

The **nbn** effect:

How the **nbn**TM network adds value to our lives

August 2021

Commissioned by





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NBN Co is a wholesaler only and provides wholesale services to phone and internet providers. To order a plan, end customers should contact their preferred phone and internet provider.



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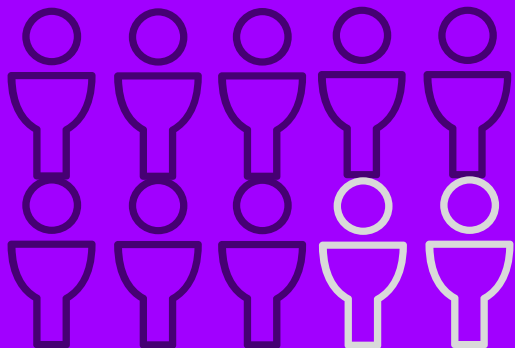
The nbn™ network is the main and preferred way Australians connect to the internet¹

88% of all internet downloads are done via the nbn™ network



8 in 10

Users prefer the nbn™ network because it is faster, more affordable and more reliable than mobile alternatives



Australians derive significant value from the nbn™ network

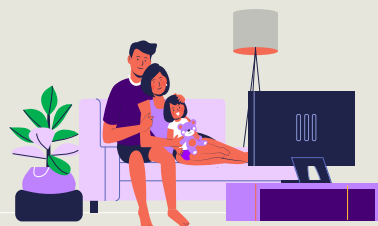
The average household derives

\$1,920

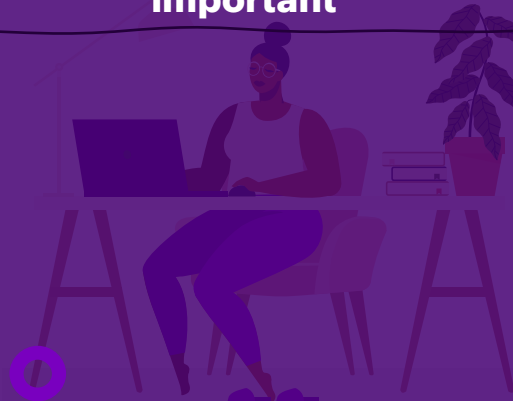
per annum in value from their nbn™ powered plan. This is 2.18 times what they pay for their service on average

\$15.7b

per annum is the aggregate value nbn users derive



Essential tasks like working remotely and online banking continue to be important



5 out of the top 7

most important activities conducted on the nbn™ network are essential tasks required for modern life

170 hours / year

are saved per year due to activities performed online on the nbn™ network

But increasingly, we are spending more time on activities that enrich our lives online

91% of users

Agree that the nbn™ network enables them to do what they value most in life



14 hours/week

nbn users are spending up to 14 hours a week streaming video and 14 hours gaming online²



2 out of 3 users

were reliant on the nbn™ network to stay in touch with loved ones during COVID-19

Executive summary

The nbn™ network is the main and preferred way Australians connect to the internet at home¹.

The internet is a technological, social and economic force that now shapes almost all facets of modern life. Australians continue to derive immense value from the internet as shown by both the time they spend and importance they placed on the internet.

The **nbn™** network is the main way Australians access the internet at home. Currently, the **nbn™** network powers 89% of home broadband plans in Australia and drives 88% of Australia's data downloads on the internet.

The **nbn™** network is also the preferred way Australians connect to the internet. 87% of users reported they agree the **nbn™** network is more reliable, and 85% of **nbn** users reported **nbn** provides cheaper data than mobile.

Australian households derive \$1,920 of value from the nbn™ network per year.

When aggregated across Australia, households derive ~\$15.7bn per year of value from the **nbn™** network. This is more than twice the amount the average Australian household currently pays for plans powered by the **nbn™** network. The value

Australians extract from the **nbn™** network can be attributed to two key categories:

- (1) Essential tasks – performing life and work-related tasks on the **nbn™** network makes the lives of Australians more convenient; saving time and effort.
- (2) Enriching activities – connecting with others and accessing entertainment via the **nbn™** network is enriching the lives of Australians.

The nbn™ network is making our lives more convenient: saving Australians ~170 hours per year by enabling essential tasks to be performed online.

COVID-19 has amplified our reliance on the **nbn™** network for essential tasks: with 167% growth in time spent on online work tools, 45% growth in telehealth and 29% increase in online learning powered by the **nbn™** network².

These essential online tasks fundamentally make our lives significantly more convenient, with the average person saving ~170 hours (~4 working weeks) per year.

These time savings generated from the **nbn™** network have enabled **nbn** users to spend an

additional 80 minutes per week doing what matters most to them offline such as spending time with family and friends.

Increasingly, the nbn™ network is a catalyst for deeper enrichment and connection in our lives: 91% of users say that the nbn™ network enables them to do what they value most in life.

Currently, **nbn** users spend up to 2 hours a day on activities that enable them to connect or be entertained. COVID-19 strengthened our reliance on the **nbn™** network for activities beyond essential tasks, with engagement in leisure activities increasing. The time Australians spent on activities that enrich our lives such as online gaming and social media increased by up to 12% when compared to pre-COVID-19². Moreover, 2 in 3 of users said they were reliant on the **nbn™** network to stay in touch with loved ones and 3 in 4 users relying on the **nbn™** network for online entertainment during COVID-19².





01 The value of the **nbn™** network

02 The **nbn™** network is essential

03 The **nbn™** network enriches

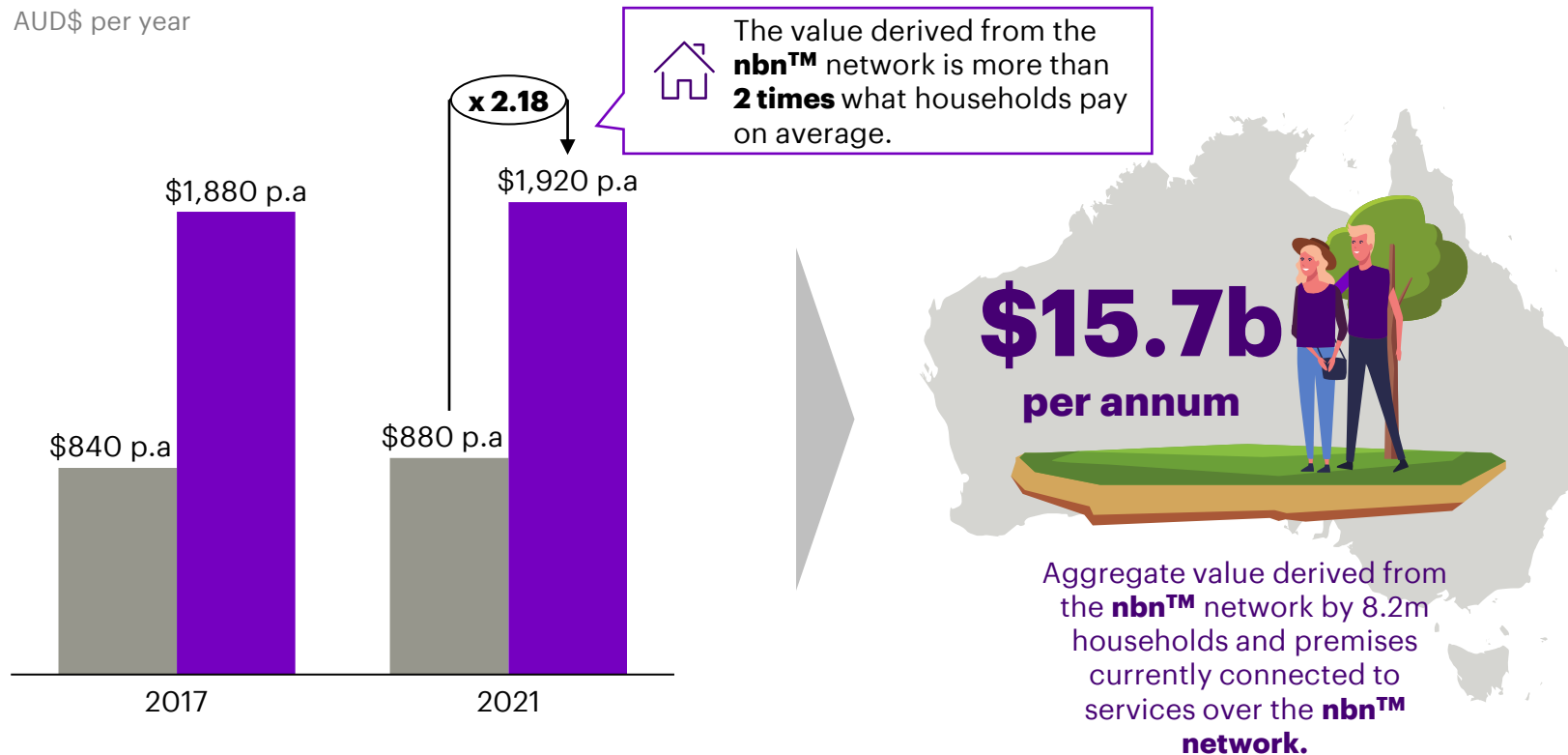
accenture

nbn users derive ~\$1,920 in value from the network every year, more than twice what they currently pay for their service

nbn users derive \$1,920 in value from the nbn™ network every year; this equates to \$15.7b nationwide

- Average annual cost of nbn™ powered plans
- Average annual value derived from nbn™ powered plans

AUD\$ per year



What does 'value' mean?

\$1,920 is the articulation of the average Australian's 'willingness to pay' for nbn™ powered plans. It represents the overall value they place on their nbn™ powered plan.

How do we estimate 'value'?

A Discrete Choice Experiment was used to estimate willingness to pay. This is a survey technique that requires respondents to select from a hypothetical selection of nbn™ powered plans (with different speeds, data, inclusions and prices). These results are used to understand consumer preferences and the value of options available in the market currently.

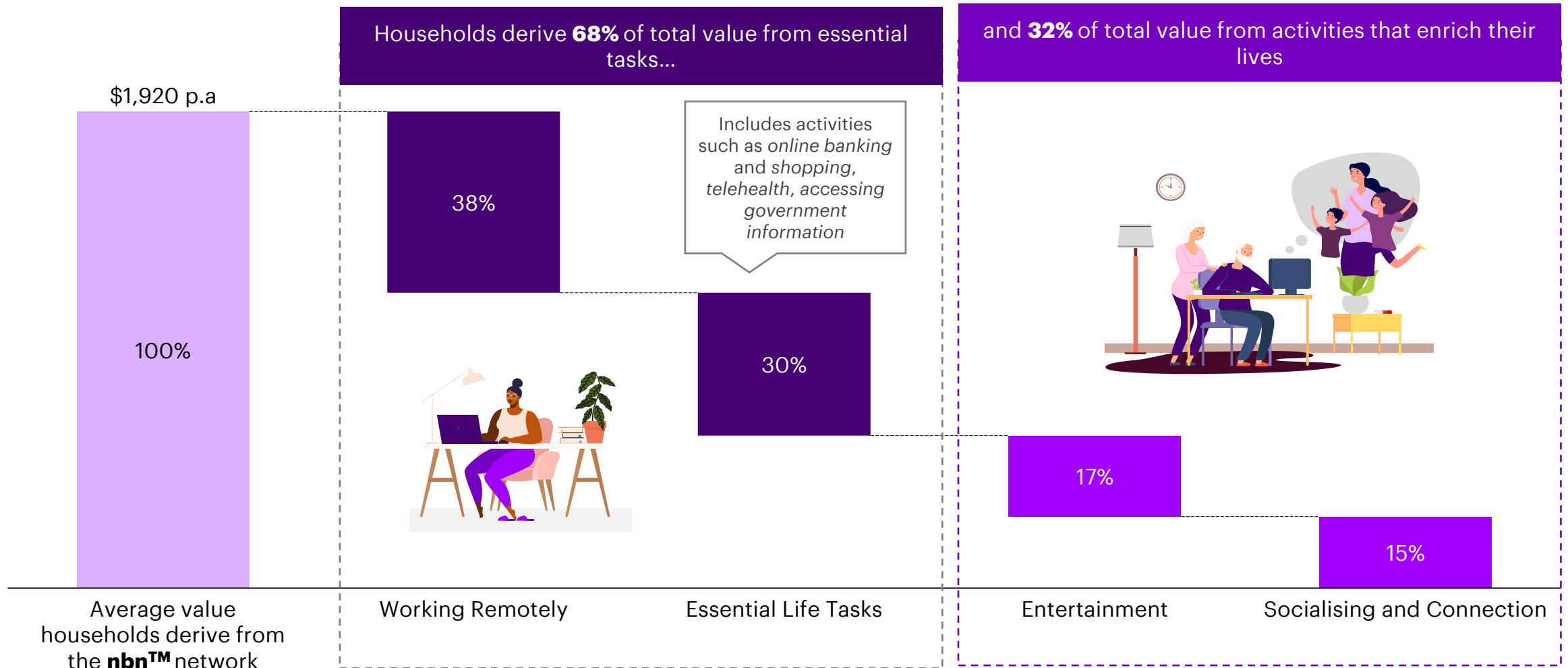
Why is it higher than what consumers pay?

In economics, the value consumers derive over the price they pay for is called consumer surplus. For digital goods, this tends to be high because digital goods often provide immense value for free or at low costs. For example:

- Wikipedia provides a wealth of valuable knowledge to users for free
- E-commerce platforms collate a breadth of options for consumers to choose and compare from for free

A more detailed explanation can be found in the appendix.

Australian households derive ~\$1,305 p.a. in value from conducting essential tasks online and \$615 p.a. in value from activities that enrich their lives

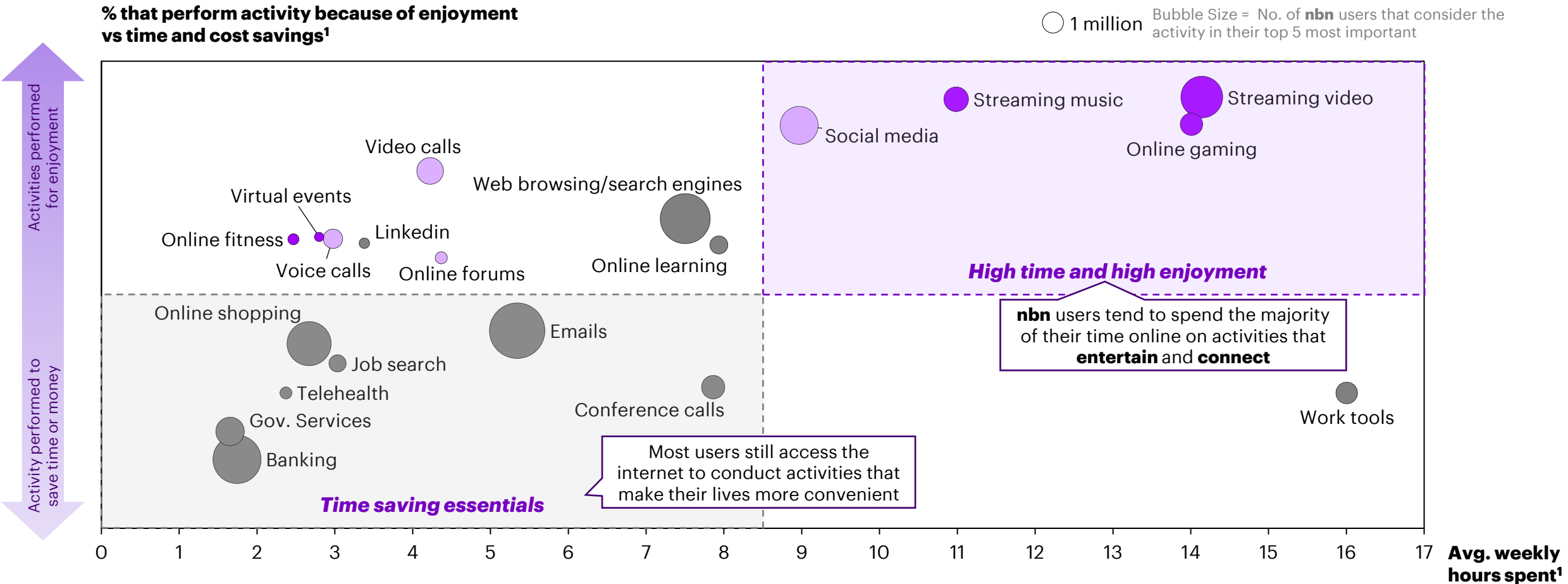


The majority of nbn users consider essential online tasks more important, however they tend to spend more time on activities they find enjoyable

More nbn users consider time saving essentials important, but tend to spend more time on activities they find enjoyable

Share of users that enjoy the activity (%); average time spent every week on the activity (hours)

● Essentials ● Social ● Entertainment



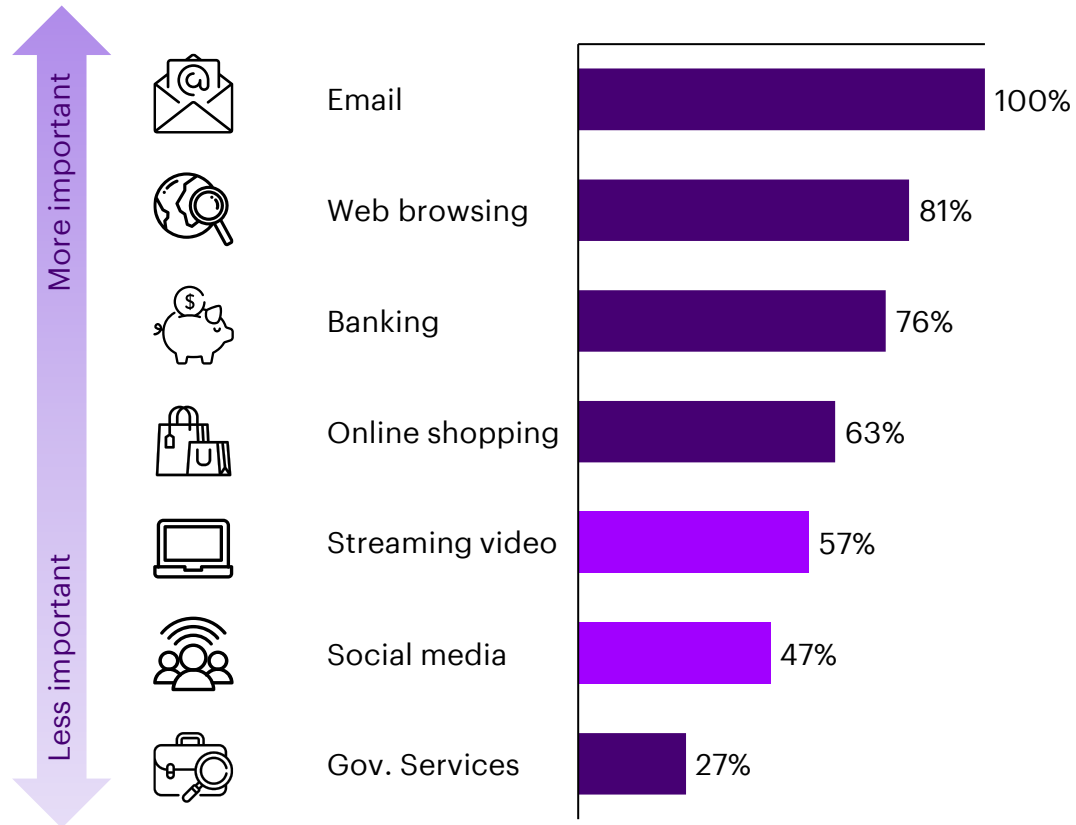
SOURCE: Consumer sentiment survey of 2,420 respondents in March 2021, Accenture. Results are based on the survey questions "Q. Out of the activities you use fixed home broadband for, which are the most important? Please select your top 5 activities."; "Q. How many hours a week do you spend on each of these activities?" and "Q. What do you value most about this online activity? - (1) Doing this activity online saves me time or money or (2) The activity is enjoyable or adds value to my life". NOTE: 1. Average time spent on online activities and % of users that enjoy the activity are calculated based off people who selected the activity in their "top 5 most important activities"; 2. The activity "Using smart home / IOT devices" has been excluded due to uncertainty in actual time spent for devices that are connected to the internet 24/7.

Essential tasks are still considered the most important activities conducted over the nbn™ network, but increasingly, users are spending time on activities that enrich their lives

5 of the 7 most important activities over the nbn™ network are essential tasks

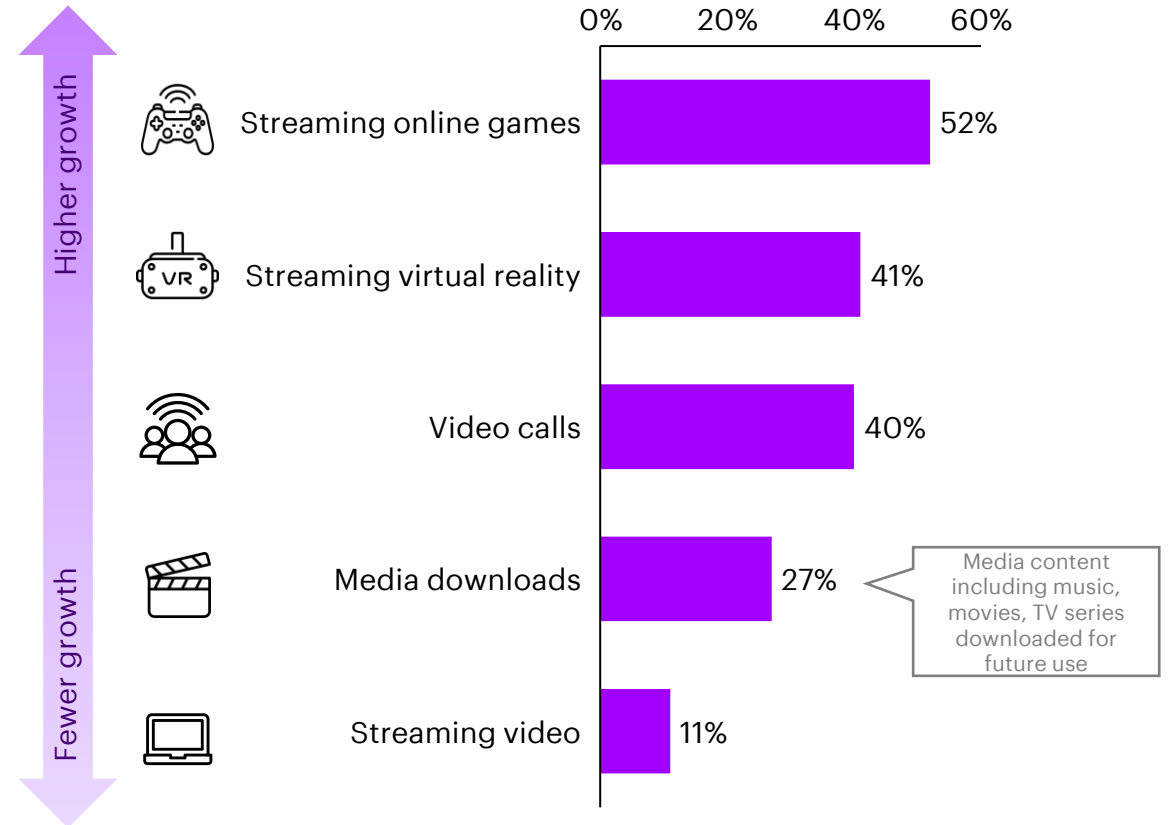
Relative importance of online activities

■ Essential tasks ■ Enriching activities



But increasingly, more time is to be spent on activities that enrich lives

Forecasted annual growth rate in minutes spent by online activity to 2028



Essential tasks



Enriching activities



01 The value of the **nbn**TM network

02 The **nbn**TM network is essential

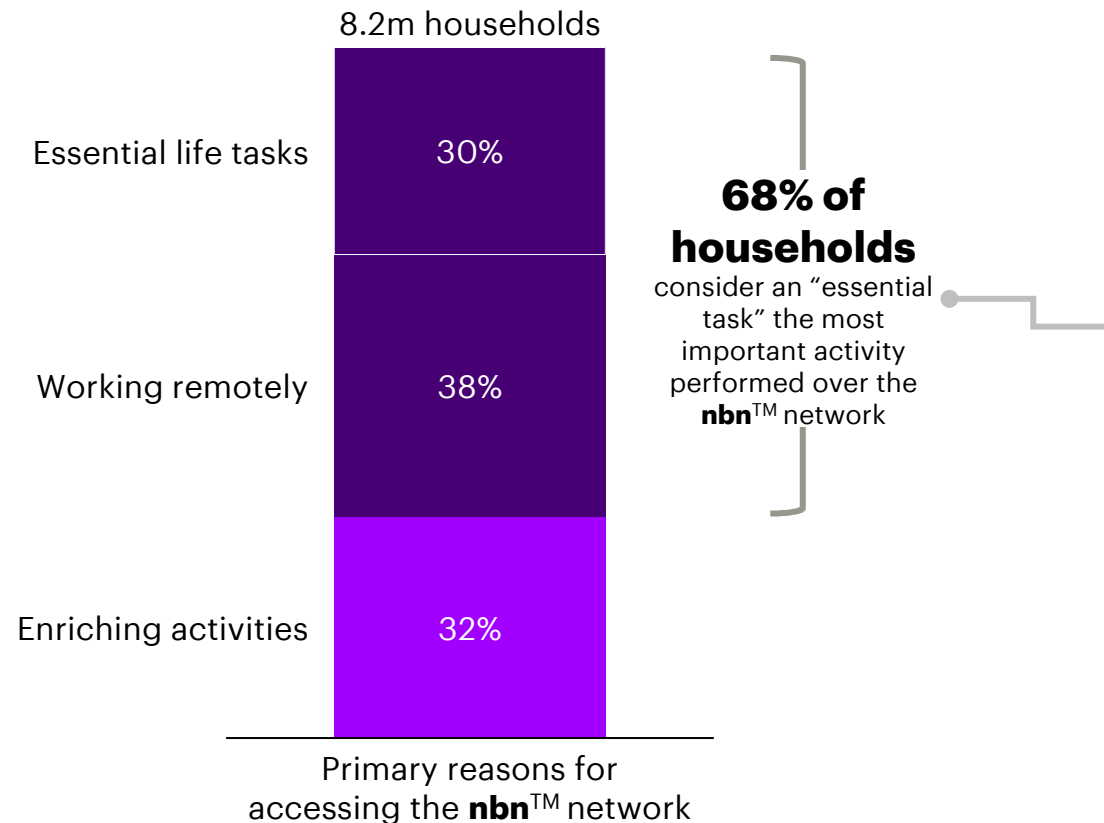
03 The **nbn**TM network enriches



5.6 million households consider everyday work and life-related tasks their most important online activity

5.6 million households primarily use the nbn™ network for essential tasks

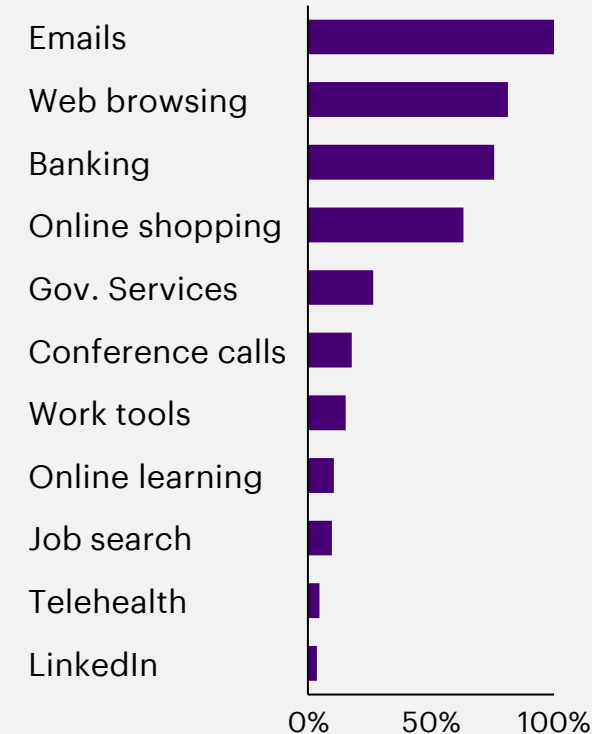
% households that think an essential life or work activity is the most important



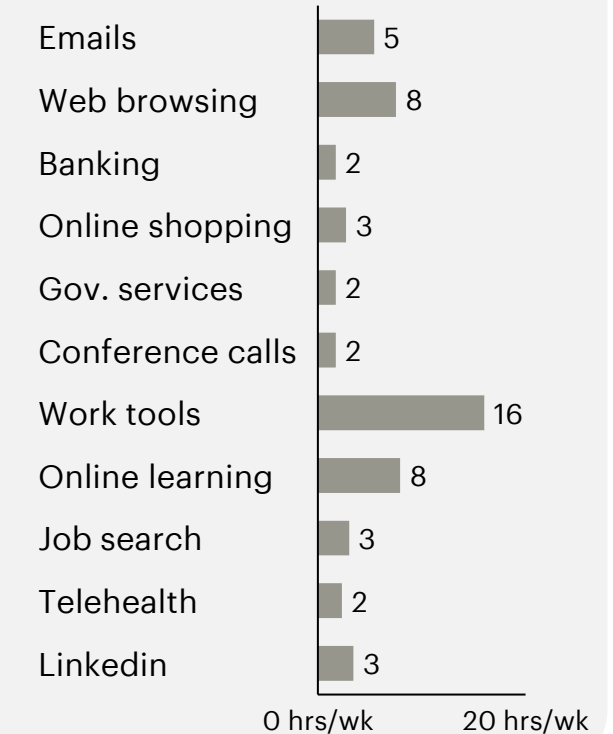
The most important essential tasks are e-mail, web search and banking

Relative importance based off top activity; top activity rebased at 100; Hours per week

Stated importance of essential online tasks



Avg. hours spent per week on essential tasks

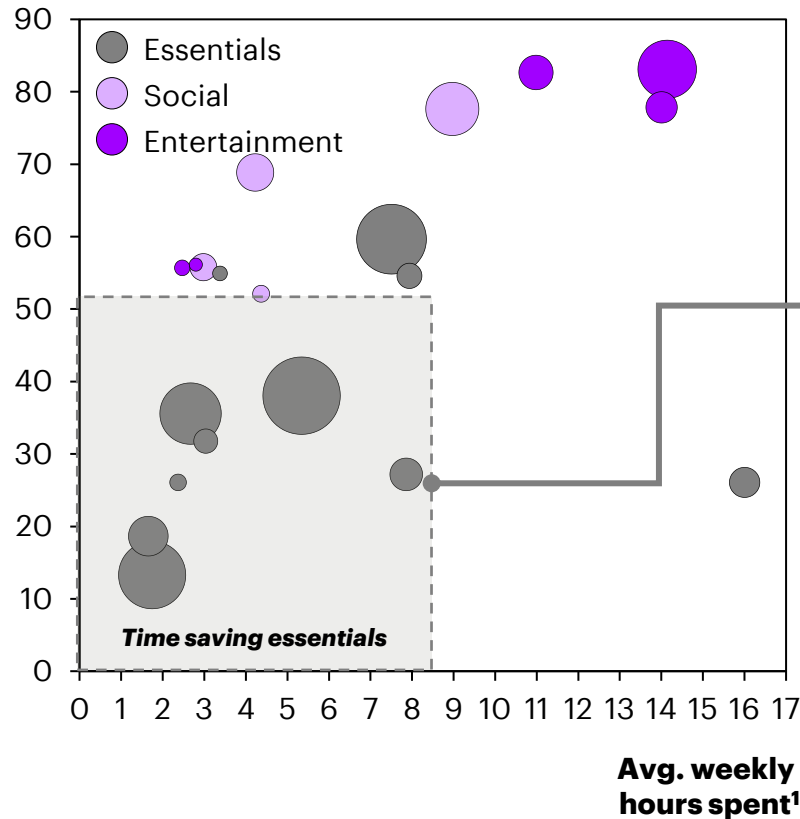


During COVID-19, time spent using work related services over the nbn™ network increased by up to 175%

Online activities by enjoyment and time spent

% Users that enjoy the activity; Avg. hours spent/week

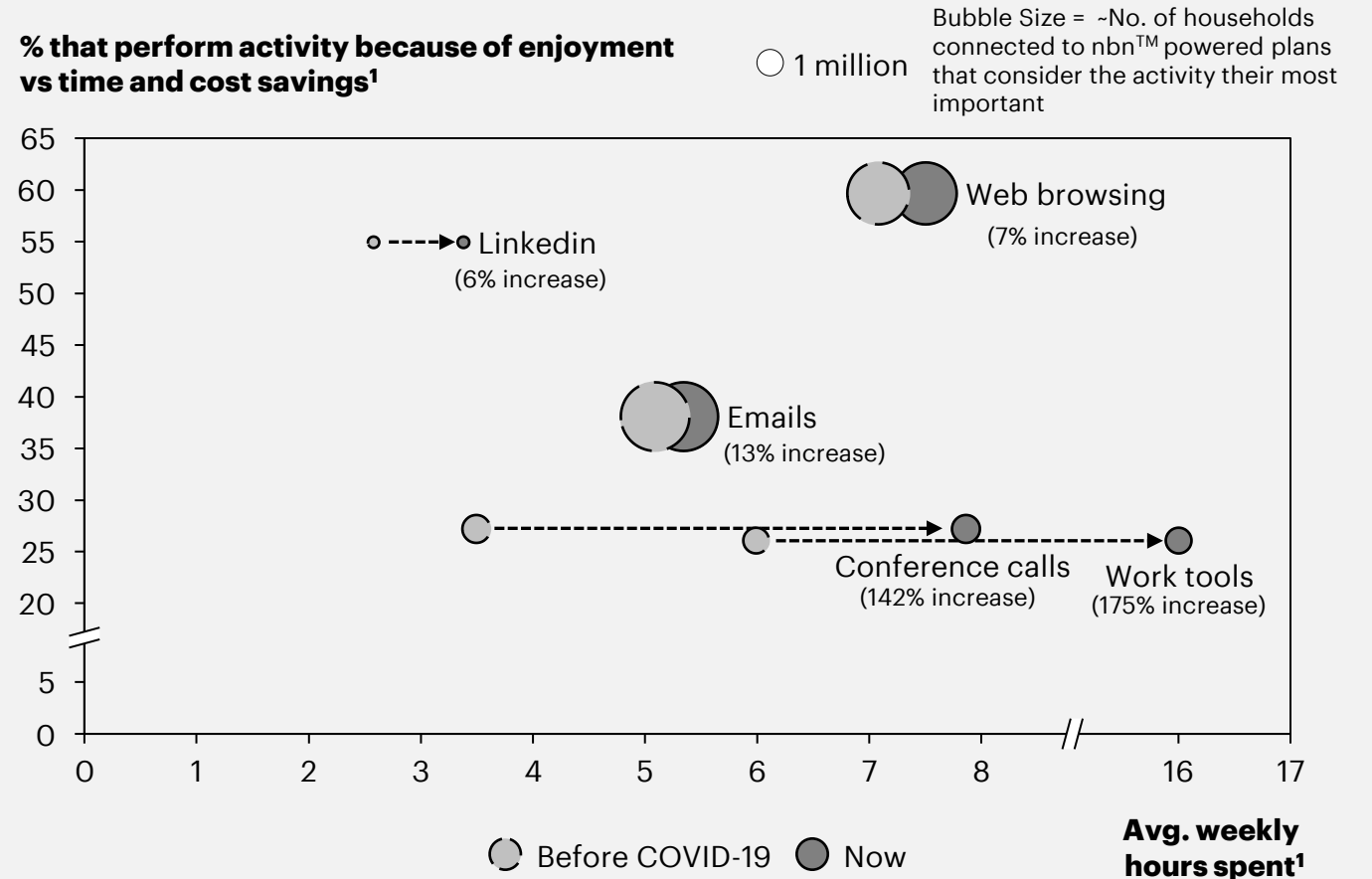
% that perform activity because of enjoyment vs time and cost savings¹



COVID-19 has increased the time nbn users spend on work related activities

Share of users that enjoy the activity (%); average time spent every week on the activity (hours)

% that perform activity because of enjoyment vs time and cost savings¹



SOURCE: Consumer sentiment survey of 2,420 respondents in March 2021, Accenture. Results are based on the survey questions "Q. Out of the activities you use fixed home broadband for, which are the most important? Please select your top 5 activities."; "Q. How many hours a week do you spend on each of these activities?"; "Q. How many hours a week did you spend on each of these activities prior to COVID-19?" and "Q. What do you value most about this online activity? - (1) Doing this activity online saves me time or money or (2) The activity is enjoyable or adds value to my life".
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Remote work has emboldened Australians to adopt flexible lifestyles during the COVID-19 pandemic

With the arrival of physically distancing – the necessary practice to help stop the spread of COVID-19 – came dramatic and rapid changes to the way Australians live and work. An estimated 4.6 million households were reliant on the nbn™ network to work from home during the pandemic and 45% of all nbn users who upgraded their plan cited remote work as a key reason.

In the span of a few months, half of Australian workers began working from home. However, despite this sudden change, eight in ten (85%) people who worked from home during the COVID-19 pandemic said the experience positively impacted how they view their work/life flexibility; with 81% stating that being connected is now more important than ever to achieve their ideal work approach.

Access to fast and reliable broadband also helped provide a sense of certainty and job security to those who needed it. 81% of people who worked from home said that fast broadband helped make them feel more secure in their jobs during the COVID-19 crisis.

Gavin Williams, Chief Development Officer, Regional & Remote at NBN Co, said:

“COVID-19 has been an incredibly challenging time for everyone, but it has also been a catalyst for positive change in many areas. With more activities shifting online, it is now possible for Australians to convert this recent experience into lasting changes that support their lifestyle goals. Supported by a high-speed, and reliable network, people are now considering how they can move home without giving up their job, access to important services or connection with family and friends.”



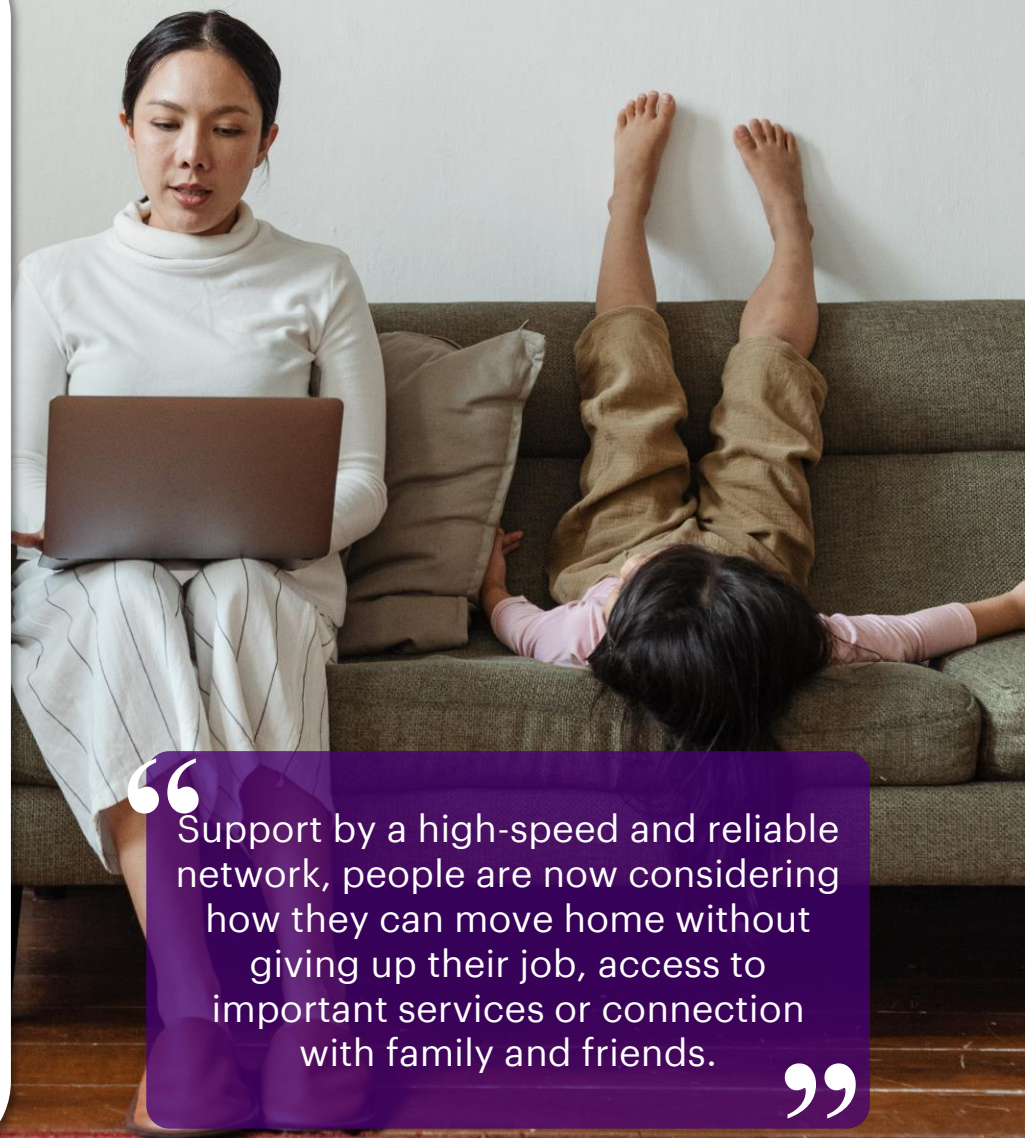
4.6m

households were
reliant on the nbn™
network to work from
home during the
COVID-19 pandemic



45%

of nbn™ powered
plan upgrades were
to better support
working from home



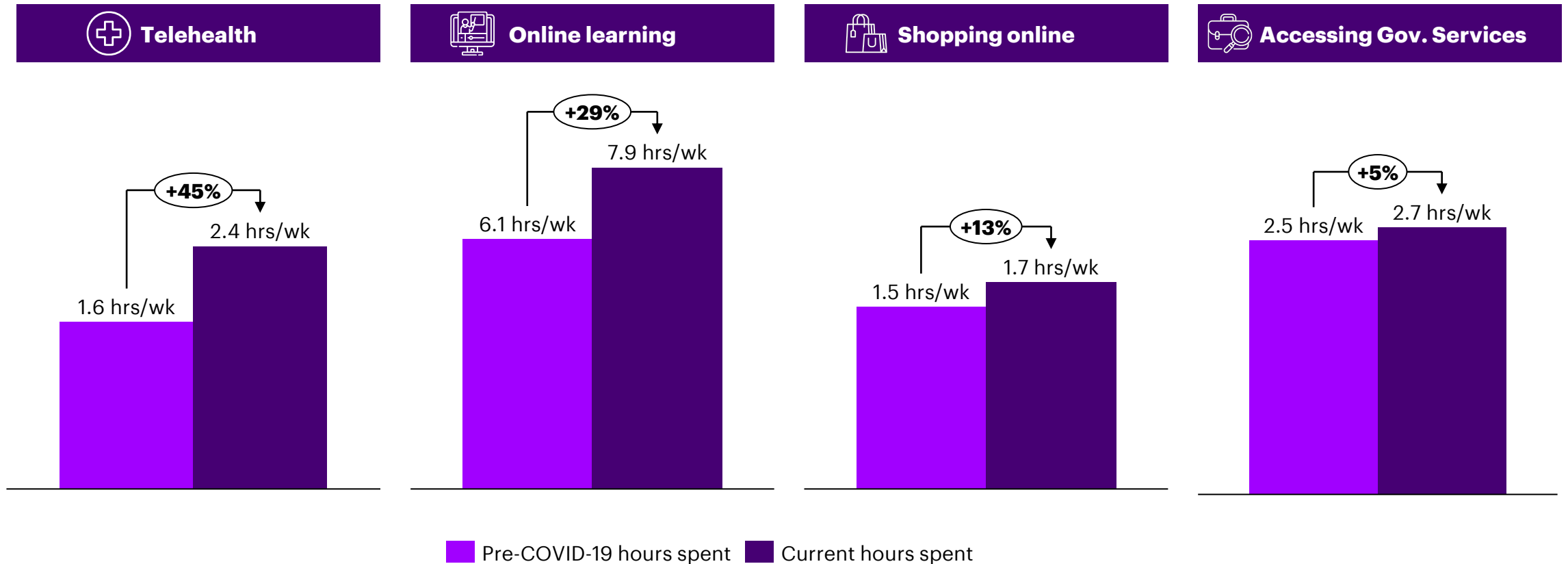
“Support by a high-speed and reliable network, people are now considering how they can move home without giving up their job, access to important services or connection with family and friends.”

”

COVID-19 amplified the use of the nbn™ network for essential activities such as telehealth, online learning, online shopping and online government services

Physical distancing requirements accelerated the adoption of digital alternatives

Time spent on online activities by nbn users before and after the COVID-19 pandemic



The nbn™ network supported students to be connected and engaged during COVID-19

During COVID-19, the **nbn™** network powered online and remote learning activities across the country. 61% of surveyed **nbn** users reported they were reliant on the **nbn™** network for formal learning and users engaged in online learning reported a 29% increase in time spent online for learning during the pandemic.

During the COVID-19 pandemic, NBN Co provided up to \$50 million to assist phone and internet providers to support low-income family households with school-aged children who do not currently have an active **nbn™** powered plan at home. This funding was intended to enable phone and internet providers to create more affordable offers to connect eligible families during term two of school in 2020.

According to a study by Connecting Australia, customers in areas with access to the **nbn™** network are more likely to use the internet for online learning than those yet to connect. Australians in **nbn™** connected areas are also more likely to dedicate at least one hour a day to learning online: one in three engage in learning such as consuming tutorial videos, finishing new courses and studying new languages, compared to one in five non-**nbn™** connected people¹.



61%

Of nbn users were reliant on the nbn™ network for formal learning during COVID-19



29%

increase

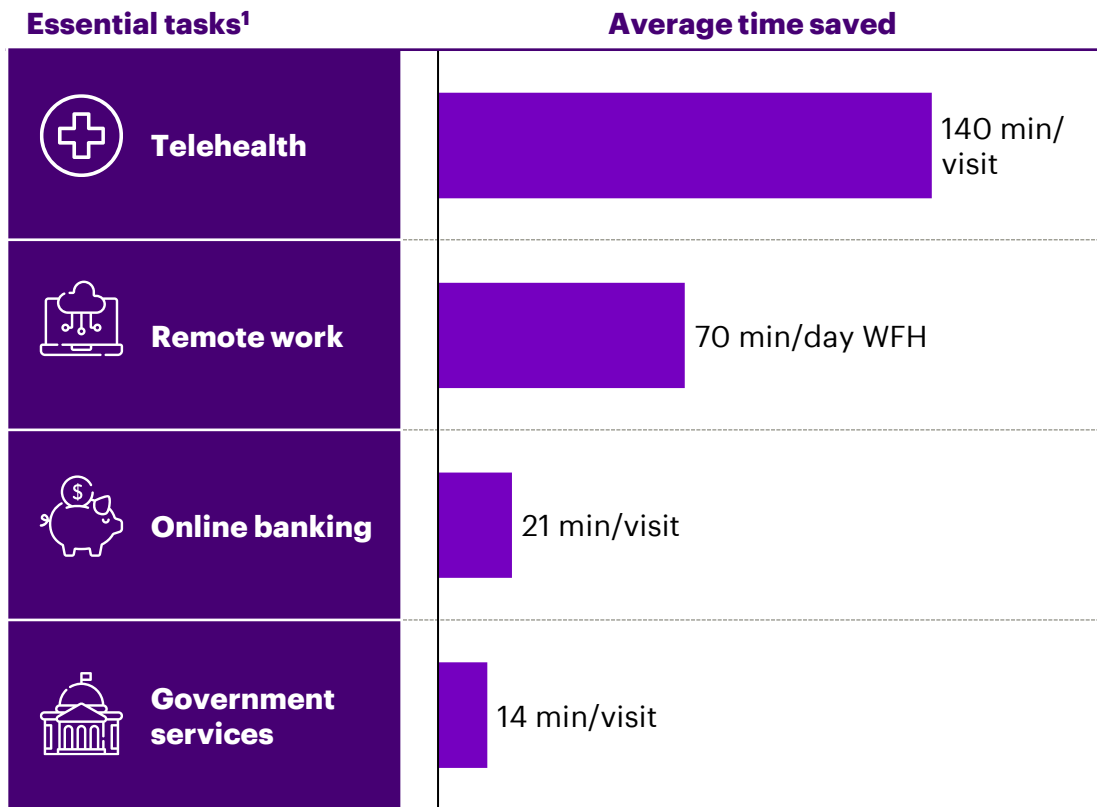
Average time spent on formal learning has increased from 6.1 to 7.9 hours a week



The average nbn user reports they save 169 hours a year by completing essential tasks over the nbn™ network

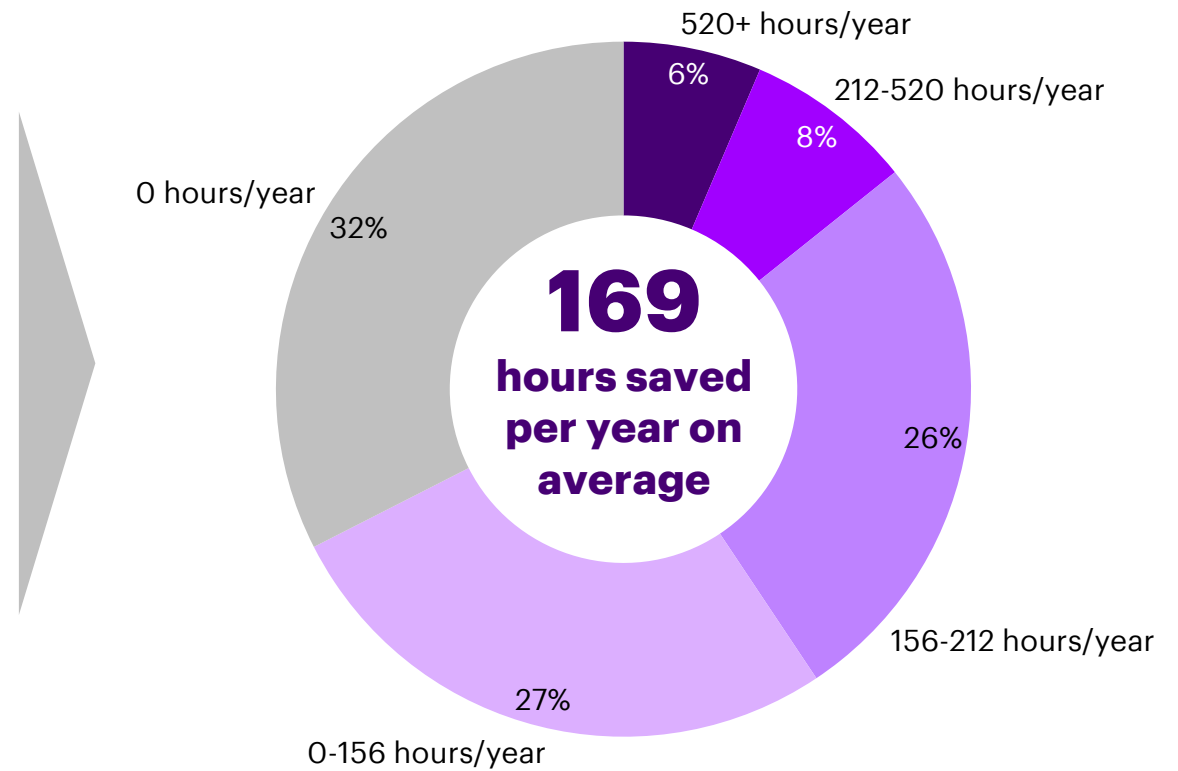
Key time saving tasks include telehealth and remote work

Minutes saved per task, minutes per instance



The average nbn user saves 169 hours a year

Respondents that save time by amount of time saved, %



Remote work and telehealth are the two biggest time-savers for nbn users



Time savings example 1: Working remotely

Time saving activity	Description	Hours saved per day WFH
 Travel time	Australians save 50 minutes a day on their daily commute when they work from home	50 minutes per day
 Productivity boost	People save 20 minutes a day due to increased productivity when they work from home ¹	20 minutes per day
Total time savings	Australians save 70 minutes per day when they work from home	70 minutes per day



Assuming 2 days a week are worked at home, Australian would save **\$1.2k a year** based off the cost of leisure time (\$9.8/hr)²

Additional cost savings could include³:

- Transport costs: **~\$2k/year**
- Lunch & coffee costs: **~\$2.2k/year**
- Work clothes & grooming: **~\$900/year**



Time savings example 2: Specialist telehealth appointment

Time saving activity	Description	Hours saved per visit
 Travel time	Australians save 2 hours per visit on specialist telehealth consultations when compared to face-to-face appointment	120 minutes per visit
 Queue time	Patients save 20 minutes per visit from not having to wait to see the doctor in the clinic	20 minutes per visit
Total time savings	Australians save 2.3 hours per visit when compared to face-to-face consultations	140 minutes or 2.3 hours per visit

2.3 hours per visit equates to a cost saving of **\$23 per visit** based off the cost of leisure time (\$9.8/hr)

Additional cost savings could include:

- Saving on petrol: **~\$30/trip**
- Cost of missing work: **~\$290/day**
- Cost of babysitting: **~\$30p/hr**

SOURCE: National Bureau of Economic Research; ING Direct; Institute of Transport & Logistics Studies at the University of Sydney Business School; Australian Institute of Health and Welfare - Elective surgery waiting times 2017-18; Australian hospital statistics; Dullet, Navjit W. et al (2017); Russo, McCool and Davies (2016); Accenture analysis

NOTE: 1. People are estimated to increase work productivity by 4.6% when they work from home due to increased network effects, better work environments and more effective IT systems (National Bureau of Economic Research, 2021); 2. Beck & Hensher's (2021) found that the average Australian worker preferred to work from home 2.2 days a week.; 3. An ING survey of n=1000 respondents suggests that the average Australian spends \$110 a week on work-related expenses;

CASE STUDY - TELEHEALTH³

Specialist care was only a 10-minute video call away for Charlotte, a mother of two in rural Victoria

When Charlotte went to her local GP with some unusual symptoms 18 months ago, she was quickly referred to a specialist three-and-a-half hours from her hometown in Victoria's Rainbow.

"Eighteen months ago, I had a lot of pain in my breast, so I was sent for an ultrasound. And they found I had cysts," says Charlotte.

Dr Ruth Bollard in Ballarat first met with Charlotte for an initial examination but decided that follow-up consultations could be conducted via video conferencing³ with Charlotte's local GP.

Soon, seven hours turned into 10 minutes!

"Fast Internet connection is vital for telehealth consults and the **nbn**TM network is obviously the tool we need," says Dr Bollard

Charlotte says the video sessions were "as good as being with Dr Bollard", and with her GP and specialist in the one virtual space, they were able to create a treatment plan and next steps.

"The benefits for Charlotte is that she can live in a community she wishes to live in and the community can be made bigger and better with specialist healthcare coming to her" says Dr Bollard³.



1 in 5

Australians used telehealth services during the COVID-19 pandemic



45%

increase
Average time spent on telehealth services has increased from 1.6 to 2.4 hours a week

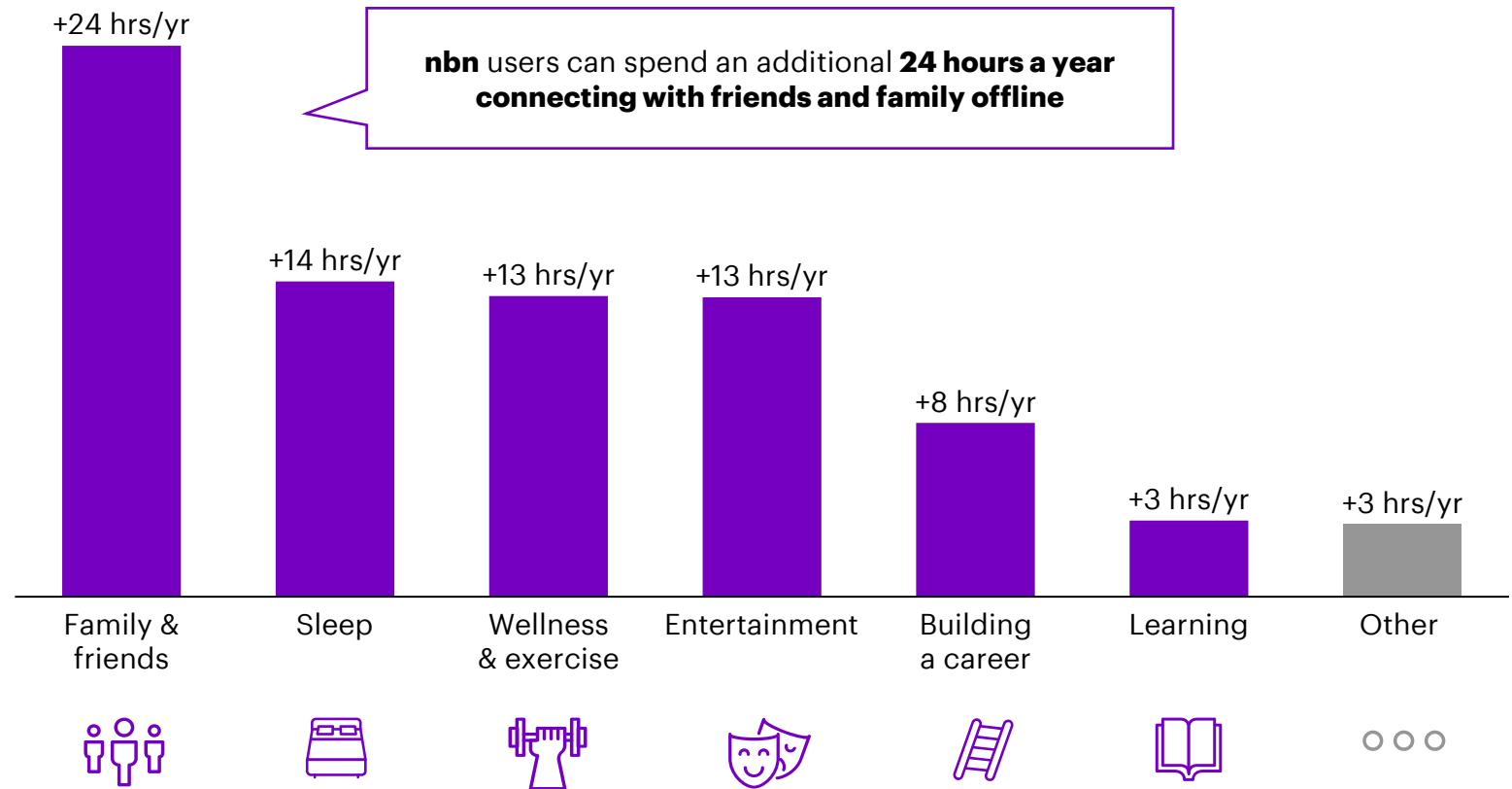
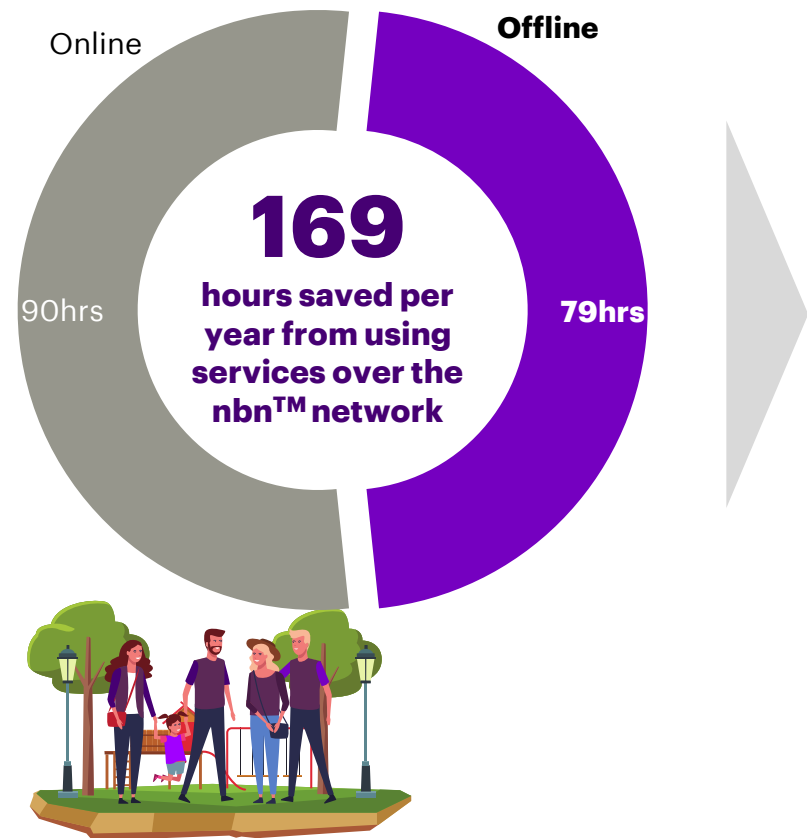
Of the 169 hours per year saved by nbn users, 79 hours are spent on offline activities; with people choosing to spend the most time connecting with family and friends offline

'Saved' time is spent offline and online

Average time saved; split by how time is spent

Additional time spent on activities due to time savings from using services on the nbn™ network

Average time spent on offline activities from hours saved from using services over the nbn™ network



Essential tasks



Enriching activities



01 The value of the **nbn™** network

02 The **nbn™** network is essential

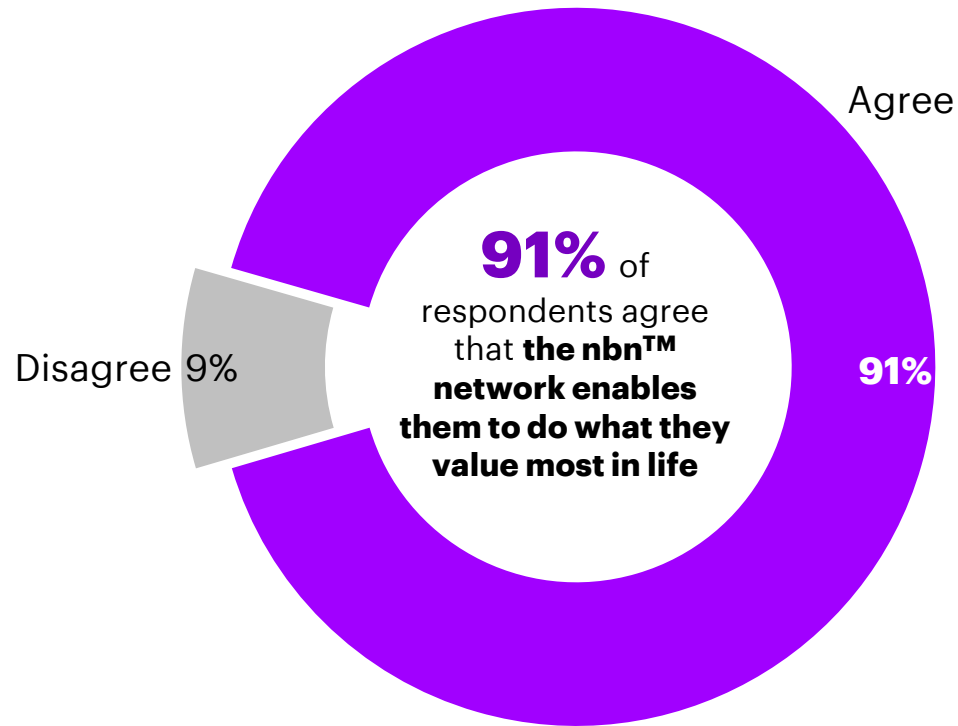
03 The **nbn™** network enriches



The nbn™ network enriches lives; 91% of surveyed users report the network enables them to do what they value most in life






The nbn™ network enables people to do what they value most in life

% of respondents



What do nbn users value most in life?

% of respondents

Life goals	Importance (% of respondents ^{1,2})
 Connecting with family & friends	60%
 Building a career	19%
 Travel & Adventure	12%
 Religion & Spirituality	5%
 Self Development and Learning	5%



NOTE: 1. Numbers might not sum exactly to 100% due to rounding. 2. Respondents that chose "Other" have been excluded; only 120 respondents (5%) chose "Other".

SOURCE: Consumer sentiment survey of 2,420 respondents in March 2021, Accenture; Results are based on the survey questions 'Q. Of the following goals, which is the most important to your life?' and 'Q. To what extent does the NBN enable you to spend time doing the thing you value the most? Consider time spent doing activities on the NBN/internet and the time savings it provides.'

Australians turn to the nbn™ network for activities that provide enrichment and enjoyment; spending up to 2 hours a day on entertainment activities

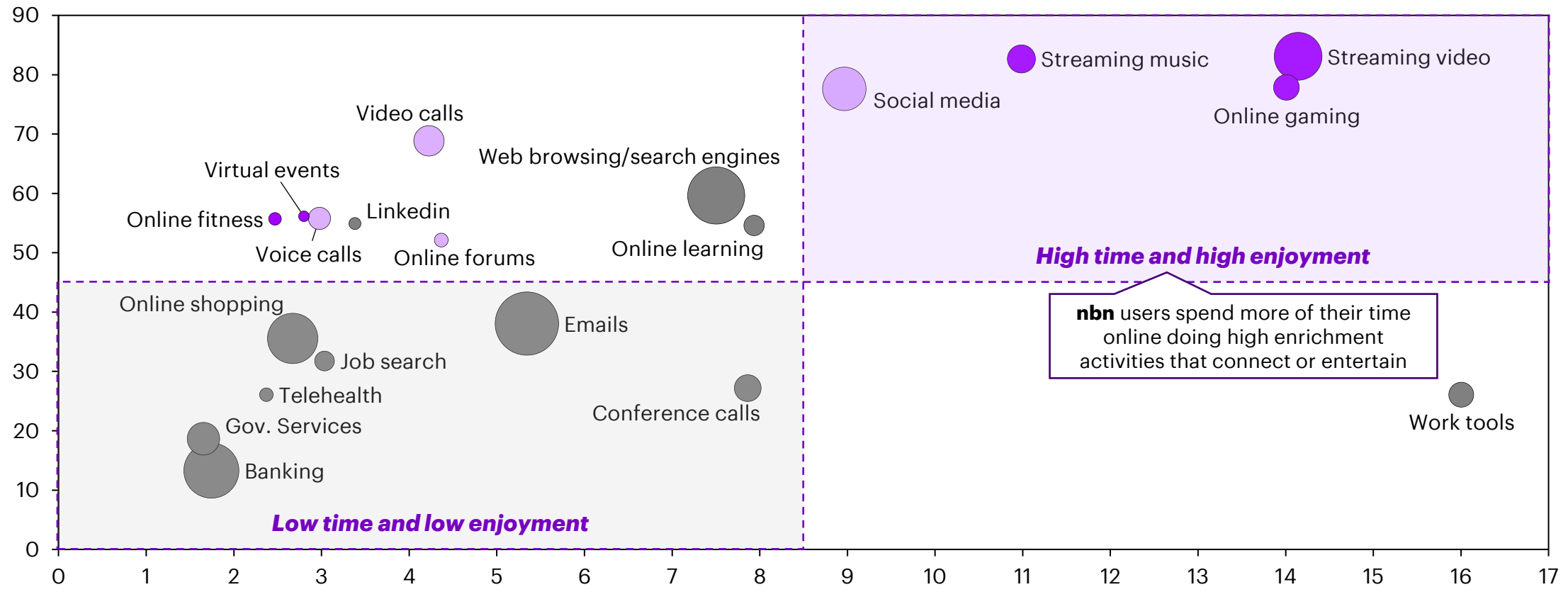
nbn users spend more time on activities they find enjoyable such as online streaming videos, music, gaming and using social media

Share of users that enjoy the activity (%); average time spent every week on the activity (hours)

● Essentials ● Social ● Entertainment

% of nbn users that enjoy the activity¹

○ 1 million Bubble Size = No. of nbn user households that consider the activity in their top 5 most important

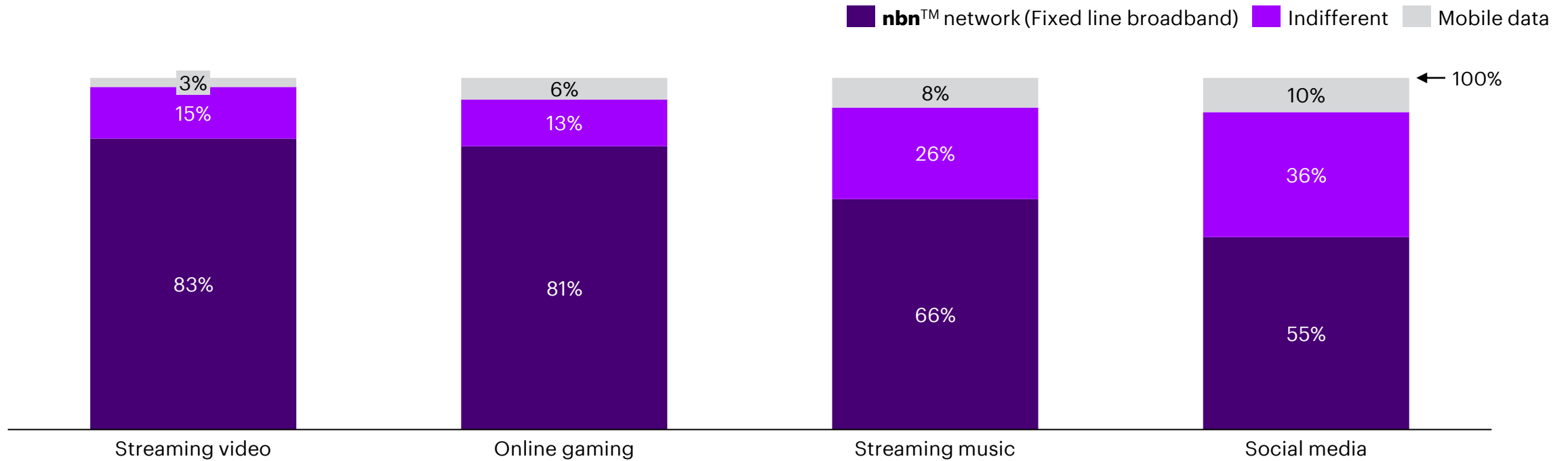


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The majority of nbn users prefer accessing online entertainment over the nbn™ network compared to using mobile data alternatives

Preferred form of internet used for highly enjoyable activities

% of respondents¹



The **nbn™** network is highly preferred for activities that have high data and speed requirements such as streaming video and online gaming

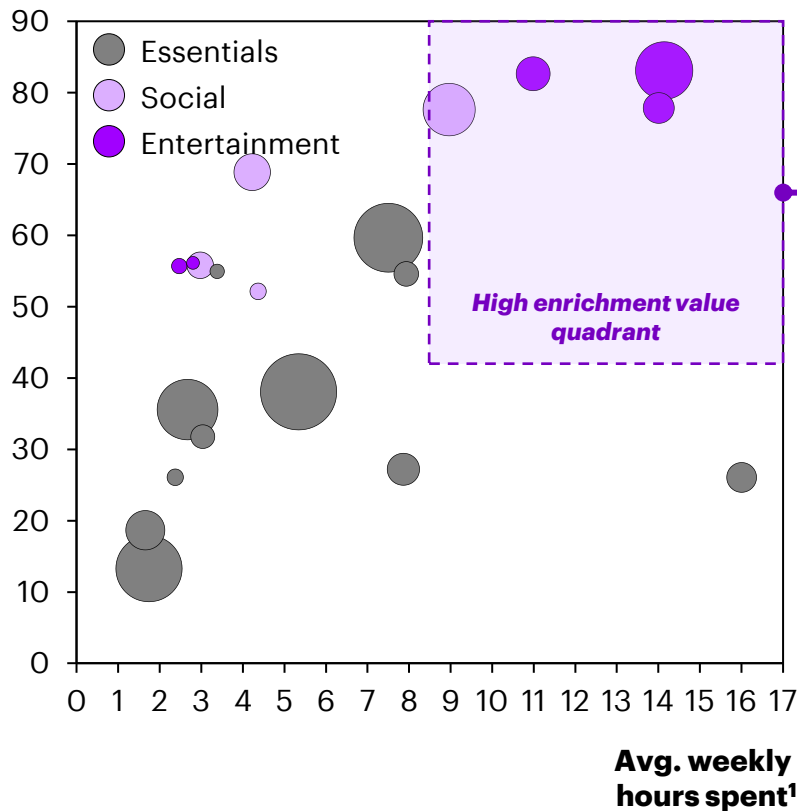
The **nbn™** network is weakly preferred for activities that are accessed on the go such as streaming music and social media. These activities are less data intensive.

Online entertainment has been particularly important in helping people relax during COVID-19

Online activities by enjoyment and time spent

% Users that enjoy the activity; Avg. hours spent/week

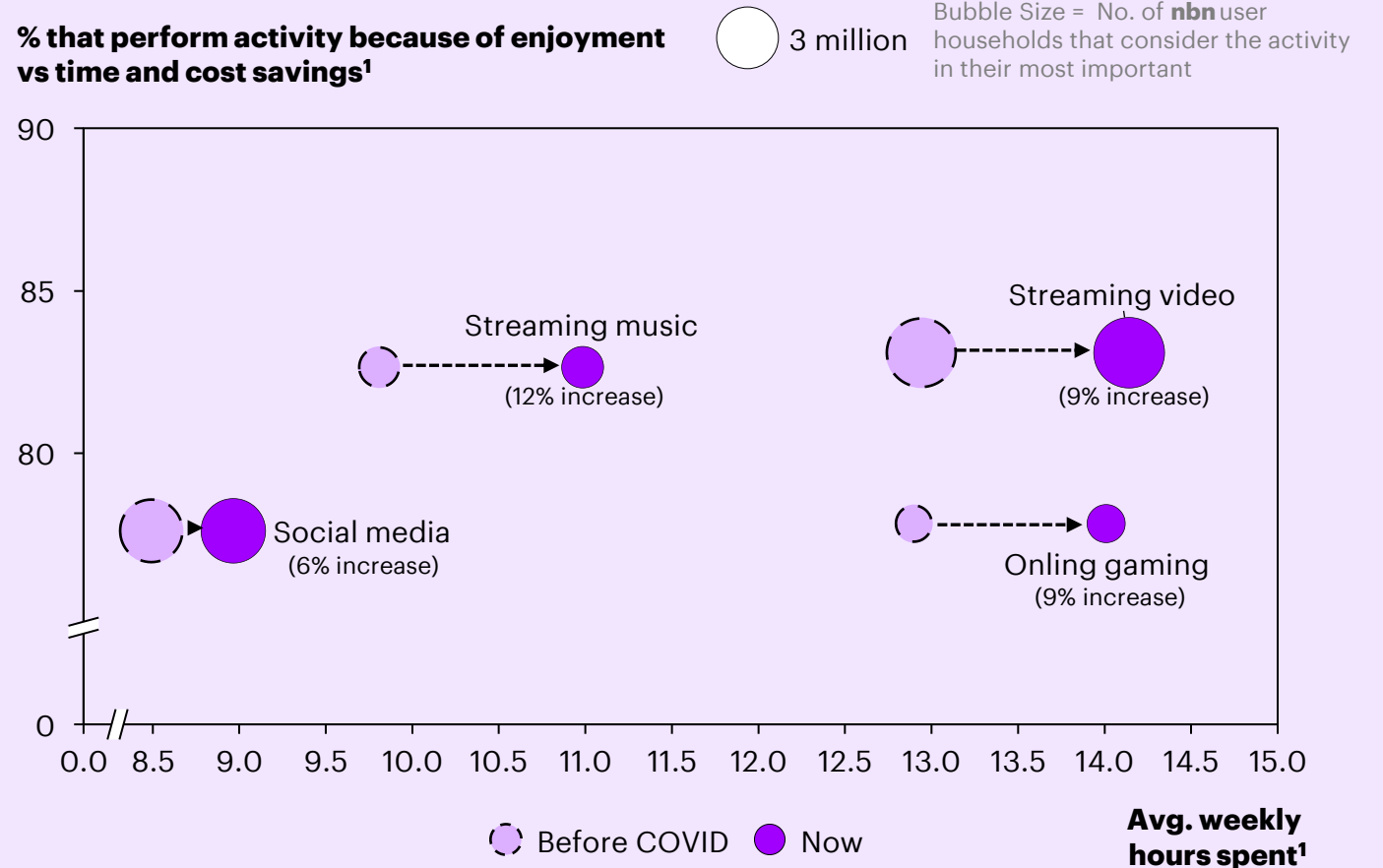
% that perform activity because of enjoyment vs time and cost savings¹



COVID-19 has led many nbn users to spend more time accessing online entertainment

Share of users that enjoy the activity (%); average time spent every week on the activity (hours)

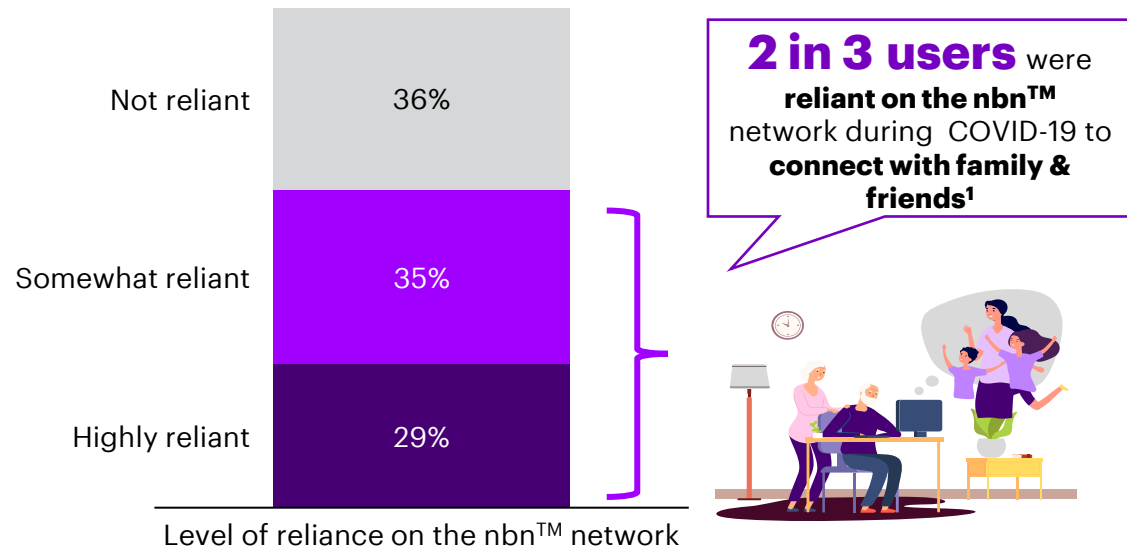
% that perform activity because of enjoyment vs time and cost savings¹



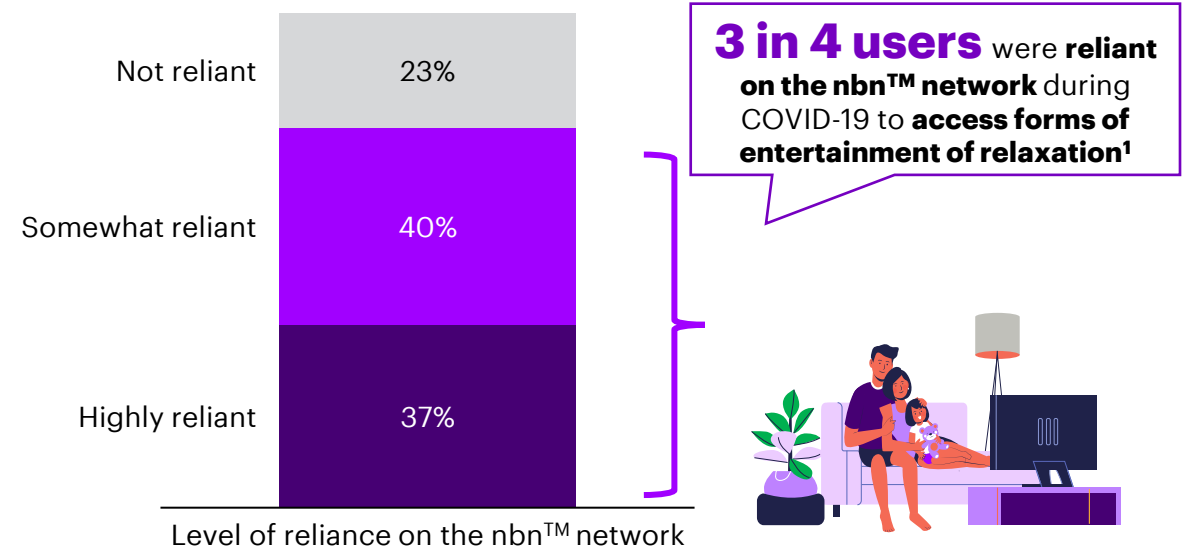
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The nbn™ network has been important for connecting users with loved ones and supporting access to entertainment during COVID-19; with 450k households upgrading their plan to support this

64% of users were reliant on the nbn™ network to connect with family & friends during COVID; 37% of plan upgrades made were to support this



77% of users were reliant on the nbn™ network for entertainment and relaxation during COVID; 23% of plan upgrades made were to support this



~450,000 households

upgraded their nbn™ powered plan during COVID-19 to better support staying connected with family & friends or to access forms of online entertainment¹

Australians are increasing deriving value from online gaming which provides enjoyment, community and unique experiences

The **nbn™** network continues to support Australians online gaming experience with 1 in 7 **nbn** users considering online gaming as their most important online activity. These gamers using services over the **nbn™** network spend ~14 hours a week on average playing online games. Average minutes spent streaming games are expected to increase by over 50% per annum to 2028.

Online gaming is not only a source of entertainment but also helps in connecting people. Research from Interactive Games & Entertainment Association (IGEA)¹, shows that in Australia -

- **43% of parents play online games with their children;** the primary reason parents cite for gaming with their children is to connect with them.
- **25% of adult gamers play with their partners online**
- **More than 1 in 4 of players share videos of their gameplay online**

During COVID-19 gamers increased the time they spent gaming on the **nbn™** by more than an hour per week (from 13 hours to 14 hours on average). It is expected that this growth will continue; minutes spent streaming games online is forecasted to grow by more than 50% per annum to 2028².



1 in 7

nbn users rank online gaming in their top five online activities



14 hrs/week

Gamers using services over the **nbn™** network spend up to 14 hours online a week



~150k

households upgraded their **nbn™** powered plan to better support online gaming during COVID-19³

NOTE: 1. Digital Australia 2020 'Power of Games' (DA20) – IGEA. 2; Bureau of Communications and Arts Research – Demand for fixed-line broadband in Australia 2018-2028. SOURCES: Consumer sentiment survey of 2,420 respondents in March 2021, Accenture; Results are based on the survey questions 'How many hours a week do you spend on each of these activities?', 'Q. Did you upgrade your plan during COVID-19?', 'Q. What was the main reason you upgraded?' and 'Q. For each of the activities you find enjoyable, or which add value to your life, what about the activity makes it important?' 3. As at the time of the survey, March 2021.



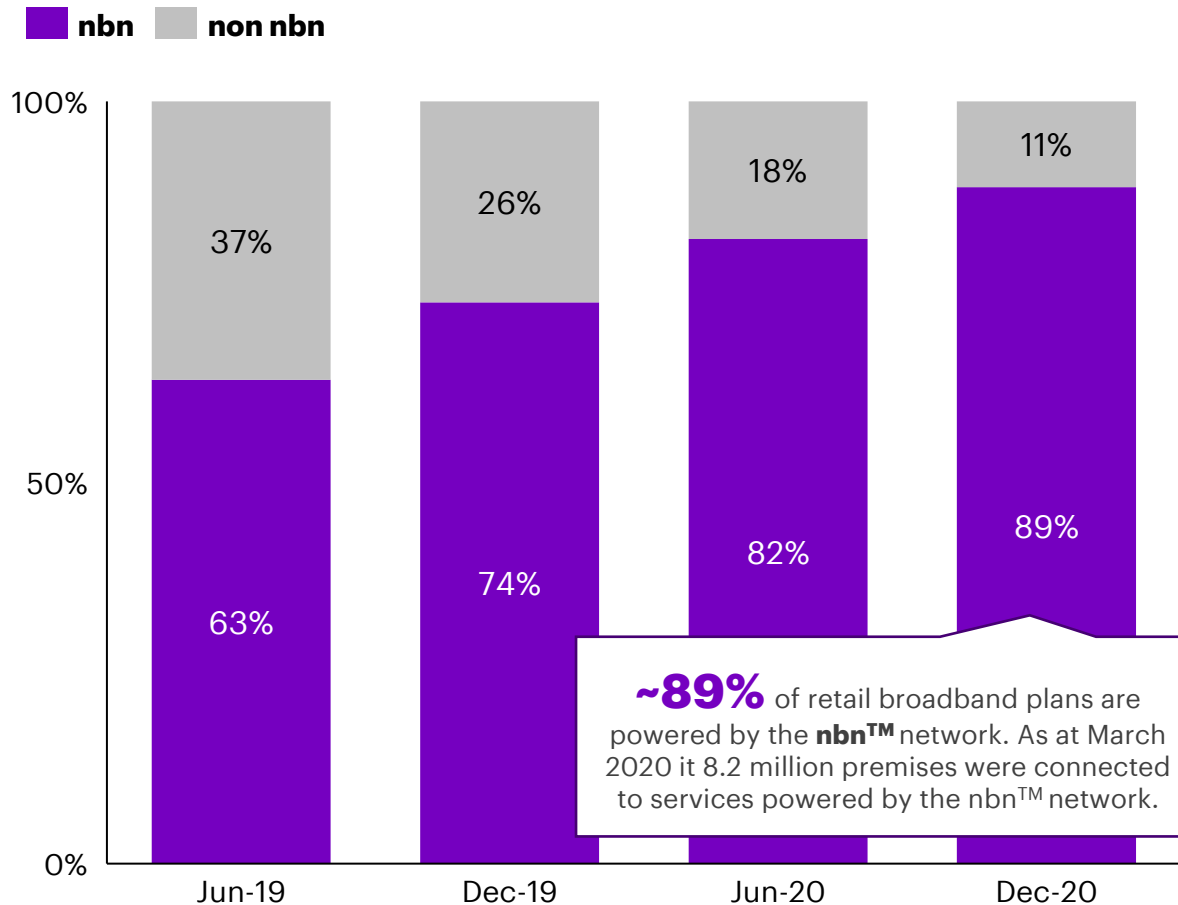


Appendix

Methodology, data sources
and assumptions

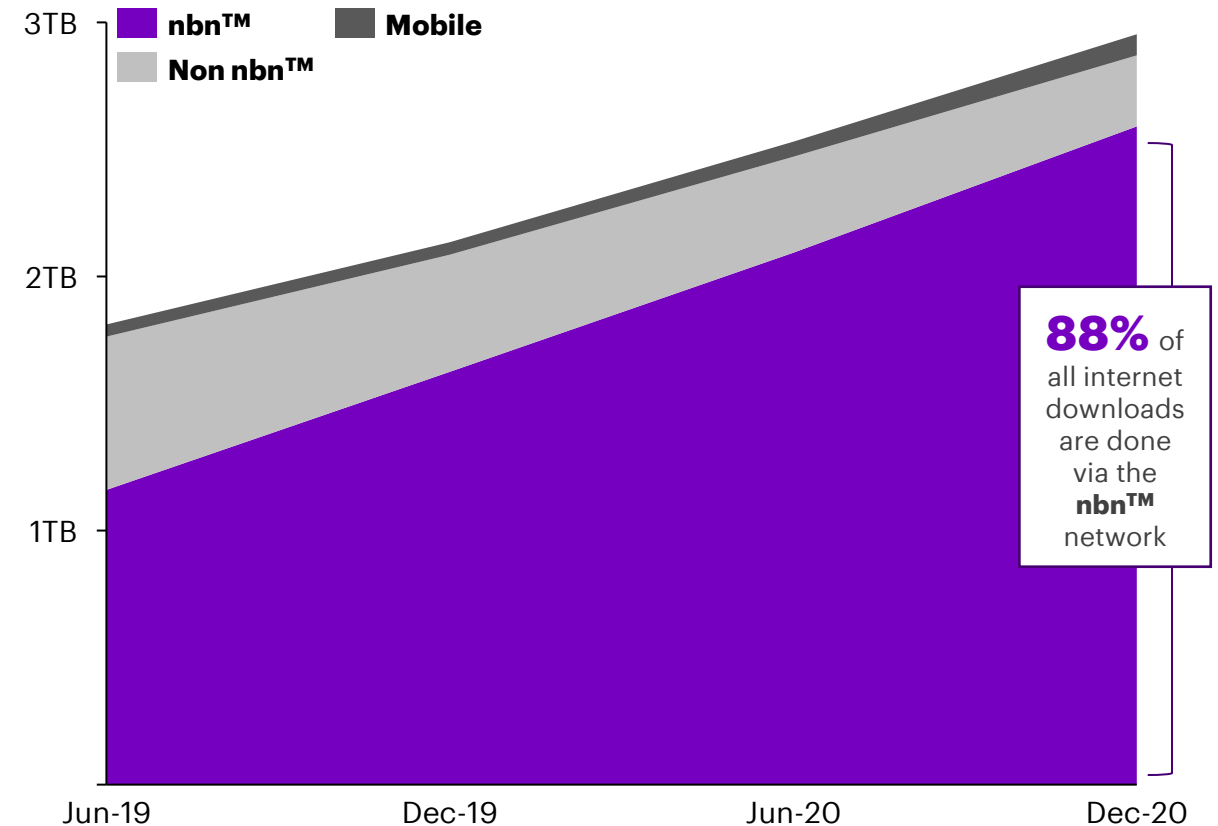
The nbn™ network is the main way Australians connect to the internet at home

89% of all home broadband plans are powered by the nbn™ network



88% of all retail data downloads are done via the nbn™ network

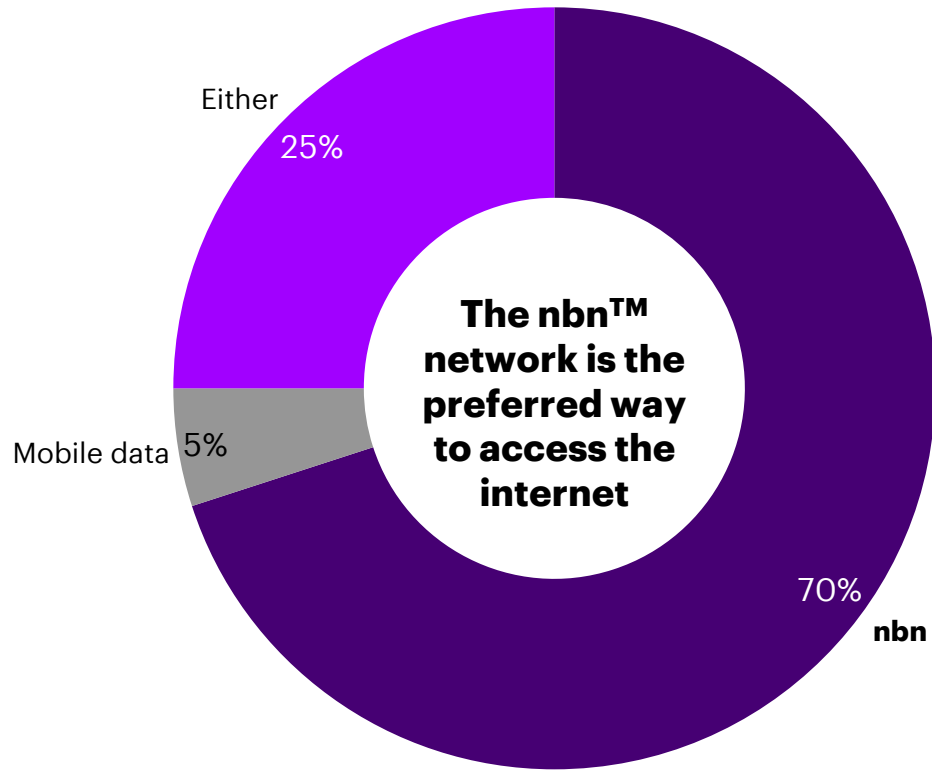
Average monthly data downloads by internet connection type¹, Terabytes



Australians surveyed prefer to connect to the internet at home via the nbn™ network rather than mobile alternatives

Only 5% of nbn users prefer to access the internet by mobile data

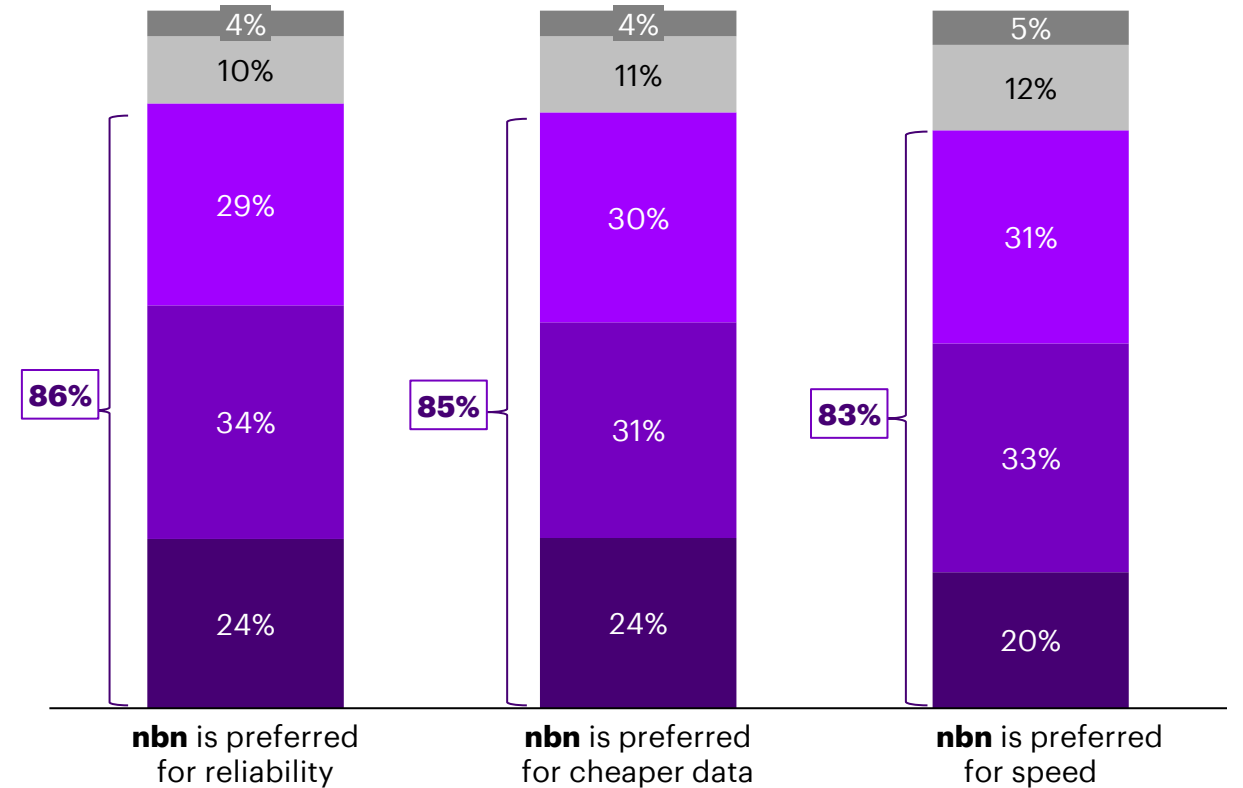
% of respondents



The nbn™ network is the preferred for reliability, affordable data and speed compared to mobile data

% of respondents

Strongly Disagree Disagree Somewhat Agree Agree Strongly Agree



Methodology: Data sources used for this report



DCE Survey

Source:

Discrete Choice Experiment (DCE) survey

Information:

- Consumer surplus derived from the **nbn™** network by nbn users
- Sample size: 1120 users
- Date: March 2021

Detailed methodology described on next slide



NBN Co

Source:

NBN Co

Information:

- **nbn™** network usage information (data downloads)
- **nbn™** activations over time



Accenture Survey

Source:

Survey of **nbn** users

Information:

- Importance and time spent on online activities conducted on the **nbn™** network
- Time saved from using services over the **nbn™** network
- Reliance on key online activities during COVID-19
- Preference of using services over the **nbn™** network relative to other internet alternatives
- Sample size: 2420 users
- Date: March 2021



Secondary research

Source:

Public data sources and reports

Information:

- **nbn** case studies:
 - Flexible living
 - Remote work
 - Telehealth
- Australian digital gaming
- Time savings from online activities
- Economic benefits of choice and optionality

Methodology: Estimating consumer willingness to pay

Methodology for measuring consumer willingness-to-pay for the nbn™ powered plans

Accenture conducted an online Discrete Choice Experiment (DCE), where **nbn** users were surveyed and asked to choose between different internet plans at different price points. Consumers' sensitivity to different attributes (e.g. price, speed, data & brand) can then be modelled.

- Respondents were asked to choose between three new hypothetical internet plans or bundles, and their current internet plan. Each plan was described by ten features – contract length, download speed, upload speed, price, data cap, peak/off peak limits and four bundle inclusions (home phone, pay tv, mobile and Wi-Fi modem)
- A latent class model ('LCM'), a variant of the multinomial logit model, was used to analyse the results of the study. A LCM allows for preference heterogeneity (i.e. different respondents can have different preferences for internet features), which is handled via a discrete distribution. These discrete distributions are referred to as 'classes'. A LCM model with two classes was chosen for consistency with prior 2014 and 2017 studies.

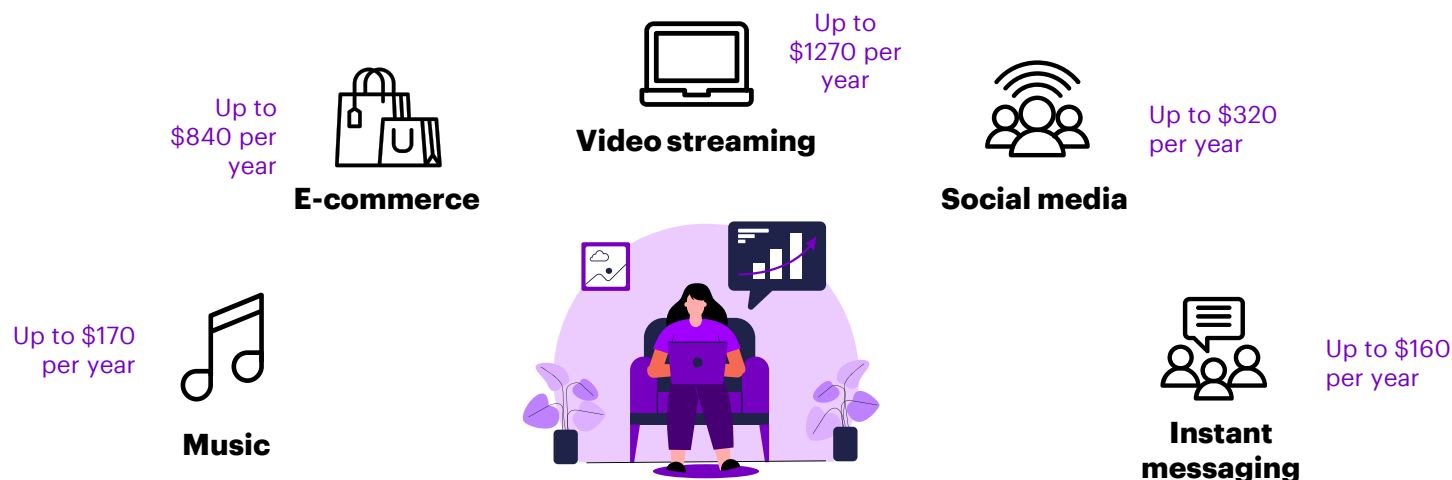
The experiment was conducted by CaPPRe which included the same personnel as a 2014 Independent Cost-Benefit Analysis using a similar method, and a subsequent study commissioned by NBN Co in 2017.

Willingness to pay is the preferred method of measuring consumer value for free or low-cost digital products because it can capture the intangible, non-monetary value of goods

Specifically, willingness to pay is preferred under three instances:

- **When the knowledge or entertainment gained from a good or service far exceeds the cost a consumer pays for it:** For instance, Wikipedia and Facebook provide a wealth of entertainment and knowledge for free
- **When value generated is not captured through official GDP or productivity statistics:** For example, the convenience consumers receive when they are able to browse an array of products on e-commerce platforms for free
- **When the provision of goods or services has a zero or near zero marginal cost of delivery:** For example, near zero marginal costs of smartphone app and website visits mean that valuable services can be provided for free

Consumers derive immense value from free or low-cost digital services...



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