	100%	100%	412

Download plan	1 UHD (12 Mbps)	2 UHD (24 Mbps)	3 UHD (36 Mbps)	4 UHD (48 Mbps)	5 UHD (60 Mbps)	Panel size
NBN25	98%	83%	0%	0%	0%	96
NBN50	100%	98%	88%	68%	0%	563
NBN100	100%	100%	100%	98%	96%	412

By RSP[1]

RSP	Download plan	1 UHD	2 UHD	3 UHD	4 UHD	Panel size
Aussie Broadband	50	100%	100%	84%	62%	63
Dodo & iPrimus	50	100%	98%	86%	62%	56
Exetel	50	100%	96%	88%	73%	52
iiNet	50	100%	98%	89%	68%	63
Optus	50	100%	100%	97%	81%	67
Telstra	50	100%	99%	91%	76%	78
TPG	50	100%	100%	93%	76%	70
RSP	Download plan	1 UHD	2 UHD	3 UHD	4 UHD	Panel size
Aussie Broadband	100	100%	100%	100%	97%	69
Exetel	100	100%	100%	95%	93%	41
Optus	100	100%	100%	100%	95%	43
Telstra	100	100%	100%	100%	100%	62
Superloop	100	100%	100%	100%	98%	58

[1] These tables only show data for RSPs having at least 40 units on the respective download speed tier reporting measurements.

NBN RSP tables

The following tables show statistical information on download speeds, upload speeds, and outages for each RSP across all NBN plans, and for individual NBN plans in instances where at least 40 Whiteboxes reported successfully during the test period.

- The overall speed is the average speed (download or upload) for the RSP, measured as a percentage of plan speed.

- Standard deviation is a measure of how widely or narrowly test speeds are distributed in the data set.

- The 95% confidence interval is a range in which the 'true' average value is estimated to lie and is a function of the sample size (i.e. number of Whiteboxes online) and standard deviation.

If the standard deviation is larger then the confidence interval will be wider, reflecting greater variability in the underlying data. If the sample size is larger then the confidence interval will be narrower, reflecting more certainty in the underlying data.

For example: during testing, we measured an average download performance of 99.7% of plan speed for Dodo & iPrimus across all NBN plans with a 95% confidence interval of ±2.3%. If we were to repeat our sampling 100 times, we expect that this average would fall between 97.4% and 102.0% in at least 95 cases.

Period	RSP	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Aussie Broadband	99.1%	13.4%	97.1% - 101.1%	173	61,952
All hours	Dodo & iPrimus	99.7%	12.7%	97.4% - 102.0%	114	39,353
All hours	Exetel	103.2%	9.9%	101.5% - 105.0%	120	34,863
All hours	iiNet	98.2%	13.1%	95.8% - 100.6%	113	41,040
All hours	Launtel	106.7%	6.5%	105.0% - 108.5%	53	17,249
All hours	Optus	101.5%	13.5%	99.0% - 103.9%	118	42,204
All hours	Telstra	102.1%	12.2%	100.2% - 104.0%	165	62,545
All hours	TPG	99.8%	12.2%	97.7% - 101.9%	130	44,637
All hours	Superloop	98.5%	10.9%	96.3% - 100.7%	93	33,272
All hours	Vodafone	98.3%	13.6%	94.7% - 101.8%	58	18,502

Period	RSP	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Aussie Broadband	97.5%	13.3%	95.5% - 99.5%	173	11,141
Busy hours	Dodo & iPrimus	98.2%	13.0%	95.8% - 100.6%	114	7,158
Busy hours	Exetel	101.9%	10.0%	100.2% - 103.7%	120	6,206
Busy hours	iiNet	97.2%	13.2%	94.8% - 99.7%	113	7,324
Busy hours	Launtel	105.5%	6.9%	103.6% - 107.3%	53	3,062
Busy hours	Optus	100.2%	13.7%	97.7% - 102.6%	118	7,289
Busy hours	Telstra	100.4%	12.1%	98.5% - 102.2%	165	11,485
Busy hours	TPG	98.6%	12.2%	96.5% - 100.7%	130	7,989
Busy hours	Superloop	97.5%	10.9%	95.3% - 99.7%	93	6,004
Busy hours	Vodafone	96.1%	13.6%	92.6% - 99.6%	58	3,246

Period	RSP	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Aussie Broadband	85.2%	16.6%	82.8% - 87.7%	173	50,726
All hours	Dodo & iPrimus	86.8%	17.4%	83.6% - 90.0%	114	31,969
All hours	Exetel	88.0%	13.9%	85.5% - 90.5%	120	28,358
All hours	iiNet	83.7%	20.1%	80.0% - 87.4%	113	33,494
All hours	Launtel	89.6%	6.6%	87.8% - 91.4%	53	14,105
All hours	Optus	87.7%	13.2%	85.3% - 90.1%	118	34,573
All hours	Telstra	87.3%	14.9%	85.1% - 89.6%	165	50,866
All hours	TPG	84.4%	17.3%	81.4% - 87.4%	130	36,573
All hours	Superloop	88.1%	14.5%	85.2% - 91.1%	93	27,120
All hours	Vodafone	88.8%	15.8%	84.7% - 92.8%	58	15,235

Period	RSP	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Aussie Broadband	84.8%	16.7%	82.3% - 87.3%	171	5,665
Busy hours	Dodo & iPrimus	86.4%	17.6%	83.2% - 89.6%	114	3,633
Busy hours	Exetel	87.8%	13.9%	85.3% - 90.2%	120	3,128
Busy hours	iiNet	83.6%	20.0%	79.9% - 87.3%	113	3,789
Busy hours	Launtel	89.5%	6.7%	87.7% - 91.3%	53	1,540
Busy hours	Optus	87.5%	13.1%	85.2% - 89.9%	118	3,692
Busy hours	Telstra	87.1%	14.9%	84.9% - 89.4%	165	5,815
Busy hours	TPG	84.1%	17.3%	81.2% - 87.1%	129	4,059
Busy hours	Superloop	87.8%	14.4%	84.9% - 90.7%	93	2,991
Busy hours	Vodafone	88.5%	15.7%	84.5% - 92.5%	58	1,636

Period	RSP	Download plan	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Aussie Broadband	50	96.5%	15.5%	92.6% - 100.3%	63	22,796
All hours	Aussie Broadband	100	99.7%	11.9%	96.9% - 102.5%	69	24,946
All hours	Dodo & iPrimus	50	97.0%	16.0%	92.8% - 101.1%	56	18,392
All hours	Exetel	50	102.0%	12.0%	98.7% - 105.2%	53	17,501
All hours	Exetel	100	103.5%	7.9%	101.1% - 105.9%	42	11,589
All hours	iiNet	50	96.7%	15.7%	92.8% - 100.5%	63	23,346
All hours	Optus	50	103.4%	10.0%	101.0% - 105.8%	67	23,852
All hours	Optus	100	98.8%	15.4%	94.3% - 103.4%	44	15,506
All hours	Telstra	50	100.5%	14.6%	97.3% - 103.7%	79	31,065
All hours	Telstra	100	102.5%	10.1%	100.0% - 105.0%	62	21,986
All hours	TPG	50	99.9%	11.9%	97.2% - 102.7%	71	24,378
All hours	Superloop	100	98.7%	11.0%	95.9% - 101.5%	58	20,044

Period	RSP	Download plan	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Aussie Broadband	50	95.2%	15.2%	91.4% - 98.9%	63	3,987
Busy hours	Aussie Broadband	100	98.1%	12.2%	95.3% - 101.0%	69	4,596
Busy hours	Dodo & iPrimus	50	95.7%	16.2%	91.4% - 99.9%	56	3,406
Busy hours	Exetel	50	100.6%	12.3%	97.3% - 103.9%	53	3,103
Busy hours	Exetel	100	102.2%	8.2%	99.7% - 104.7%	42	2,041
Busy hours	iiNet	50	95.7%	15.8%	91.8% - 99.6%	63	4,165
Busy hours	Optus	50	102.0%	10.3%	99.5% - 104.5%	67	4,157
Busy hours	Optus	100	97.6%	15.7%	93.0% - 102.3%	44	2,578
Busy hours	Telstra	50	98.8%	14.6%	95.6% - 102.0%	79	5,674
Busy hours	Telstra	100	100.8%	10.0%	98.3% - 103.3%	62	4,000
Busy hours	TPG	50	98.7%	11.9%	95.9% - 101.5%	71	4,290
Busy hours	Superloop	100	97.7%	10.9%	94.9% - 100.5%	58	3,559

Period	RSP	Upload plan	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Aussie Broadband	20	84.2%	18.5%	80.7% - 87.7%	109	32,096
All hours	Dodo & iPrimus	20	84.7%	20.4%	80.1% - 89.3%	77	20,896
All hours	Exetel	20	85.8%	17.1%	81.9% - 89.8%	72	17,425
All hours	iiNet	20	80.6%	22.1%	75.6% - 85.6%	75	22,370
All hours	Optus	20	87.3%	14.4%	84.1% - 90.4%	81	23,697
All hours	Telstra	20	86.5%	15.8%	83.9% - 89.2%	135	41,688
All hours	TPG	20	82.9%	18.3%	79.2% - 86.7%	90	24,644
All hours	Superloop	20	87.6%	16.7%	83.2% - 91.9%	56	16,698
All hours	Vodafone	20	89.6%	13.6%	85.9% - 93.4%	51	12,988

Period	RSP	Upload plan	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Aussie Broadband	20	83.9%	18.7%	80.4% - 87.4%	108	3,497
Busy hours	Dodo & iPrimus	20	84.5%	20.4%	80.0% - 89.1%	77	2,371
Busy hours	Exetel	20	85.6%	17.1%	81.7% - 89.6%	72	1,903
Busy hours	iiNet	20	80.5%	22.1%	75.5% - 85.5%	75	2,527
Busy hours	Optus	20	87.1%	14.4%	84.0% - 90.2%	81	2,532
Busy hours	Telstra	20	86.3%	15.8%	83.6% - 89.0%	135	4,729
Busy hours	TPG	20	82.8%	18.4%	79.0% - 86.6%	89	2,684
Busy hours	Superloop	20	87.3%	16.6%	83.0% - 91.7%	56	1,867
Busy hours	Vodafone	20	89.4%	13.5%	85.7% - 93.1%	51	1,366

RSP	Percentage of units having no outages	Percentage of units having outages at most every other day	Percentage of units having outages on most days	Percentage of units having outages at least once a day
Aussie Broadband	35.8%	53.8%	4.0%	6.4%
Dodo & iPrimus	15.8%	64.0%	10.5%	9.6%
Exetel	27.5%	68.3%	2.5%	1.7%
Launtel	17.3%	65.4%	1.9%	15.4%
Optus	39.0%	60.2%	0.8%	0.0%
Superloop	41.9%	51.6%	6.5%	0.0%
TPG	17.7%	72.3%	3.1%	6.9%
Telstra	20.6%	69.1%	4.8%	5.5%
Vodafone	20.7%	67.2%	10.3%	1.7%
iiNet	34.5%	61.1%	0.9%	3.5%

RSP	Percentage of outages lasting 30-60 sec	Percentage of outages lasting 1-3 min	Percentage of outages lasting 3-10 min	Percentage of outages lasting 10 min or more
Aussie Broadband	28.5%	27.8%	35.7%	8.0%
Dodo & iPrimus	29.3%	30.4%	17.0%	23.4%
Exetel	25.1%	28.7%	34.7%	11.5%
Launtel	20.8%	22.3%	43.9%	13.1%
Optus	27.2%	31.8%	21.3%	19.7%
Superloop	24.5%	28.0%	23.3%	24.1%
TPG	27.6%	31.9%	32.4%	8.0%
Telstra	19.0%	19.5%	24.0%	37.5%
Vodafone	15.5%	39.8%	25.2%	19.6%
iiNet	23.2%	30.1%	24.7%	22.0%

NBN plan tables

The following tables show statistical information on download and upload speeds for each NBN plan, including all tested RSPs.

Period	Download plan	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	25	104.2%	7.9%	102.6% - 105.7%	99	37,390
All hours	50	99.4%	13.5%	98.3% - 100.5%	567	202,714
All hours	100	99.6%	11.4%	98.5% - 100.7%	418	140,877
All hours	250	99.9%	16.5%	96.6% - 103.3%	91	28,827

Period	Download plan	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	25	103.0%	8.2%	101.4% - 104.6%	99	6,899
Busy hours	50	97.9%	13.7%	96.8% - 99.0%	567	36,327
Busy hours	100	98.1%	11.7%	97.0% - 99.3%	418	24,915
Busy hours	250	97.0%	19.2%	93.1% - 101.0%	91	5,289

Period	Upload plan	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	5	88.7%	14.1%	85.2% - 92.2%	62	18,987
All hours	20	85.1%	17.8%	83.9% - 86.3%	829	236,755
All hours	25	90.0%	9.8%	87.9% - 92.0%	87	22,692
All hours	40	90.1%	8.4%	88.8% - 91.4%	163	45,660

Period	Upload plan	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	5	88.5%	13.9%	85.0% - 92.0%	62	2,213
Busy hours	20	84.9%	17.8%	83.7% - 86.1%	827	26,165
Busy hours	25	89.5%	9.8%	87.5% - 91.6%	87	2,604
Busy hours	40	89.5%	8.8%	88.2% - 90.9%	162	4,992

NBN technology tables

The following tables show statistical information on download speeds, upload speeds, and outages on a per-technology basis.

Period	Technology	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Fibre to the premises - FTTP	103.7%	9.4%	102.7% - 104.7%	368	122,043
All hours	Fibre to the curb - FTTC	101.6%	7.3%	100.1% - 103.2%	87	29,804
All hours	Hybrid fibre-coaxial - HFC	103.9%	7.5%	103.0% - 104.7%	287	99,155
All hours	Fibre to the node - FTTN	94.8%	15.7%	93.4% - 96.2%	481	174,503
Period	Technology	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Fibre to the premises - FTTP	101.9%	11.1%	100.8% - 103.1%	368	21,924
Busy hours	Fibre to the curb - FTTC	100.3%	7.5%	98.7% - 101.8%	87	5,302
Busy hours	Hybrid fibre-coaxial - HFC	102.2%	8.0%	101.3% - 103.2%	287	17,981
Busy hours	Fibre to the node - FTTN	93.4%	15.8%	92.0% - 94.8%	481	31,062
Period	Technology	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Fibre to the premises - FTTP	91.1%	7.7%	90.3% - 91.8%	368	99,816
All hours	Fibre to the curb - FTTC	90.8%	8.5%	89.0% - 92.6%	87	24,073
All hours	Hybrid fibre-coaxial - HFC	91.3%	7.6%	90.5% - 92.2%	287	81,150
All hours	Fibre to the node - FTTN	79.3%	21.7%	77.4% - 81.2%	481	142,421

Period	Technology	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Fibre to the premises - FTTP	90.7%	7.8%	89.9% - 91.5%	365	11,135
Busy hours	Fibre to the curb - FTTC	90.5%	8.5%	88.8% - 92.3%	87	2,664
Busy hours	Hybrid fibre-coaxial - HFC	91.0%	7.6%	90.1% - 91.9%	287	9,107
Busy hours	Fibre to the node - FTTN	79.1%	21.6%	77.1% - 81.0%	481	15,713

Technology	Percentage of units having no outages	Percentage of units having outages at most every other day	Percentage of units having outages on most days	Percentage of units having outages at least once a day
Fibre to the curb - FTTC	33.3%	55.2%	3.4%	8.0%
Fibre to the node - FTTN	26.2%	62.6%	5.0%	6.2%
Fibre to the premises - FTTP	36.0%	56.1%	3.5%	4.4%
Hybrid fibre-coaxial - HFC	14.3%	71.4%	6.3%	8.0%

Technology	Percentage of outages lasting 30-60 sec	Percentage of outages lasting 1-3 min	Percentage of outages lasting 3-10 min	Percentage of outages lasting 10 min or more
Fibre to the curb - FTTC	39.6%	27.2%	29.6%	3.6%
Fibre to the node - FTTN	30.8%	25.0%	23.2%	21.0%
Fibre to the premises - FTTP	27.6%	33.6%	27.6%	11.3%
Hybrid fibre-coaxial - HFC	23.7%	29.5%	27.1%	19.8%

NBN state tables

This table shows statistical information on download speeds on a per-state basis. In this report, we have been able to draw upon all of the test results from a range of locations.

Period	State or Territory	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	NSW	100.7%	12.4%	99.5% - 101.9%	398	138,740
All hours	ACT	94.6%	16.2%	90.3% - 98.9%	55	18,929
All hours	VIC	101.1%	11.6%	99.8% - 102.3%	330	115,696
All hours	QLD	99.6%	11.8%	98.0% - 101.2%	208	70,069
All hours	WA	97.9%	15.5%	95.0% - 100.9%	108	39,472
All hours	TAS	100.6%	12.0%	97.4% - 103.8%	53	18,326
All hours	NT + SA	100.5%	12.2%	97.6% - 103.3%	71	24,273
Period	State or Territory	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	NSW	99.1%	13.3%	97.8% - 100.4%	398	25,223
Busy hours	ACT	92.5%	17.1%	88.0% - 97.0%	55	3,310
Busy hours	VIC	99.4%	12.0%	98.1% - 100.7%	330	20,868
Busy hours	QLD	98.2%	12.0%	96.6% - 99.9%	208	12,620
Busy hours	WA	96.7%	15.5%	93.8% - 99.7%	108	6,717
Busy hours	TAS	99.0%	11.9%	95.8% - 102.2%	53	3,175
Busy hours	NT + SA	99.4%	12.2%	96.6% - 102.2%	71	4,356

NBN50 and NBN100 advertised speed tables

The figures in the following table are based on the typical evening hour speeds that were the predominant speed advertised by RSPs during the measurement period. The single weighted average speed claim is calculated based on the number of Whiteboxes online for each RSP for each plan (excluding underperforming and impaired services).

RSP	NBN50 advertised % of plan speed	NBN100 advertised % of plan speed	Number of NBN50 Whiteboxes (excluding underperforming and impaired services)	Number of NBN100 Whiteboxes (excluding underperforming and impaired services)	Weighted advertised % of plan speed
Aussie Broadband	100.0%	100.0%	52	62	100.0%
Dodo & iPrimus	100.0%	100.0%	49	28	100.0%
Exetel	100.0%	100.0%	46	42	100.0%
Optus	100.0%	100.0%	60	37	100.0%
Superloop	96.0%	95.0%	26	54	95.3%
TPG	100.0%	90.0%	60	21	97.4%
Telstra	100.0%	100.0%	67	58	100.0%
Vodafone	100.0%	90.0%	27	21	95.6%
iiNet	100.0%	90.0%	49	27	96.4%

There were 124 busy hours (Monday–Sunday) across the 31 day period from 1 to 31 May 2023. The following table shows the proportion of busy hours in which each RSP's average speed for each plan met the advertised claims above.

RSP	% of busy hours in which advertised download speed met or exceeded	% of busy hours in which advertised download speed met or exceeded (excluding underperforming and impaired services)
Aussie Broadband	2%	71%
Dodo & iPrimus	24%	79%
Exetel	67%	94%
Optus	52%	94%
Superloop	93%	98%
TPG	52%	99%
Telstra	65%	95%
Vodafone	62%	84%
iiNet	51%	98%

NBN Whiteboxes connected to underperforming services

The following table shows the number of Whiteboxes on NBN services for each RSP, alongside the number of Whiteboxes connected to underperforming services.

RSP	NBN Whiteboxes	NBN Whiteboxes on underperforming services	% NBN Whiteboxes on underperforming services
Aussie Broadband	173	12	7%
Dodo & iPrimus	114	6	5%
Exetel	120	3	3%
Launtel	53	0	0%
Optus	118	5	4%
Other RSPs	86	4	5%
Superloop	93	4	4%
TPG	130	6	5%
Telstra	165	7	4%
Vodafone	58	3	5%
iiNet	113	7	6%
Total	1,223	57	5%

As highlighted in the main report, the majority of underperforming services are connected to fibre to the node infrastructure. The following table shows the number of Whiteboxes on fibre to the node services for each plan, alongside the number of underperforming services.

Technology	Plan	NBN Whiteboxes	NBN Whiteboxes on underperforming services	% NBN Whiteboxes on underperforming services
Fibre to the node - FTTN	12	7	0	0%
Fibre to the node - FTTN	25	65	0	0%
Fibre to the node - FTTN	50	297	36	12%
Fibre to the node - FTTN	100	106	13	12%
Fibre to the node - FTTN	Other NBN plans	6	1	17%
Fibre to the node - FTTN	All NBN Plans	481	50	10%

NBN very high speed services tables

The figures in the following table are based on very high speed services, where the underlying wholesale product sold by NBN Co has a download/upload speed range of 500-990/50 Mbps.

Period	Plan	Download average Mbps (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Very High Speed	798.1 Mbps	187.3 Mbps	768.4 Mbps - 827.8 Mbps	153	47,033

Period	Plan	Download average Mbps (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Very High Speed	717.5 Mbps	187.8 Mbps	687.6 Mbps - 747.5 Mbps	151	8,301

Period	Plan	Upload average Mbps (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Very High Speed	45.8 Mbps	2.6 Mbps	45.4 Mbps - 46.2 Mbps	153	38,678

Period	Plan	Upload average Mbps (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Very High Speed	45.4 Mbps	2.9 Mbps	45 Mbps - 45.9 Mbps	151	4,226

Plan	Percentage of units having no outages	Percentage of units having outages at most every other day	Percentage of units having outages on most days	Percentage of units having outages at least once a day
Very High Speed	30.1%	56.2%	5.2%	8.5%

Plan	Percentage of outages lasting 30-60 sec	Percentage of outages lasting 1-3 min	Percentage of outages lasting 3-10 min	Percentage of outages lasting 10 min or more
Very High Speed	31.0%	20.6%	25.5%	22.9%

NBN fixed wireless services tables

The figures in the following table are based on both the 25/5Mbps fixed wireless plan and the Fixed Wireless Plus plan.

Period	Technology	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Fixed Wireless	109.7%	28.1%	104.0% - 115.5%	93	34,101

Period	Technology	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Fixed Wireless	87.5%	32.0%	81.0% - 94.0%	93	6,113

Period	Technology	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Fixed Wireless	77.1%	36.0%	69.7% - 84.4%	93	27,771

Period	Technology	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Fixed Wireless	63.4%	35.3%	56.2% - 70.7%	92	3,044

Technology	Percentage of units having no outages	Percentage of units having outages at most every other day	Percentage of units having outages on most days	Percentage of units having outages at least once a day
Fixed Wireless	18.3%	66.7%	8.6%	6.5%

Technology	Percentage of outages lasting 30-60 sec	Percentage of outages lasting 1-3 min	Percentage of outages lasting 3-10 min	Percentage of outages lasting 10 min or more
Fixed Wireless	35.8%	24.6%	21.4%	18.2%

Other superfast access networks

The figures in the following table show results for services on other superfast access networks (all plans).

Period	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	105%	12%	102% - 109%	46	16,402
Period	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	105%	9%	102% - 107%	46	2,966
Period	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	89%	4%	88% - 90%	46	13,335
Period	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	89%	4%	88% - 90%	46	1,502

Technology	Percentage of units having no outages	Percentage of units having outages at most every other day	Percentage of units having outages on most days	Percentage of units having outages at least once a day
Other superfast access networks	24.4%	60.0%	6.7%	8.9%
Technology	Percentage of outages lasting 30-60 sec	Percentage of outages lasting 1-3 min	Percentage of outages lasting 3-10 min	Percentage of outages lasting 10 min or more
Other superfast access networks	43.7%	29.2%	18.5%	8.6%

Test Definitions & Glossary

Test definitions

	Test	Definition
	Download	The speed at which data can be transferred from the SamKnows test server to your computer, measured in megabits per second (Mbps).
	Upload	The speed at which information is transferred from your computer to the SamKnows test server, measured in megabits per second (Mbps).
	Latency	How long it takes a data packet to go from your device to our test server and back to your device, measured in milliseconds (ms). The shorter the latency, the better.
	Jitter	The variation in the delay of received packets, measured in milliseconds (ms). Essentially it is a measure of the stability of latency.
	Packet loss	Packet loss counts packets that are sent over a network and don't make it to their destination, measured as a percentage of packets lost out of all packets sent.
	Webpage loading time	The time it takes for a specific webpage to fully load. This is a combination test that includes download, latency and DNS in one test that accurately mimics real-world usage.
	Outages	The outages metric tracks how many times per day your broadband connection goes offline for at least 30 seconds. Outages between 12am and 5am are excluded from this metric as this is when network maintenance typically occurs.
	Video streaming	Measures the highest bitrate (in Mbps), and therefore quality level, you can reliably stream from real content servers.

Glossary

Term	Definition
Advertised speed	The speed claim made by an RSP for a given plan during a Measuring Broadband Australia reporting period. May be the same as or lower than plan speed.
All hours	Refers to tests conducted at any time of the day.
Busiest hour	Fifth lowest hourly average speed out of all busy hours in the month (including weekends cf. 'busy hours').
Busy hours	Refers to tests conducted between 19:00:00 and 22:59:59, Monday to Friday. For calculating the busiest hour and for determining the % of busy hours where the speed claim was attained, "busy hours" include 19:00:00 and 22:59:59, Monday to Sunday
Customer-premises equipment (CPE)	Network equipment provided by an RSP (generally including a home router/gateway).
Download performance	Measured download speed expressed as a percentage of plan speed. e.g. for an NBN50 service, 100% download performance would be 50 Mbps. Prior to overprovisioning this was capped at 100%. Since NBN has begun overprovisioning services, results above 100% are common.
FTTN / Fibre to the node	Measuring Broadband Australia treats the FTTN / Fibre to the Node and FTTB / Fibre to the Building access technologies as identical for reporting.
Fixed-Line	For reporting, fixed-line encompasses the FTTP (Fibre to the Premises), FTTB (Fibre to the Building), HFC (Hybrid Fibre-Coaxial), FTTC (Fibre to the Curb), and FTTN (Fibre to the Node) access technologies.
Impaired service	FTTN / Fibre to the Node services where the maximum attainable line speed measured by NBN Co is below plan speed.
NBN service	A proxy for a single household which accesses the internet through the NBN.
Plan and plan speed	Plan refers to the retail broadband product. Each plan has an associated download and upload speed. For example, a 100/20 Mbps plan includes a 100 Mbps download plan speed and a 20 Mbps upload plan speed. The term "NBN100" refers to a download plan speed of 100 Mbps, but the upload plan speed may vary.
SamKnows	The independent testing provider appointed to conduct testing for Measuring Broadband Australia. https://samknows.com/
Testing infrastructure	SamKnows-maintained test servers hosted within Australia.
Underperforming service	Services which reach above 75% of plan speed in no more than 5% of download tests. These are services which rarely or never attain plan speed.
Very high speed service	Services where the underlying wholesale product sold by NBN Co has a download/upload speed range of 500-990/50 Mbps (referred to by NBN Co as 'Home Ultrafast').
Whitebox	A purpose-built hardware measurement agent manufactured by SamKnows, installed in volunteers' homes.