



# Measuring Broadband Australia



## Report 19 Appendix, December 2022

# 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.

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%	100%	100%	85
NBN50	100%	100%	100%	100%	100%	579
NBN100	100%	100%	100%	100%	100%	385
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	100%	76%	0%	0%	0%	85
NBN50	100%	96%	85%	64%	0%	579
NBN100	100%	99%	92%	89%	86%	385

RSP	Download plan	1 UHD	2 UHD	3 UHD	4 UHD	Panel size
Aussie Broadband	50	100%	99%	75%	44%	73
Dodo & iPrimus	50	100%	100%	88%	62%	40
Exetel	50	100%	98%	82%	69%	45
iiNet	50	100%	97%	89%	67%	70
Optus	50	100%	100%	98%	80%	65
Telstra	50	100%	98%	91%	77%	99
TPG	50	100%	99%	95%	74%	74
RSP	Download plan	1 UHD	2 UHD	3 UHD	4 UHD	Panel size
Aussie Broadband	100	100%	97%	94%	90%	68
Optus	100	100%	100%	100%	100%	48
Telstra	100	100%	100%	100%	100%	48

# 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 98.1% of plan speed for Dodo & iPrimus across all NBN plans with a 95% confidence interval of  $\pm 3.0\%$ . If we were to repeat our sampling 100 times, we expect that this average would fall between 95.1% and 101.1% 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	97.5%	13.9%	95.5% - 99.4%	191	67,398
All hours	Dodo & iPrimus	98.1%	13.4%	95.1% - 101.1%	77	28,111
All hours	Exetel	102.9%	12.5%	100.1% - 105.6%	78	26,061
All hours	iiNet	97.4%	14.2%	95.0% - 99.8%	132	50,419
All hours	Launtel	104.5%	9.5%	102.0% - 107.0%	57	18,654
All hours	MyRepublic	100.2%	13.4%	96.4% - 104.0%	47	16,827
All hours	Optus	103.0%	10.8%	101.0% - 104.9%	119	42,983
All hours	Telstra	101.2%	14.3%	99.1% - 103.3%	174	65,540
All hours	TPG	99.6%	13.0%	97.5% - 101.7%	148	52,027
All hours	Superloop	99.2%	8.9%	97.0% - 101.3%	67	21,987
All hours	Vodafone	97.4%	15.0%	93.7% - 101.2%	62	21,213

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	96.0%	14.1%	94.0% - 98.0%	191	12,159
Busy hours	Dodo & iPrimus	96.9%	13.6%	93.8% - 99.9%	77	5,203
Busy hours	Exetel	101.5%	12.3%	98.7% - 104.2%	78	4,732
Busy hours	iiNet	96.4%	14.3%	94.0% - 98.9%	132	9,217
Busy hours	Launtel	103.3%	9.7%	100.8% - 105.8%	57	3,444
Busy hours	MyRepublic	97.5%	13.3%	93.7% - 101.3%	47	2,995
Busy hours	Optus	101.7%	11.2%	99.7% - 103.7%	119	7,472
Busy hours	Telstra	99.8%	14.3%	97.6% - 101.9%	173	11,950
Busy hours	TPG	98.3%	13.2%	96.2% - 100.4%	148	9,362
Busy hours	Superloop	97.9%	9.3%	95.7% - 100.1%	67	4,002
Busy hours	Vodafone	96.1%	15.1%	92.4% - 99.9%	62	3,844

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	84.3%	17.0%	81.9% - 86.7%	191	54,906
All hours	Dodo & iPrimus	86.8%	12.9%	83.9% - 89.7%	77	22,885
All hours	Exetel	89.0%	12.8%	86.1% - 91.8%	78	20,709
All hours	iiNet	83.3%	20.6%	79.8% - 86.8%	132	40,898
All hours	Launtel	88.7%	9.2%	86.3% - 91.1%	57	15,149
All hours	MyRepublic	88.9%	15.7%	84.4% - 93.4%	47	13,757
All hours	Optus	87.1%	13.8%	84.6% - 89.5%	119	35,252
All hours	Telstra	86.8%	16.3%	84.4% - 89.2%	174	53,210
All hours	TPG	83.7%	20.0%	80.5% - 86.9%	148	42,581
All hours	Superloop	88.2%	13.8%	84.9% - 91.5%	67	17,925
All hours	Vodafone	86.1%	17.3%	81.8% - 90.4%	62	17,306

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	84.0%	17.0%	81.6% - 86.4%	191	6,200
Busy hours	Dodo & iPrimus	86.7%	12.7%	83.8% - 89.5%	77	2,655
Busy hours	Exetel	88.7%	12.9%	85.8% - 91.5%	77	2,292
Busy hours	iiNet	83.1%	20.5%	79.6% - 86.6%	132	4,689
Busy hours	Launtel	88.5%	9.2%	86.1% - 90.9%	57	1,749
Busy hours	MyRepublic	88.1%	15.6%	83.7% - 92.6%	47	1,508
Busy hours	Optus	86.9%	13.7%	84.4% - 89.3%	119	3,780
Busy hours	Telstra	86.5%	16.3%	84.1% - 89.0%	173	6,038
Busy hours	TPG	83.5%	20.0%	80.2% - 86.7%	147	4,768
Busy hours	Superloop	87.0%	15.0%	83.4% - 90.6%	67	1,999
Busy hours	Vodafone	85.9%	17.1%	81.7% - 90.2%	62	1,957

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	96.0%	16.2%	92.2% - 99.7%	73	27,070
All hours	Aussie Broadband	100	96.1%	14.0%	92.8% - 99.4%	68	23,530
All hours	Dodo & iPrimus	50	95.8%	14.4%	91.4% - 100.3%	40	15,359
All hours	Exetel	50	104.1%	10.1%	101.2% - 107.1%	46	16,431
All hours	iiNet	50	96.6%	16.3%	92.8% - 100.4%	70	26,766
All hours	Optus	50	103.5%	10.3%	101.0% - 106.0%	65	23,784
All hours	Optus	100	101.5%	12.0%	98.1% - 104.9%	48	16,869
All hours	Telstra	50	100.6%	15.5%	97.5% - 103.6%	99	37,722
All hours	Telstra	100	100.5%	11.6%	97.2% - 103.7%	48	17,627
All hours	TPG	50	100.4%	12.3%	97.6% - 103.2%	76	26,413

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	94.7%	16.3%	90.9% - 98.4%	73	4,933
Busy hours	Aussie Broadband	100	94.7%	14.4%	91.3% - 98.2%	68	4,198
Busy hours	Dodo & iPrimus	50	94.6%	14.9%	90.0% - 99.2%	40	2,890
Busy hours	Exetel	50	103.1%	10.0%	100.3% - 106.0%	46	3,009
Busy hours	iiNet	50	95.6%	16.3%	91.8% - 99.5%	70	4,877
Busy hours	Optus	50	102.3%	10.5%	99.7% - 104.8%	65	4,214
Busy hours	Optus	100	100.3%	12.6%	96.7% - 103.9%	48	2,845
Busy hours	Telstra	50	99.2%	15.6%	96.1% - 102.3%	99	6,914
Busy hours	Telstra	100	99.0%	11.7%	95.6% - 102.3%	47	3,103
Busy hours	TPG	50	99.2%	12.2%	96.4% - 101.9%	76	4,631

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	83.1%	19.3%	79.6% - 86.5%	122	35,892
All hours	Dodo & iPrimus	20	84.7%	15.0%	80.7% - 88.8%	52	15,633
All hours	Exetel	20	87.6%	14.7%	83.7% - 91.6%	53	14,231
All hours	iiNet	20	79.7%	23.0%	74.9% - 84.6%	86	26,298
All hours	Optus	20	85.8%	15.4%	82.4% - 89.2%	79	23,481
All hours	Telstra	20	85.7%	17.6%	82.8% - 88.7%	137	41,912
All hours	TPG	20	81.4%	22.0%	77.0% - 85.7%	98	27,691
All hours	Superloop	20	87.0%	15.7%	82.3% - 91.8%	42	11,227
All hours	Vodafone	20	87.4%	15.4%	83.1% - 91.7%	50	14,063

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	83.0%	19.3%	79.6% - 86.5%	122	4,065
Busy hours	Dodo & iPrimus	20	84.5%	14.7%	80.5% - 88.5%	52	1,834
Busy hours	Exetel	20	87.3%	14.9%	83.2% - 91.3%	52	1,613
Busy hours	iiNet	20	79.6%	22.9%	74.8% - 84.5%	86	2,973
Busy hours	Optus	20	85.7%	15.4%	82.3% - 89.1%	79	2,562
Busy hours	Telstra	20	85.5%	17.6%	82.5% - 88.4%	136	4,691
Busy hours	TPG	20	81.1%	22.1%	76.7% - 85.5%	97	2,981
Busy hours	Superloop	20	85.6%	17.3%	80.4% - 90.8%	42	1,254
Busy hours	Vodafone	20	87.2%	15.3%	83.0% - 91.4%	50	1,567



RSP	Average daily outages lasting longer than 30 seconds	Standard deviation	95% confidence interval of the mean	Panel size
Aussie Broadband	0.23	0.89	0.11 - 0.36	191
Dodo & iPrimus	0.22	0.40	0.13 - 0.31	77
Exetel	0.36	0.98	0.14 - 0.58	78
iiNet	0.16	0.42	0.09 - 0.23	132
Launtel	0.31	0.83	0.10 - 0.53	57
MyRepublic	0.29	0.43	0.16 - 0.41	47
Optus	0.14	0.32	0.08 - 0.20	119
Telstra	0.24	0.51	0.16 - 0.31	174
TPG	0.39	1.54	0.15 - 0.64	148
Superloop	0.36	1.00	0.12 - 0.59	67
Vodafone	0.53	1.77	0.09 - 0.97	62

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	15.5%	28.1%	38.4%	18.1%
Dodo & iPrimus	19.6%	33.1%	33.9%	13.3%
Exetel	7.3%	24.9%	26.2%	41.5%
iiNet	18.3%	31.5%	39.2%	10.9%
Launtel	45.3%	20.7%	15.4%	18.6%
MyRepublic	29.0%	26.2%	24.3%	20.5%
Optus	29.4%	30.8%	21.3%	18.4%
Superloop	27.8%	26.6%	28.2%	17.4%
Telstra	17.5%	25.1%	15.3%	42.1%
TPG	25.2%	45.2%	22.4%	7.2%
Vodafone	41.7%	25.3%	19.8%	13.3%

# NBN plan tables

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

- The overall speed is the average speed (download or upload) for the particular NBN plan, 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.
  - For example: during testing, we measured an average download performance of 98.0% of plan speed for users subscribed to 100Mbps NBN fixed-line plans with a 95% confidence interval of  $\pm 1.3\%$ . If we were to repeat our sampling 100 times, we expect that this average would fall between 96.7% and 99.3% in at least 95 cases.

For the 12 Mbps plan, the sample size is considered low and results are indicative only.

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	104.0%	6.6%	102.7% - 105.4%	88	33,629
All hours	50	99.6%	13.9%	98.4% - 100.7%	585	213,476
All hours	100	98.0%	13.1%	96.7% - 99.3%	392	135,333
All hours	250	101.3%	14.5%	98.1% - 104.4%	81	27,038

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	102.8%	6.8%	101.4% - 104.2%	88	6,360
Busy hours	50	98.1%	14.2%	97.0% - 99.3%	585	38,700
Busy hours	100	96.6%	13.4%	95.2% - 97.9%	391	24,003
Busy hours	250	98.7%	15.8%	95.3% - 102.2%	81	4,874

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	88.5%	14.6%	84.7% - 92.2%	57	18,039
All hours	20	84.4%	18.4%	83.1% - 85.7%	801	233,793
All hours	40	89.0%	10.8%	87.4% - 90.5%	189	53,266

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	88.2%	14.4%	84.5% - 92.0%	57	2,166
Busy hours	20	84.1%	18.4%	82.9% - 85.4%	798	26,188
Busy hours	40	88.5%	10.8%	86.9% - 90.0%	189	5,843

# NBN technology tables

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

- The overall speed is the average speed (download or upload) for the technology type, measured as a percentage of the plan speed for each subscriber.
- 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.
  - For example: during testing, we measured an average download performance of 104.8% of plan speed for fibre to the premises NBN fixed-line services with a 95% confidence interval of  $\pm 0.8\%$ . If we were to repeat our sampling 100 times, we expect that this average would fall between 103.9% and 105.6% (rounded to 1 decimal place) in at least 95 cases.

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	104.8%	7.5%	103.9% - 105.6%	311	110,045
All hours	Fibre to the curb - FTTC	102.0%	7.6%	100.6% - 103.5%	104	35,574
All hours	Hybrid fibre-coaxial - HFC	103.1%	9.7%	102.0% - 104.3%	254	88,200
All hours	Fibre to the node - FTTN	94.5%	16.0%	93.2% - 95.9%	528	193,460

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	103.2%	8.2%	102.3% - 104.1%	311	19,860
Busy hours	Fibre to the curb - FTTC	100.6%	7.9%	99.1% - 102.1%	104	6,407
Busy hours	Hybrid fibre-coaxial - HFC	101.5%	10.7%	100.2% - 102.8%	253	16,066
Busy hours	Fibre to the node - FTTN	93.1%	16.2%	91.8% - 94.5%	528	34,887

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	91.8%	5.8%	91.2% - 92.5%	311	89,674
All hours	Fibre to the curb - FTTC	91.1%	5.7%	90.0% - 92.2%	104	29,006
All hours	Hybrid fibre-coaxial - HFC	90.6%	10.3%	89.3% - 91.8%	254	71,786
All hours	Fibre to the node - FTTN	79.4%	21.6%	77.5% - 81.2%	528	157,272

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	91.6%	5.8%	91.0% - 92.2%	310	10,106
Busy hours	Fibre to the curb - FTTC	90.9%	5.6%	89.8% - 92.0%	104	3,249
Busy hours	Hybrid fibre-coaxial - HFC	90.1%	10.4%	88.8% - 91.4%	252	8,136
Busy hours	Fibre to the node - FTTN	79.1%	21.6%	77.2% - 80.9%	528	17,609

Technology	Average daily outages lasting longer than 30 seconds	Standard deviation	95% confidence interval of the mean	Panel size
Fibre to the premises - FTTP	0.21	0.81	0.125 - 0.30	311
Fibre to the curb - FTTC	0.20	0.55	0.099 - 0.31	104
Hybrid fibre-coaxial - HFC	0.46	1.48	0.280 - 0.64	254
Fibre to the node - FTTN	0.28	0.82	0.209 - 0.35	528

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	41.2%	28.4%	10.8%	19.6%
Fibre to the node - FTTN	25.0%	25.9%	29.5%	19.6%
Fibre to the premises - FTTP	21.2%	37.5%	22.2%	19.1%
Hybrid fibre-coaxial - HFC	29.4%	32.0%	20.5%	18.0%

# 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.

- The overall speed is the average speed (download or upload) for the state, measured as a percentage of the plan speed for each panellist.
- 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.
  - For example: during testing, we measured an average download performance of 97.1% of plan speed for NBN fixed-line services in WA, with a 95% confidence interval of  $\pm 3.0\%$ . If we were to repeat our sampling 100 times, we expect that this average would fall between 94.1% and 100.1% (rounded to 1 decimal place) in at least 95 cases.

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	100.3%	13.4%	98.9% - 101.6%	390	140,706
All hours	ACT	96.7%	14.4%	93.1% - 100.2%	64	22,309
All hours	VIC	100.5%	11.5%	99.3% - 101.8%	321	114,656
All hours	QLD	98.5%	13.9%	96.5% - 100.5%	194	66,925
All hours	WA	97.1%	15.1%	94.1% - 100.1%	98	35,602
All hours	TAS	100.5%	12.8%	97.2% - 103.9%	55	19,977
All hours	NT + SA	101.2%	12.3%	98.4% - 103.9%	75	27,104

# 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	96.0%	97.0%	56	58	96.5%
Dodo & iPrimus	100.0%	95.0%	33	18	98.2%
Exetel	100.0%	100.0%	42	16	100.0%
iiNet	100.0%	90.0%	56	30	96.5%
MyRepublic	100.0%	93.0%	15	26	95.6%
Optus	100.0%	100.0%	57	43	100.0%
Superloop	96.0%	95.0%	21	35	95.4%
Telstra	100.0%	100.0%	85	43	100.0%
TPG	100.0%	90.0%	64	30	96.8%
Vodafone	100.0%	90.0%	30	22	95.8%

There were 112 busy hours across the 28 day period from 1st February 2022 to 28th February 2022. 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	23%	91%
Dodo & iPrimus	49%	82%
Exetel	57%	97%
iiNet	50%	99%
Launtel	85%	92%
MyRepublic	44%	91%
Optus	77%	98%
Superloop	79%	98%
Telstra	24%	92%
TPG	58%	100%
Vodafone	65%	75%

# 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	191	11	6%
Dodo & iPrimus	77	3	4%
Exetel	78	3	4%
iiNet	132	8	6%
Launtel	57	1	2%
MyRepublic	47	3	6%
Optus	119	4	3%
Other RSPs	45	1	2%
Superloop	67	1	1%
Telstra	174	9	5%
TPG	148	10	7%
Vodafone	62	4	6%
Total	1,197	58	5%

As highlighted earlier in the 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	10	0	0%
Fibre to the node - FTTN	25	64	1	2%
Fibre to the node - FTTN	50	324	35	11%
Fibre to the node - FTTN	100	119	17	14%
Fibre to the node - FTTN	Other NBN plans	11	0	0%
Fibre to the node - FTTN	All NBN Plans	528	53	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	791.8 Mbps	177.2 Mbps	762 Mbps - 821.6 Mbps	136	44,412
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	715.4 Mbps	173.5 Mbps	686.3 Mbps - 744.6 Mbps	136	7,940
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	46 Mbps	1.9 Mbps	45.6 Mbps - 46.3 Mbps	136	36,111
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	45.5 Mbps	3 Mbps	45 Mbps - 46 Mbps	136	4,059
Plan	Average daily outages lasting longer than 30 seconds		Standard deviation	95% confidence interval of the mean		Panel size
Very High Speed	0.31		1.1	0.1 - 0.48		136
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	24.8%	31.9%	25.5%	17.8%		

# 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	110.2%	25.9%	104.6% - 115.8%	81	28,596
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	87.6%	31.1%	80.8% - 94.3%	81	5,075
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	73.2%	32.6%	66.1% - 80.3%	81	23,599
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	59.4%	31.8%	52.5% - 66.4%	81	2,606
Technology	Average daily outages lasting longer than 30 seconds		Standard deviation	95% confidence interval of the mean		Panel size
Fixed Wireless	0.29		0.55	0.2 - 0.41		81
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	21.4%	20.3%	23.2%	35.1%		









# 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	102%	11%	98% - 106%	33	10,641
Period	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	101%	12%	97% - 105%	33	2,045
Period	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	89%	5%	87% - 91%	33	8,685
Period	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	89%	6%	87% - 91%	33	1,037

# 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.
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.
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.
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.
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 / Plan	A retail product, for example 50/20 Mbps or 100/40 Mbps.
Plan Speed	The download and upload speeds associated the relevant retail plan. For example, plan speeds for NBN50 are 50 Mbps down and 20 Mbps up.
SamKnows	The independent testing provider appointed to conduct testing for Measuring Broadband Australia. <a href="https://samknows.com/">https://samknows.com/</a>
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.