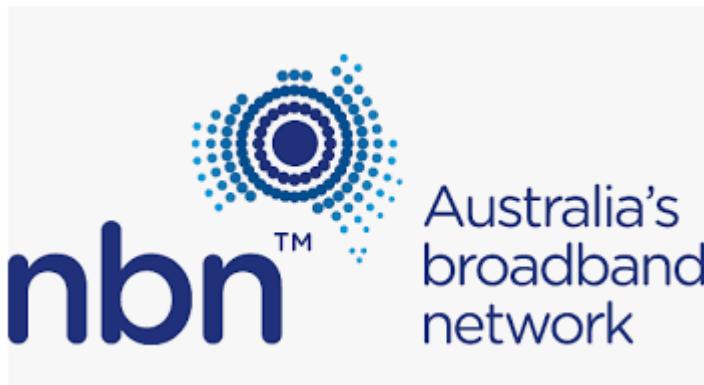


U3A Brisbane

Connecting to the NBN

Be better informed



Overview of this Presentation

This presentation covers the following main topics:

Brief NBN History

Data Caps

What is the NBN?

Choosing a Provider

Current Progress

Phone Issues

Rollout Map

The NBN Connection Process

Services Replaced

Possible Problems

NBN Technologies

NBN Alternatives

Measuring Speeds

The Future

NBN Speed Tiers

Summary

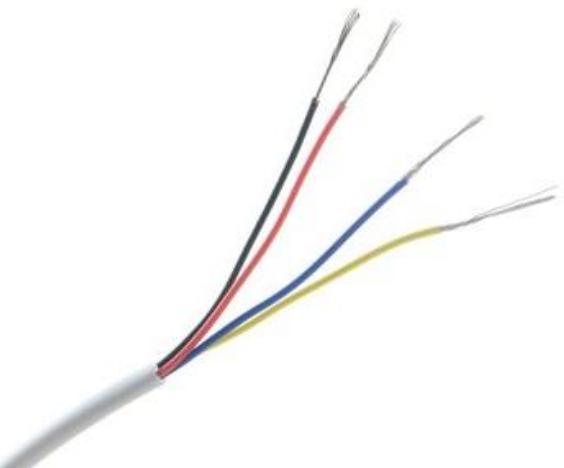
NBN – A Brief History

- The history is fraught with political/ideological differences.
- Conceived by Labor Government 2007 as private/public partnership. But private investors could not be found.
- Commenced 2010 with projected 93% Fibre-to-Premises (FTTP) for completion 2020, estimated cost \$43 billion.
- Changed by Coalition Government 2013 to Multi-Technology-Mix (MTM) for completion 2016, est. cost \$29 billion.
- Current estimated completion 2020, est. cost \$49 billion.

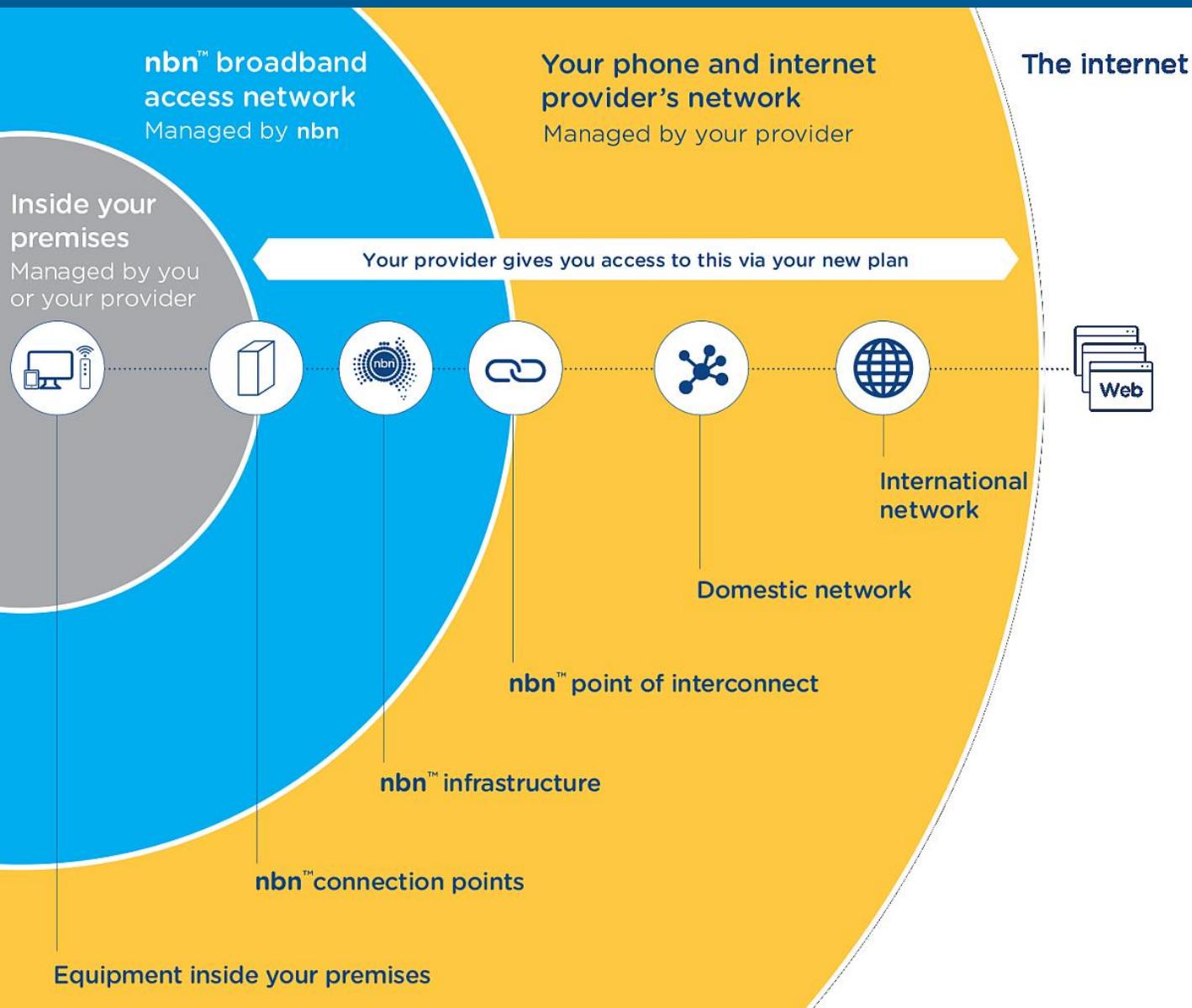
Why is new Broadband needed?

Current copper telephone network installed from early 20th century is no longer fit-for-purpose.

Wiring is old and unable to provide fast speeds needed to support a modern digital economy.



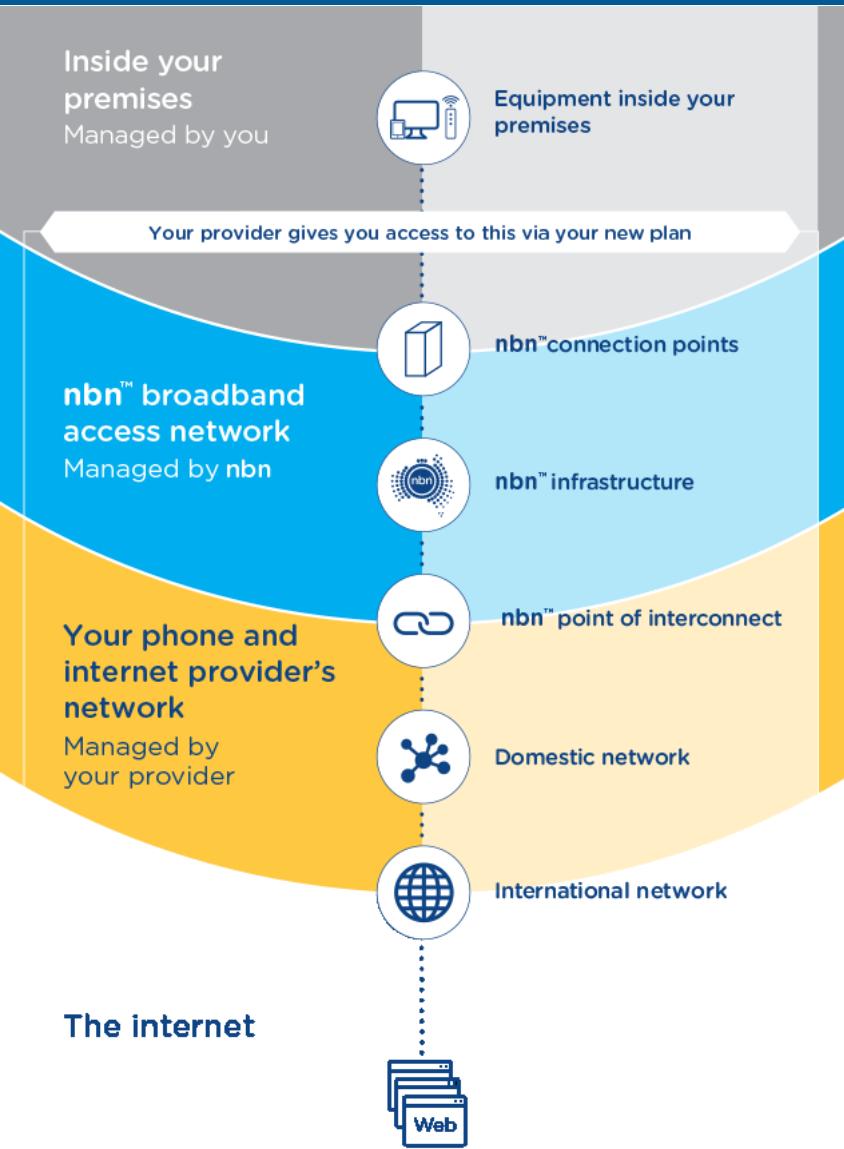
What is the NBN?



The NBN provides the connection between your premises and the nearest Point of Interconnect (POI). There are 121 POIs in Australia.

POIs in Brisbane:
Acacia Ridge, Aspley, Bundamba,
Camp Hill, Eight Mile Plains,
Goodna, Petrie, Slacks Creek,
Woolloongabba.

What is the NBN?



NBN Co. acts as a wholesaler, but consumers deal with their chosen ISP (now called RSP = Retail Service Provider).

Your existing ISP will likely contact you when NBN is available and offer a new plan.

You may also choose to change to a new provider.

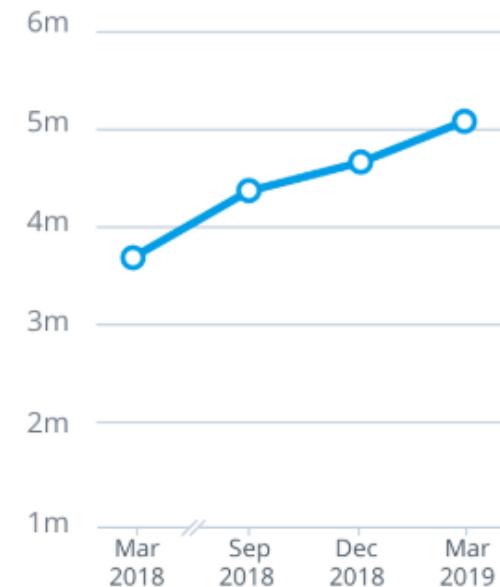
Installation Progress to Date

Ready to connect



8.8 million Australian homes and businesses are able to connect to the **nbn™** access network – compared with 6.5 million in Mar 2018.

Connected homes and businesses



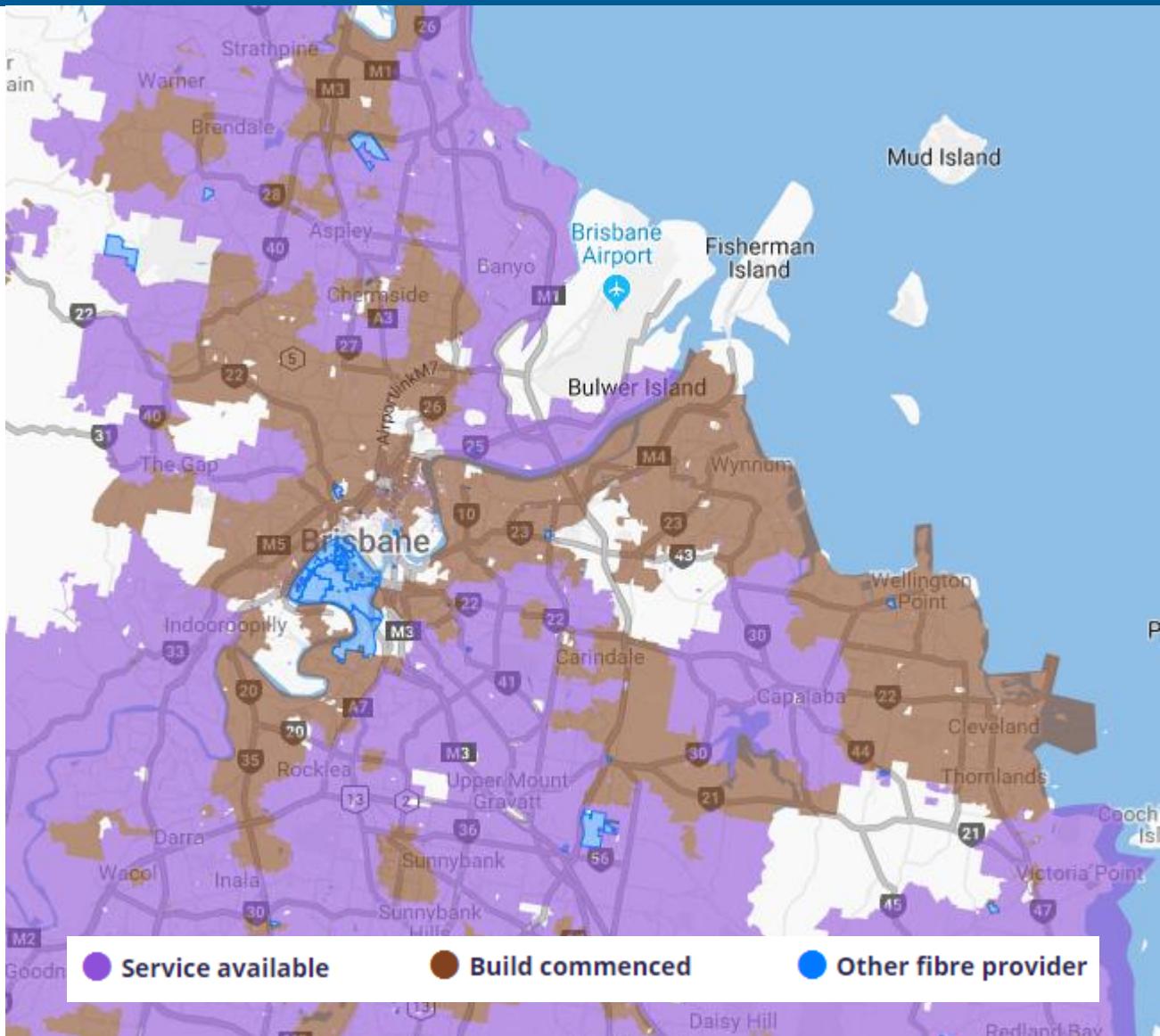
5.1 million homes and businesses connected to a plan over the **nbn™** access network – compared with 3.7 million in Mar 2018.

Source: <https://www.nbnco.com.au/corporate-information/about-nbn-co/updates>

NBN Rollout Map

The Rollout Map shows current progress in implementing NBN services across Australia.

<https://www.nbnco.com.au/residential/learn/rollout-map>



Services that will be Switched Off



These services will be switched off, generally 18 months after NBN is declared ready for service in your area:

- landline phones
- ADSL, ADSL2 Internet
- cable Internet

Foxtel will remain (but changing to satellite delivery). Pre-existing fibre services will remain, e.g. South Brisbane.

NBN Technologies

One of these 7 methods will be used to connect your premises to the NBN.
NBN Co. decides which method is used in your area.

- FTTP – (Optical) Fibre to the Premises.
- FTTC – Fibre to the Curb - uses copper phone cable from kerb to premises.
- HFC – Hybrid Fibre Coax. Uses Telstra cable network installed in 1990s. Coaxial cable runs from street to premises.
- FTTB – Fibre to the Basement (used in multi-tenant buildings).
- FTTN – Fibre to the Node - uses phone cable from a Node (street corner) to premises. Now largely abandoned.
- Fixed Wireless – Used in semi-rural areas.
- Sky Muster – Satellite delivery used in rural/remote areas.

Advantages of Optical Fibre over Copper

- Much higher data rates and low signal attenuation.
- Lower cost.
- More secure.
- Fibre uses light instead of electric signals. (Actually infra-red for commercial fibre).
- Light is much higher frequency therefore provides much greater bandwidth.



What Technology will deliver NBN to my premises?

Go to the NBN website and search your address:

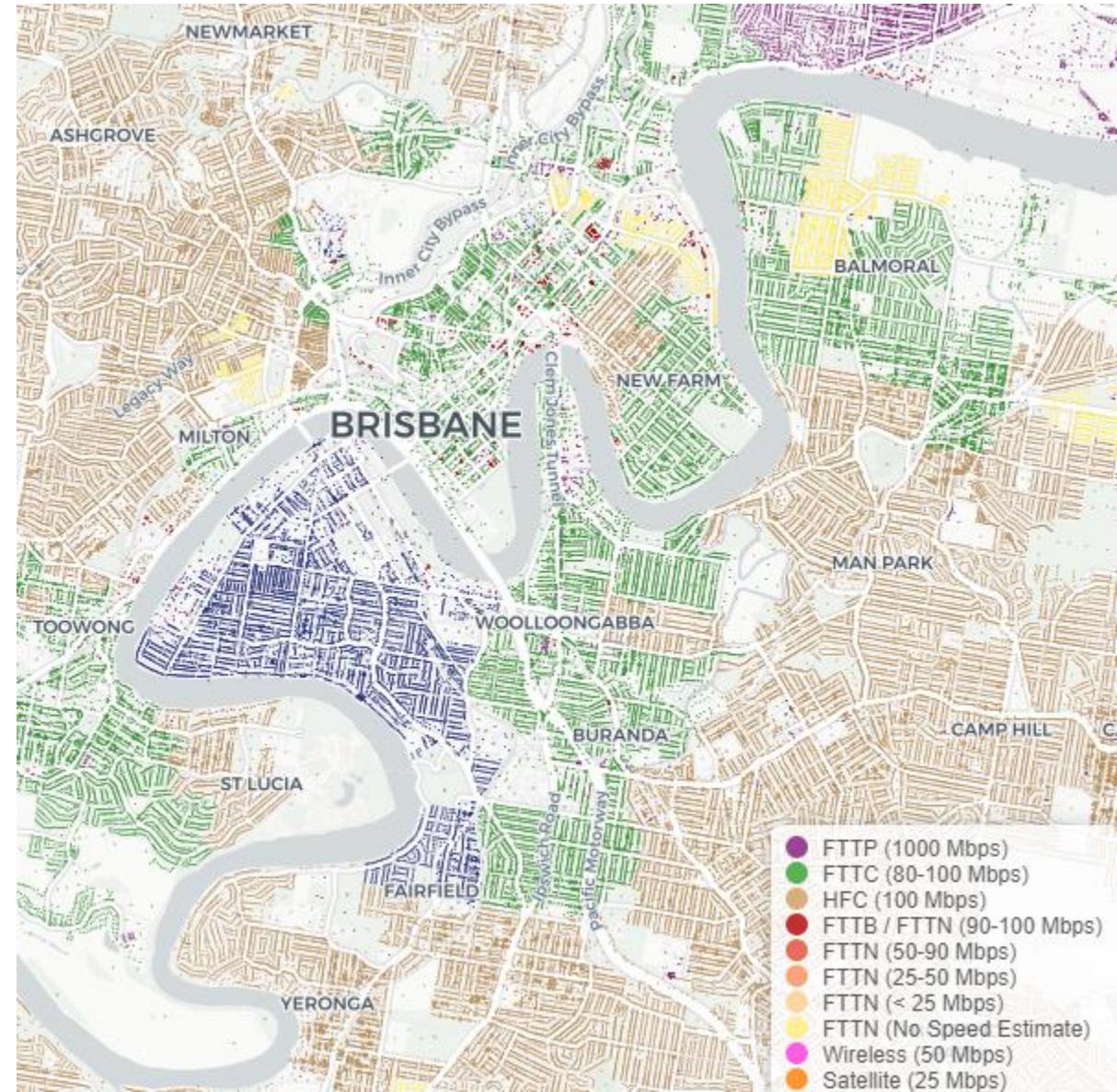
<https://www.nbnco.com.au/>

The result will show:

1. The approximate month when NBN will be available at your location.
2. Current Status, e.g. Build Commenced, Ready for Service, Connected.
3. Technology to be used, e.g. HFC, FTTC, FTTP

Alternatively, go to the Technology Map and drill down to your location:

[Technology Map](#)



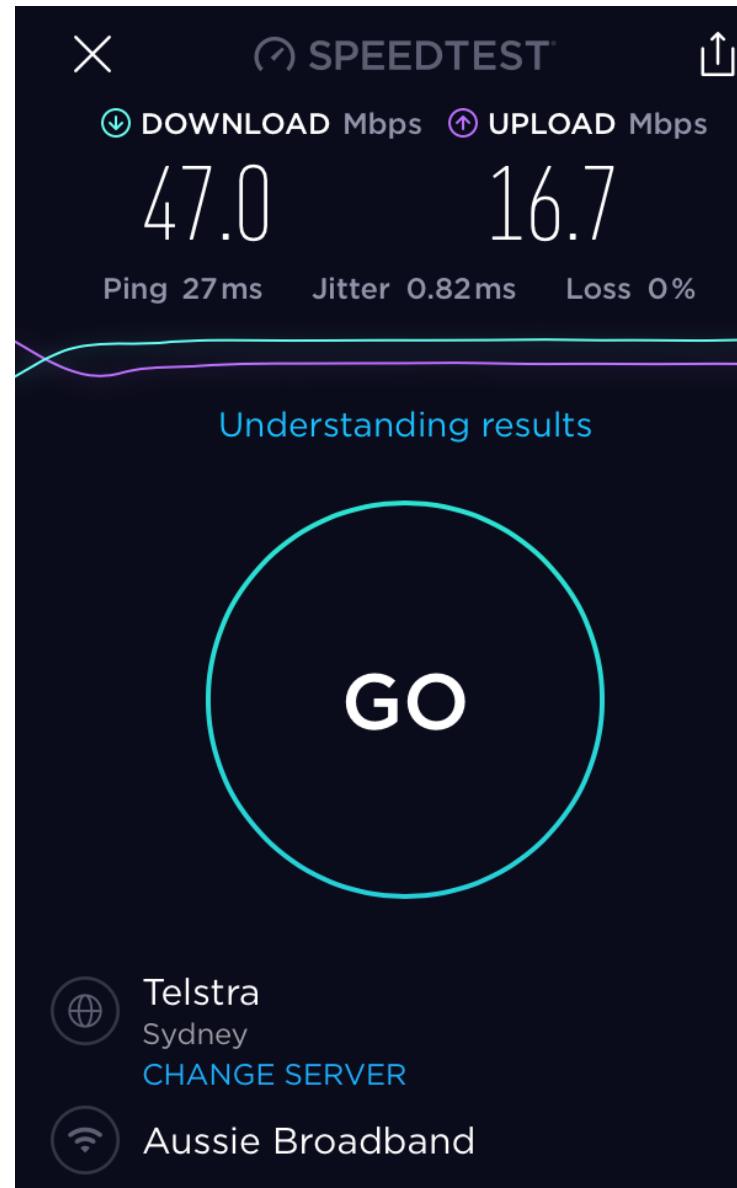
Measuring your Download and Upload speeds

Best tool is Ookla's speedtest.net:
<https://www.speedtest.net/>

Example here is phone version
(requires app install).

Speed will differ with server chosen,
e.g. a Perth site will be slower.

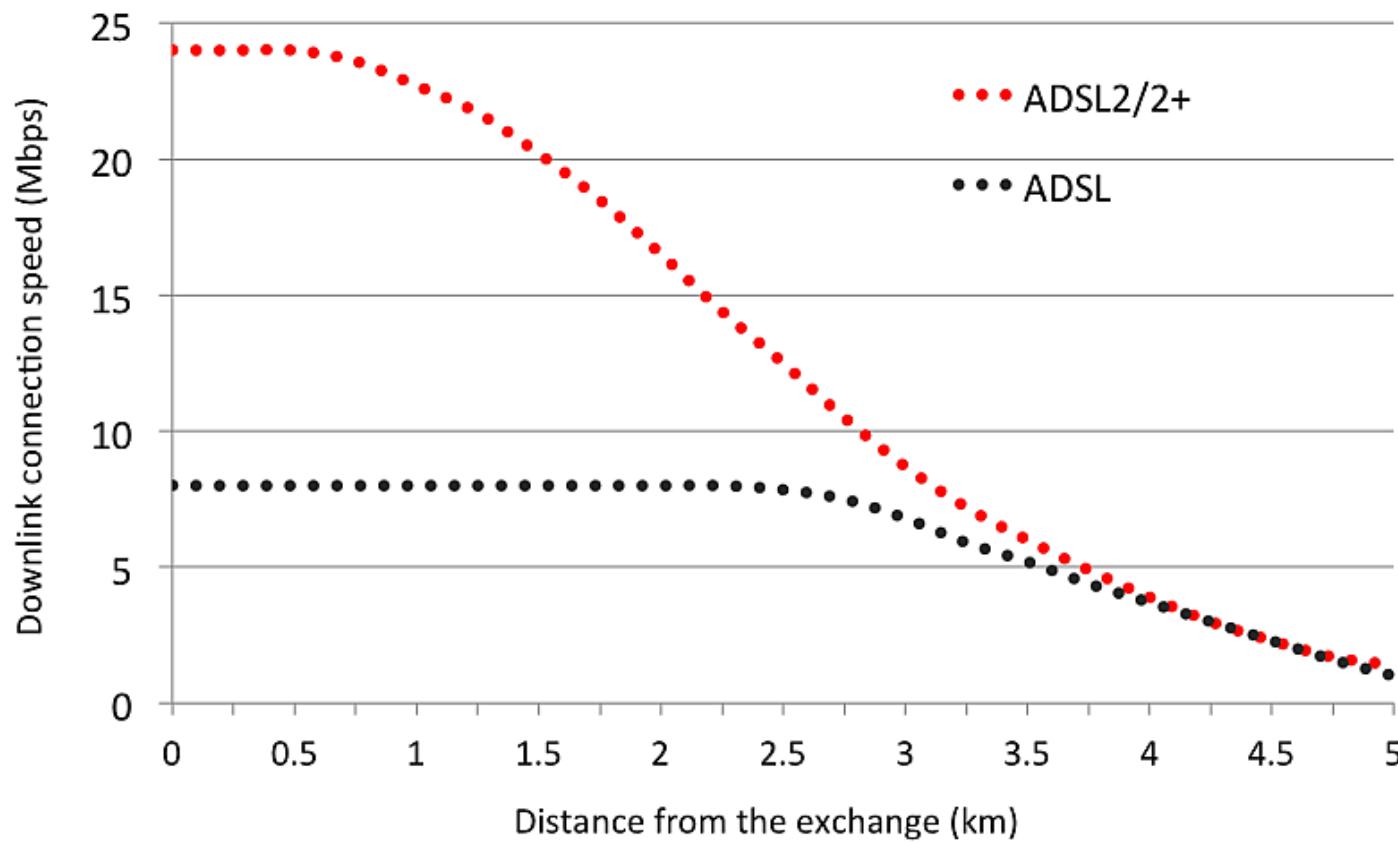
It's a good idea to check your speeds
before and after NBN installation.



Ping (or latency or lag) is a measure of signal delay. It should be below about 30ms (milliseconds).

Jitter measures variability in latency. It should be below 1-2ms.

ADSL and Cable speeds



With ADSL, the subscriber has no choice about data speed. Download speeds typically range from 8Mbps to 20Mbps depending on distance from the exchange. Upload is typically 1Mbps. Note: 1 megabyte (MB) is 8 megabits (Mb).

Current Cable Internet subscribers (using Telstra/Foxtel HFC cable) typically obtain about 30Mbps download and 1-5Mbps upload.

NBN Speed Tiers

nbn12 (Basic) – 12Mbps Download, 1Mbps Upload

nbn25 (Standard) – 25Mbps Download, 10Mbps Upload

nbn50 (Standard Plus) – 50Mbps Download, 20Mbps Upload

nbn100 (Premium) – 100Mbps Download, 40Mbps Upload

These are nominal or maximum speeds. Typical speeds experienced are 80-90% of nominal figures.



Choosing your NBN speed

Choice depends on your needs, usage, number of people using your Internet service, and budget.

nbn25 is a good starting plan for 1-2 people in a household.

nbn50 is the most popular, chosen by 57% of subscribers.

nbn100 is for heavy users, gamers etc.

Choosing your data cap

Again, choice depends on your needs, usage, number of people using your Internet service, and budget. The higher the cap you choose, the more you will pay per month.

The best guide to your likely requirement is your current usage. Log in to your user account with your current ISP and find out your recent usage per month in gigabytes (GB). Both downloads and uploads count.

Current Australian average is 85GB per household per month.

Choosing your data cap (cont.)

Heaviest data usage is streaming movies and video, e.g. Netflix, Stan, YouTube, video calls.

This site may give you an estimate of how much data you need:
Data Usage Quiz:

<https://quiz.leadquizzes.com/q/vCiBkr>

If you select an Unlimited data plan,
you may be paying more than
necessary.



Choosing a Provider (ISP/RSP)

Easiest path is to stay with your current ISP. However, you will often be able to obtain a better plan by switching.

If you change providers, and you have email addresses using your current provider's domain, e.g. johnsmith@bigpond.com, you will need to change your email address.

Having a generic email address (e.g. gmail, hotmail) makes it much easier to change providers.

Broadband Performance Data (ACCC)

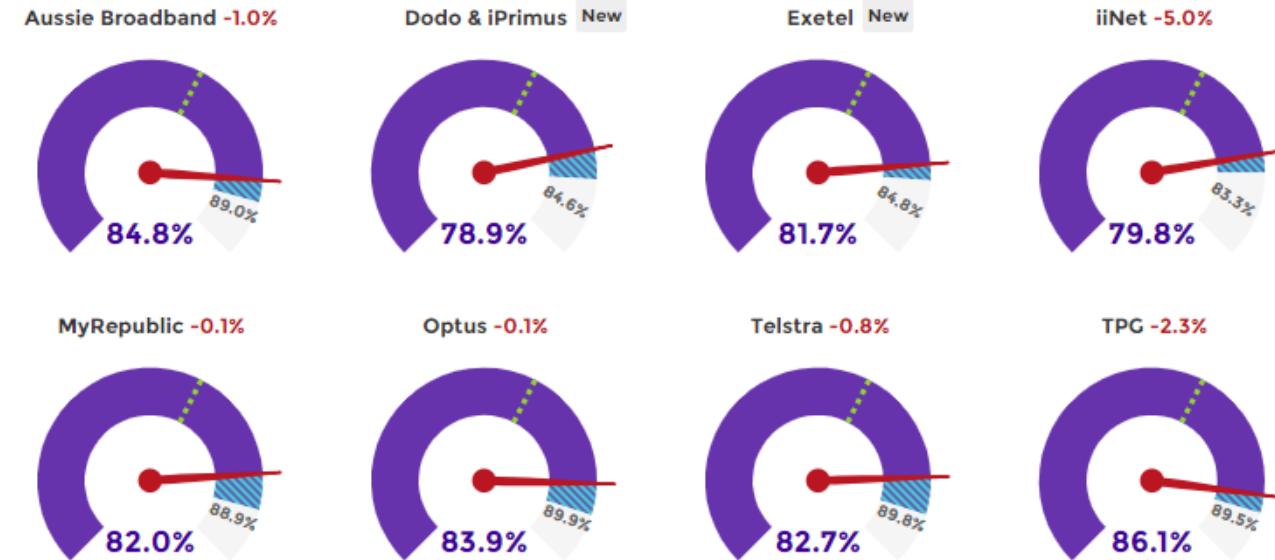
Since March 2018, the ACCC has been monitoring user NBN experience quarterly, using equipment hosted by a large volunteer testing panel.

This measures delivered speeds for the major providers.

To view full latest report:
[Broadband Performance Data](#)

NBN plan speeds delivered during busy hours and the busiest hour

- Download speeds - busy hours
- Download speeds - busiest hour
- Upload speeds - busy hours



Busy hours = 7.00pm to 11.00pm.

= Benchmark level 60%.

+ - Percentage point changes compared with previous quarter's measurements.

What differentiates Providers?

Providers can influence their wholesale cost per user depending on how much bandwidth they purchase from the NBN.

CVC parameter is the most crucial:

CVC – Connectivity Virtual Circuit. This is the amount of bandwidth allocated per user for a given POI. On average it is 1.65Mbps per user, but NBN Co. encourages a higher allocation.

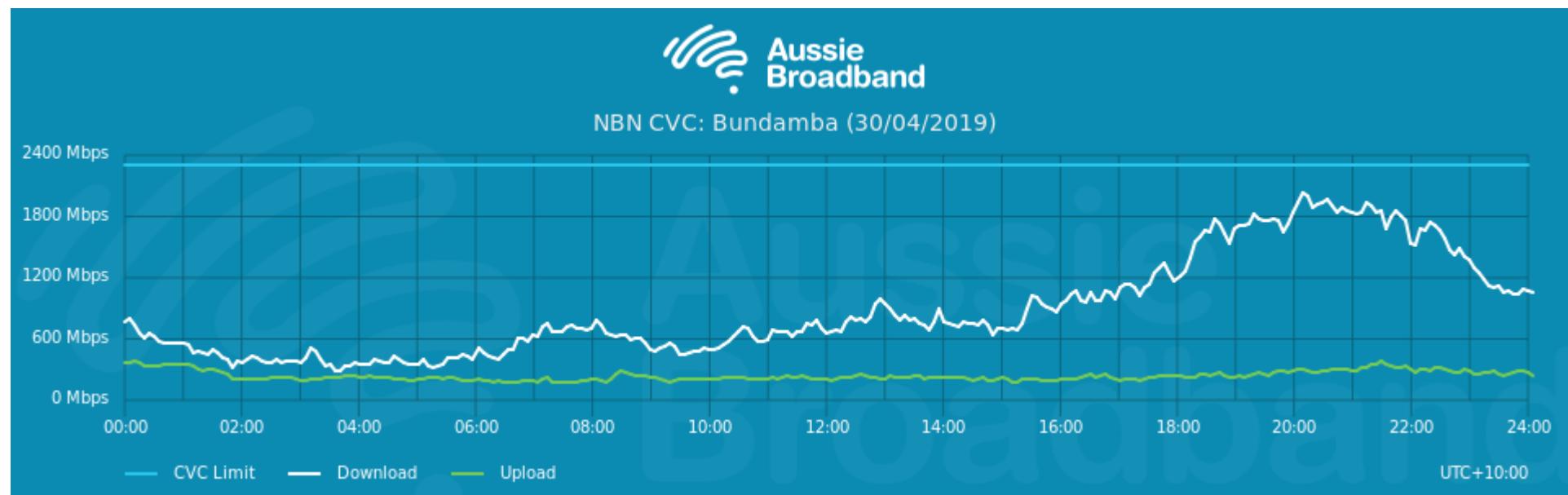
Providers can “game” the system by minimising the CVC purchased. NBN Co. attempts to counter this and improve overall system performance by offering various discounts to providers to maximise CVC.

Consumers are the pawns in this game.

CVC in practice

Aussie Broadband is the only provider that publishes its CVC information. Their stated objective is a CVC of 1.95Mbps per user.

<https://www.aussiebroadband.com.au/cvc-graphs/>



Network Congestion

Network congestion can occur occasionally.

Imagine a network with 1000 users, each of whom has selected a 50Mbps plan. A simplistic calculation would mean a bandwidth allocation of 50Gbps (50×1000), which is obviously overkill.

If a provider allocates a CVC of 2Mbps per user, or total bandwidth of 2000Mbps (2Gbps), they are assuming an average of 4% of users sending or receiving data at any one time.



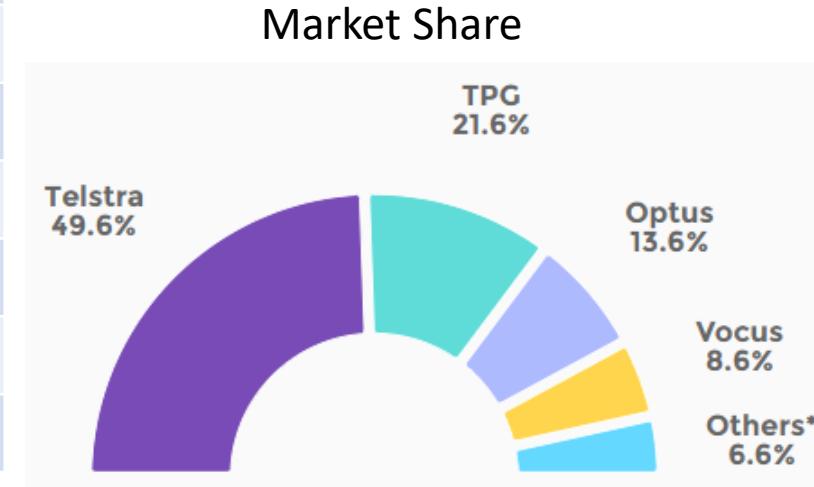
But at certain times actual demand would exceed this. So each user's speed drops to accommodate the total traffic.

Plan Comparison

RSPs make it difficult to compare plans, because of included extras. This table is an attempt to compare similar plans for the 50Mbps speed tier. Your NBN modem/router generally incurs an upfront payment (\$100-\$200) unless you agree a contract.

Provider	Data Limit (GB)	Cost per month	Notes
Telstra	Unlimited	\$89	includes calls
Optus	Unlimited	\$70	calls \$10 extra (Weird plans!)
TPG	Unlimited	\$70	Calls \$10 extra
iiNet (TPG)	Unlimited	\$70	Calls \$10 extra
Aussie Broadband	500GB	\$74	First month free, calls \$10 extra
iPrimus (Vocus)	Unlimited	\$90	Calls included
Dodo (Vocus)	Unlimited	\$75	Calls \$10 extra

Some RSPs may offer Seniors plans.



Phone Costs

Generally, you can keep your landline phone number, even if you change to a new provider. The phone service will change from the old analogue service to a digital VoIP service (Voice over Internet Protocol).

If you have multiple wired phone points in your home, you may not necessarily be able to use them. A cordless system with a master and satellites is a better option.

An NBN installation always includes a phone “line”, even if not used. Call plans are optional (generally \$10 per month extra), or you can pay-as-you-go for calls.

If you have a medical alarm or alarm system that uses the phone network, you will need to discuss with your ISP.

Phone-only plans

Subscribers with an existing landline phone but no Internet may wish to maintain this.

This is certainly possible, but not all providers offer a “phone only” plan. Instead, consumers may need to subscribe to an Internet service with a very low speed tier and low data cap. They even need to install a modem in order to plug in the phone. Cost is generally \$40+ per month, similar to an existing landline phone. TPG seems to have the best phone-only plan (\$40 including calls).



An Alternative to phone-only plans

A simpler approach for a phone-only customer is to obtain a legacy mobile phone (e.g. Nokia 3310) and purchase a SIM from a low-cost provider, e.g. Amaysim 1GB plan \$10 per month for unlimited calls and texts.

There is no need to subscribe to an NBN service in this case (although NBN cable will still be run to the house).



Hybrid Fibre Coax (HFC)

HFC is the most common technology now being rolled out in Australian capital cities, including Brisbane.

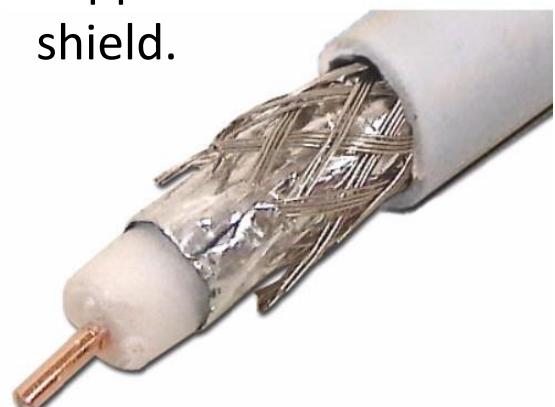
It mainly uses existing cable laid by Telstra in the 1990s. It may be underground or overhead (strung from electricity poles).

Only about one-third of premises serviced by HFC cable have existing lead-in cable from the street. The remainder had to be installed for NBN.

In November 2017, NBN was forced to halt HFC installations for 6 months in order to carry out “remediation” works.

There are typically 100-400 homes on each local HFC loop.

Coaxial Cable – central copper core with metallic shield.



The NBN Connection Process 1

The process described here is illustrated with HFC cables and equipment. However, the steps are similar for all connection types except wireless or satellite. With FTTN and FTTC (fibre to curb), there is no external Utility Box since existing copper phone cable is used.

Step 1 - Build. Lead-in cable installed from street to premises. If you already have cable Internet or Foxtel, this step is unnecessary. NBN technicians are permitted to enter your property under the *Telecommunications Act*. They will terminate the cable in a Utility Box usually on an exterior wall. The location is generally determined by the point where the existing telephone cable enters.

After the cable is installed there may be a delay of many months before there is any further progress.



The NBN Connection Process 2

Step 2 - Readiness. Your local area is declared Ready for Service. You will generally be advised by your current ISP, or you may find out by checking the NBN site. From this date you have 18 months before existing telephone and Internet (e.g. ADSL) is turned off. Your existing services will remain working during this period.



To connect to NBN you need to select a plan, either from your current provider or a new provider.

Your provider will ship a VDSL2 modem/router and negotiate a date for the NBN installation technician to call, generally 2-3 weeks away. You must be at home for this visit (4-hour window).

Cheap
Fast
Reliable

Pick Any Two

The NBN Connection Process 3

Step 3 - Installation. An NBN technician will arrive on the agreed day and run a cable from the external Utility Box to a coax wall socket (for HFC) inside the house. The location will depend on ease of access. You may not have a lot of choice.

2 power sockets will be needed, one for the NBN Connection Box (Arris CM8200 modem for HFC) supplied by the technician, and one for the router shipped by the RSP. Connection box for technologies other than HFC will look different to that shown here.

The service will be tested and activated by the technician and you should have Internet available within an hour.

When you are satisfied that NBN is working, your old router should be turned off and your old plan cancelled.



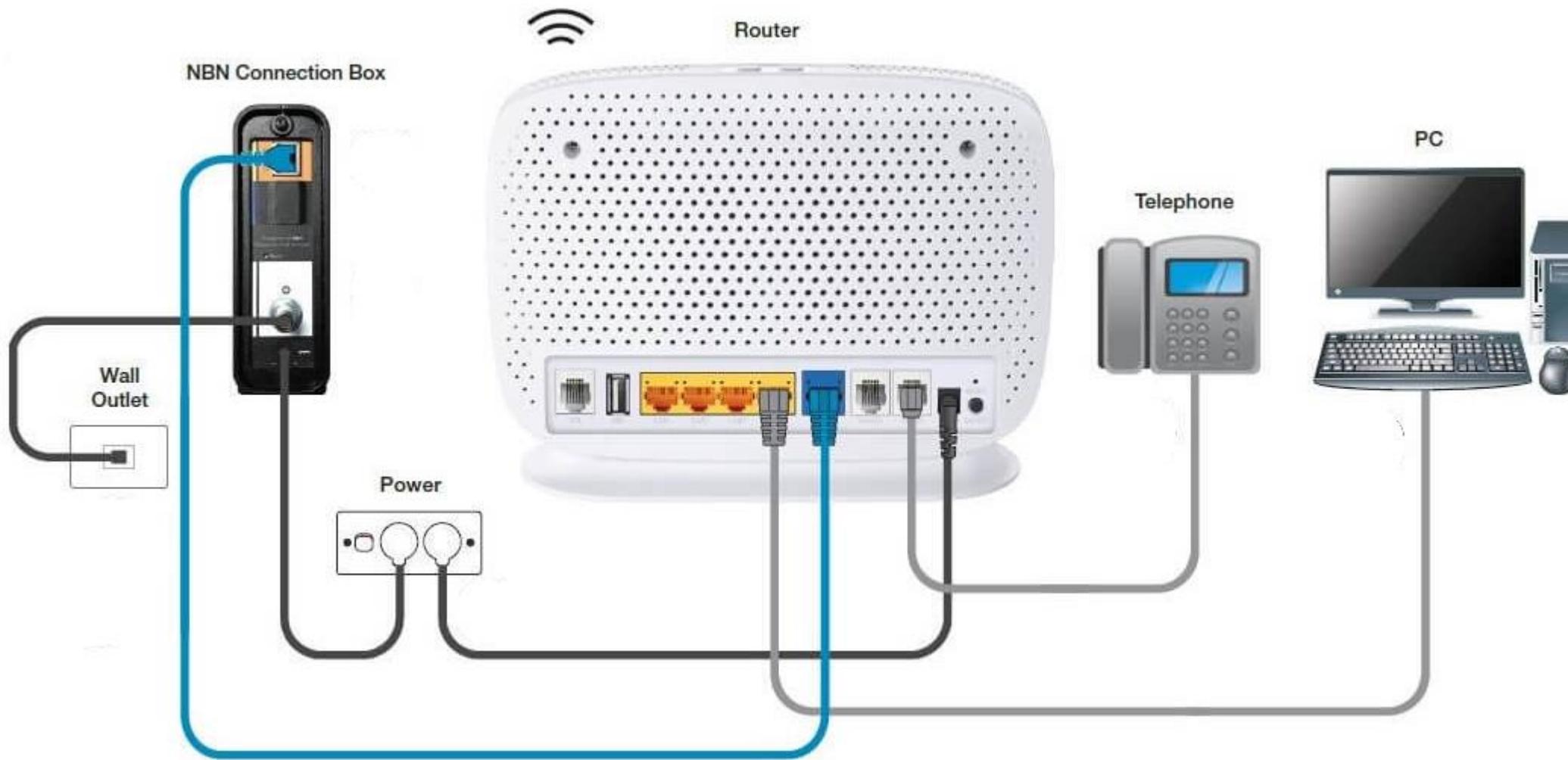
The NBN Connection Process 3 (cont.)

Connecting the router is simply a matter of plugging the supplied Ethernet cable from the router's WAN port into the Ethernet socket on the Arris Connection Box.



Beware. Telstra offers a “professional installation” for \$240. This mainly involves plugging in the Ethernet cable.

Internal Equipment Connections



Other Technologies

The previous slides illustrated the coaxial wall connection that is needed for a HFC connection.

If you are receiving FTTC or FTTN, the Connection Box will plug into your existing telephone wall socket. No external Utility Box is required.

More information:

<https://www.nbnco.com.au/residential/learn/network-technology/fibre-to-the-curb-explained-fttc>

With FTTP, optical fibre will be connected directly to the Connection Box from the external Utility Box.

More information:

<https://www.nbnco.com.au/residential/learn/network-technology/fibre-to-the-premises-explained-fntp>

Some Possible Problems

WiFi. Your new router will have pre-set WiFi ID and password. There will likely be two channels, 2.4GHz and 5GHz. Any devices that connect via WiFi will need to have passwords re-set, e.g. printers. You can use WPS to do this automatically for printers. Alternatively you can change the router WiFi settings to the same as previously.

Standby power. If the power fails, both Internet and phone services won't work. You may choose to obtain a standby power supply (UPS) if this risk is important to you.

Location. The position where the service is installed may be unsuitable. The NBN technician will try to install at your preferred location, but if access is difficult you may have little choice.

Plans. Ensure that you fully understand the terms of the plan you have signed up for (with RSP). There may be a hidden upfront cost for the router (\$100 - \$200), although it is usually supplied free if you agree to a 24-month contract. Read the fine print!

Phone. If you opt for a phone, ensure that you understand call costs. There is usually a \$10 call plan that covers unlimited calls (within Australia).

Alternatives to the NBN

While it is compulsory to have NBN supplied to your house (exterior lead-in cable installed), you are not obliged to connect.

1. One alternative is wireless broadband. Currently this is available on the 4G network for about \$70 per month with a 200GB limit. Speed is limited to about 10Mbps.
2. 5G is coming within the next year or two. This promises to deliver very fast Internet, but plans are yet to be announced. While this is an option for many, most commentators believe there will always be a need for wired services owing to radio spectrum limits.
3. Your mobile phone can provide Internet and WiFi for other devices, e.g. laptop, printer, using the built-in WiFi Hotspot in your phone. Caution needs to be exercised if you have a low data cap on your phone plan.

The Future

While some of the deployed delivery methods may appear to have a limited future, new technologies are available that will dramatically increase speeds.

HFC modems (Arris CM8200) supplied by NBN are DOCSIS 3.1 enabled, but not yet implemented. This standard improves spectral efficiency and enables much higher speeds to be obtained over HFC cable (1Gbps and above).

Other technologies are in development for other service types, e.g. Gfast for FTTC and NG-PON for fibre.

Summary – Take Home Message

NBN installation is proceeding at a rapid pace and the project will be completed in 2020.

Most home installations proceed smoothly and with no problems. No need to panic.

There is no hurry. You have 18 months to decide what to do, from the date NBN is ready in your suburb.

You do need to carefully consider competitive plans. You need to decide what speed and data cap suits your needs.

You should decide whether you really need a home phone. It will cost you an extra \$10 per month.

The location of the NBN equipment in your home needs thought, but you won't necessarily have full control.



Useful Reports

NBN consumer experience. Households and businesses—the end-to-end journey

Australian Communications and Media Authority (ACMA)

https://www.acma.gov.au/-/media/Research-and-Analysis/Research/pdf/NBN-consumer-experience_households-and-businesses.pdf

Broadband Performance Data (ACCC)

<https://www.accc.gov.au/consumers/internet-phone/broadband-performance-data>

NBN Glossary of Terms

<https://www.nbnco.com.au/utility/glossary-of-terms>

How We're Tracking – NBN Co. Monthly Dashboard

<https://www.nbnco.com.au/corporate-information/about-nbn-co/updates>

Prepared by Greg Taylor, U3A Brisbane, May 2019.

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