NBN Futures Group
Discussion Paper
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Extending the Social and Economic Benefits of Australia's Broadband Networks: Action in the time of COVID-19

NBN Futures Group

The NBN Futures Group is an independent group of experienced telecommunications industry professionals and researchers who have been considering issues in the future development of the NBN and broadband networks generally since February 2019, largely through a series of forums hosted by TelSoc and articles in the *Journal of Telecommunications and the Digital Economy*. (See Attachment 2)

At a time when it is not possible to conduct physical forums, the group is exploring ways, such as through papers like this one, to promote discussion and consideration of key issues. As a discussion starter, the paper does not seek to be totally comprehensive or to examine all aspects in depth: rather, it is intended to act as a stimulus for further thought and discussion. Comments are invited of any nature and may be directed to the principal author, John Burke, jpburke@fastmail.com.au .

1. Introduction

This paper argues that the full achievement of the social and economic benefits of national broadband networks in Australia requires the establishment of a national coordinating body for the long term, notionally titled here as a Broadband Institute. In the short term the benefits of applications development and digital inclusion are being observed in the COVID-19 crisis and could be further supported by a body denoted as the Broadband Capability Task Force, as a precursor to the Institute. The paper emphasises the importance of taking a demand-side or user-focused perspective, suggests desirable characteristics of the Task Force and Institute, and introduces considerations in their establishment.

The paper has been written in a time of unexpected and rapid change. The first construct of the Broadband Institute was developed in the NBN Futures Group well before COVID-19 emerged, but the crisis has dramatically changed perspective on substantive elements of the paper so that earlier thinking has had to be made relevant to this occurrence - and indeed readied for further changes as practices during the crisis are observed.

As a specific instance, since the early drafts of this paper NBN Co has announced a major initiative in providing $150m for a COVID-19 Relief Fund to assist access and affordability needs of low-income families and small businesses. This should go a significant way to achieving some of the objectives proposed for the Task Force in the short term and could provide a base for pursuing the other objectives.[1]

2. Background

There is a long-standing global view that a national broadband network has considerable social and economic benefits. This is a view given strong emphasis in recent statements of the Minister Paul Fletcher and Shadow Minister Michelle Rowland. In looking to the future development of the NBN, and broadband networks more generally, the means for fully realising these potential benefits need to be addressed.

The current experience of COVID-19 has, however, significantly changed perceptions of these benefits. For many, broadband networks – fixed and mobile - have enabled working at home, studying and communicating in various forms. Many innovative instances of "living online" are revealed each day, at the same time as there are major social innovations such as broad-based telehealth, to which there have been long-standing barriers.

On the other hand, many people are excluded from participation in these benefits through a combination of lack of technical access, affordability of services, and relevant skills. The need for action on this critical issue has been emphasised by the Australian Communications Consumer Action network (ACCAN) and other organisations in a recent submission to government.[2]

Broadly, broadband networks are coming to be seen as delivering essential services, with the infrastructure as a utility in the same way as those of water, electricity and gas – though differing in the myriad of applications that the digital society and economy provide.

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[1] https://www.nbnco.com.au/corporate-information/media-centre/media-statements/nbn-co-creates-covid-19-relief-and-assistance-package
[2] https://accan.org.au/our-work/1713-community-sector-organisations-call-on-government-to-act-on-communications-affordability-issues

This is a time when there is a heightened opportunity to further develop creative approaches to the use of the broadband infrastructure and, most importantly, to deal directly with the requirements for digital inclusion. It is a time when we can seek to respond to immediate needs while putting in place structures for the future.

This paper does not seek to detail all the ways in which government and industry action might be taken to assist this two-pronged approach of ensuring digital inclusion and furthering the development of creative applications. Rather, it proposes the immediate establishment of a Broadband Capability Task Force to address both these issues and the ways of evolving towards a longer term, more comprehensive agency, denoted here as a Broadband Institute. Difficult as these times are, this systematic approach may be a constructive response to meeting the nation's needs for broadband-enabled solutions.

As well as suggesting objectives for the Task Force and a later Institute, this paper outlines some of the considerations that provide context for these proposals and may be picked up in detail by these bodies.

3. Shifting perspective to a demand-side focus

We firstly need to recognise a necessary modification in policy focus. For a considerable period, debate about national broadband network development in Australia has focused on the technical and ownership aspects of the relevant infrastructure. The social and economic benefits of this infrastructure are, however, derived from the ways in which it is put to use by a wide variety of users - residential, small business, corporates, government agencies and other service providers. This user focus, or demand-side perspective, requires a quite different orientation than that of the supply-side perspective on technology and services. Globally, research is identifying that, once the infrastructure is substantially in place, nations are increasingly starting to take a demand-side focus on policy development:

> "Theoretical research and international experiences have demonstrated that, while both supply-side and demand-side policies have a positive effect on broadband diffusion at the initial stage of broadband adoption, only demand-side policies appear to generate a positive and increasing effect after one has reached a certain degree of broadband penetration."[3]

In this vein, in statements to the NBN Futures Forum in July 2019, Minister Fletcher emphasised the need to "get the maximum social and economic impact from the $51B taxpayer's money" and to understand "how best to leverage this extraordinary national investment". Shadow Minister Rowland identified "the task of public policy will be to maximise the benefit of that investment [in the NBN] now and into the future".[4]

This user-focused perspective brings in components of social, economic and policy research and development on which we have had relatively little emphasis in our national policy debate.

4. Concept Proposals: Broadband Capability Task Force and Broadband Institute

This paper proposes the immediate establishment of a Broadband Capability Task Force to support responses to the situation arising from the COVID-19 response; and later, say in the next two years, a more developed Broadband Institute to harness these initiatives and expand the examination of

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[3] http://aisel.aisnet.org/cais/vol39/iss1/10 , p177-178 and 183
[4] https://telsoc.org/journal/jtde-v7-n3/a202

further aspects of broadband use in Australia. There will be other highly relevant views as to how these entities should best operate, so they are presented here as initial concepts for consideration.

While they are presented as conceptually new entities, there is a recognition throughout the paper of the range of organisations with active relevant interests. It may be determined that these organisations are channels for particular activities, or that the proposed entities be in some way more directly related to one or more of these organisations.

4.1 Broadband Capability Task Force (working title)

Objectives
- To ensure the greatest possible capacity of citizens to engage in the Digital Society and the Digital Economy, specifically promoting the general ability of our citizens to:
    o Use visual communications (such as Zoom, Skype, Facetime and other forms);
    o Access government services, specifically, and essential services generally;
    o Access web information; and
    o Use various digital tools, including email and messaging apps.
- To assist the extension of creative approaches to utilising broadband services.
- To identify the barriers to implementation of these proposals and actions and seek to resolve them.
- To propose a path for evolving into a longer-term Broadband Institute.

Form:
A mixed membership of government, industry, community and academic representatives as appropriate.

Funded by government, with specific commitments to operational funding and substantial project funding.

Immediate activities would include
1. Fast-tracked examination of proposals for digital inclusion, leading to development and implementation of a short-term strategy, including specific support to those excluded, such as for:
   - Laptop or smart phone availability;
   - Affordable quality Internet access: e.g. "ACCAN proposes a 50 mbps unlimited broadband service offered at a wholesale price of $20 per month by NBN Co to households receiving government financial support. This would mean eligible households would pay approximately **$30 per month for unlimited broadband** – almost halving the current average cost."[5];
   - Development of digital skills, via smart phone or other devices;
taking into account the range of experience that exists in this area, through Digital Hubs and other resources, and the availability of digitally capable people currently unemployed or underemployed.

2. Mapping the range of socially and economically valuable applications in existence or emerging – e.g., in health, education, business and communication activities and identifying those which could be encouraged through promotion, skills development or other support.

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[5] http://accan.org.au/No-Australian-Left-Offline

4.2 Broadband Institute (working title)[6]

The major intention of the Institute would be to drive understanding and development of social and economic benefits of broadband networks.

Objectives:
The Institute would have specific objectives such as the following:
- To continue the activities of the Broadband Capability Task Force (inter alia) as an incubator and promoter of practical policy proposals and actions in the areas of applications development and building digital capability;
- To identify the barriers to implementation of applications and digital capability activities and seek to resolve these;
- To undertake research into user needs, applications development and economics as appropriate;
- To maintain a database of research, statistics and applications developments;
- To build an active network of researchers, industry members and other stakeholders;
- To investigate international approaches which may provide guidance.
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Key functions:
- Programs for:
  - Scaling up of applications: identification of needs, analysis of barriers, promotion of possibilities
  - Digital inclusion; identification of problem areas and groups and feasible approaches, supporting projects to an appropriate scale
- Policy development
- Social research
- Economics research
- Maintenance of statistical data

Form:

To be supported by government, industry and academia in a structure to be determined.

Whether this body would be separate from, but supported by, government, or more closely linked in an Agency-type structure requires consideration. For example, could the Digital Transformation Agency(DTA) be expanded to accommodate additional functions? The DTA should be closely involved with this new Institute, given the importance of government services in applications development and digital capability.

Given the range of other organisations with interests identified in this paper, it may be that the Institute concept is best rendered in a network form linking these and identifying and supporting gaps. For example, the Australian Digital Inclusion Alliance already brings together a range of organisations in network form to pursue digital inclusion projects and policy advocacy.

Both the Task Force and the Institute should be established with bipartisan support.

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[6] In initial reviews of this paper various other suggestions were made including Digital Society Institute and Broadband Australia Council. These are suggestions to consider further if the broad concept of a core focus is supported and functions and form become clearer

5. Responding to the current context

All the dimensions of broadband applications in this current time are not yet clear, requiring a more comprehensive and consolidated focus as suggested through the Broadband Capability Task Force, but some can be discerned. We are seeing a rapid shift of activities into an online context, with the associated questions of: How effectively is this happening and can it be supported?, What does it suggest about future possible developments? and Who needs assistance to be able to participate in these activities?

In tertiary education, online learning approaches have existed for more than twenty years. But now we see the major shift of primary and secondary schools to online learning; with associated support structures for students including provision of laptops and Internet access[7], with skill building support also needed. Anecdotally, many teachers are challenged to adopt this medium and in other systems such as TAFE, both students and teachers are challenged without necessarily the same support.

Versions of telehealth through online telephone and consulting have existed in *Hospital in the Home* programs and in remote, regional and outer metropolitan areas for some time[8]. But broader access to such approaches have had the barrier of recognition under Medicare – a barrier which has suddenly been swept aside, leaving questions about the capability of medical professionals and the general public to utilise these services. Now that this recognition of remote support has been established, what kind of extensions could valuably be added? For example, CSIRO ran some years ago a trial of home monitoring devices which they considered was of significant benefit.[9] What levels of home monitoring could now be utilised with the support of higher-level broadband services? Have "Factors that influence the implementation of e-health"[10] been identified, which have as much to do with social systems and individual competencies as they do with technology characteristics, and been addressed?[11]

The Digital Transformation Agency provides a strategic structure for government service development with a strong user focus in its design of services.[12] However, questions remain: how well are members of the public able to access these services at this time?; what support do they need?; and how can this be provided?

Other government agencies are recognising the necessity to support clients who are now dependent on online approaches. For example, during the COVID-19 period, the National Disability Insurance Agency is allowing funding in NDIS plans to be used flexibly to purchase low-cost assistive technologies in recognition that people with disability may have to access services online, including through telehealth.[13] Clearly there are also broader issues about the capability of people with a disability to

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[7] https://www.jamesmerlino.com.au/media-releases/victorian-students-to-learn-from-home-as-vce-timelines-revised/

[8] https://www2.health.vic.gov.au/hospitals-and-health-services/patient-care/acute-care/hospital-in-the-home, p9, and
https://view.officeapps.live.com/op/view.aspx?src=http%3A%2F%2Fwww.mbsonline.gov.au%2Finternet%2Fmbsonline%2Fpublishing.nsf%2FContent%2FBD043EFC05A981EFCA257CD20004A3A3%2F%24File%2FTelehealth%2520Program%2520Guidelines%2520effective%25201%2520July%25202012.docx

[9] https://www.csiro.au/en/Research/BF/Areas/Digital-health/Delivering-care-remotely/Home-monitoring

[10] https://www.researchgate.net/publication/309444908_Factors_that_influence_the_implementation_of_e-health_A_systematic_review_of_systematic_reviews_an_update

[11] It is noted that the Australian Digital Health Agency has this application under consideration. See the National Digital Health Strategy (https://conversation.digitalhealth.gov.au/sites/default/files/adha-strategy-doc-2ndaug_0_1.pdf), p40.

[12] https://www.dta.gov.au/digital-transformation-strategy

[13] https://www.ndis.gov.au/coronavirus/participants-coronavirus-covid-19/using-your-budget, Q1

engage with the agency in these times, and to engage with service providers to meet their needs. Where is the knowledge base for the agency to access to develop appropriate policies?

In the community, there is a flourishing of online approaches from music festivals to new social groups, and video-based community and family gatherings. How is this flourishing able to be supported? Who is excluded from these activities, and how can they be best assisted?

Businesses are seeking new ways of operating in the online world and needing to support employees working from home. Core organisations such as the Australian Information Industries Association provide support structures for this transition, but are these well enough known and sufficient?

There are commonalities in utilising online possibilities across these various sectors, for which cross-fertilisation would be valuable. Also, there will be commonalities across the cohorts of people experiencing difficulties with being included in these service developments – for which a coordinated and thoroughgoing approach to the issues of digital inclusion would be appropriate.

The COVID-19 crisis provides a kind of giant experimental laboratory for online applications in which there are matters to be captured about take-up, issues experienced and outcomes. Access issues are becoming apparent in online learning and telehealth in remote and rural areas. Research interests in these matters are already being identified, and projects being contracted. A Broadband Capability Task Force could further support and synthesise these research activities.

Another set of questions will arise as we emerge from this initial period of handling COVID-19 and building this online capability; in regard to the continuity of these applications, the ways to utilise this enhanced capability and the balance that will be developed with life in the physical world. We may well find that perspectives developed prior to this event are no longer relevant with the heightened interest and experience that will exist .

6. The role of NBN Co

What could or should be the role of NBN Co in these developments?

The 2016 Statement of Expectations states an overall aim as:
> "The National Broadband Network ('the network') aims to foster productivity and provide a platform for innovation in order to deliver economic and social benefits for all Australians."[14]

NBN Co states in its 2020 – 2023 Corporate Plan:
> "By providing access to fast, reliable and affordable broadband services, NBN Co is helping Australian homes and businesses realise the social and economic benefits that high-speed broadband can unlock.
>
> NBN Co's purpose is to lift the digital capability of Australia."[15]

The Plan then devotes a section to Digital Capability – interpreted largely as infrastructure presence rather than a user-focused concept of access, affordability and skills to engage in and develop applications - and a section on Social and Economic Benefits. This latter section reports the results of

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[14] https://www.communications.gov.au/publications/nbnstatementofexpectations
[15] https://www.nbnco.com.au/content/dam/nbnco2/2019/documents/media-centre/corporate-plan-report-2020-2023.pdf, p3

research by AlphaBeta on the impacts of the NBN, here focusing on the elements of: Contribution to the economy; Helping Australia stay connected to family and friends; Supporting greater female workforce participation; Children engaging in online learning; and Commitment to underserved areas.[16]

The appearance of this material in the NBN's Corporate Plan is a significant recognition of the overarching aim in the Statement of Expectations, though the material provided does not yet reflect a substantial strategic or operational attempt to achieve these aims, beyond the major task of building infrastructure and conducting this preliminary research. This situation may mirror the kind of initial emphasis on technology-side approaches to infrastructure referred to on page 2, with the subsequent desirable emphasis on demand-side not yet having fully emerged.

It may be that the proposals made in this paper are really proposals for NBN Co to consider in relation to its declared aims. However, in the absence of existing strategies and operational plans, it seems desirable to stand back and consider how these aims might be best achieved. This consideration should recognise that we now clearly understand that broadband networks in Australia are both fixed line and mobile, so societal interests in social and economic benefits extend beyond the fixed line services for which the NBN is responsible – suggesting that a broader perspective is desirable, albeit with strong NBN involvement.

While this thinking might lead us to a separate Institute, different conclusions might emerge in the short term for the Broadband Capability Task Force. Clearly it would be within NBN Co's stated aims and the Statement of Expectations for NBN Co to take a major role in initiating such activity.

As noted in the Introduction, this perspective was developed before NBN Co's significant announcement of its $150m COVID-19-Relief Fund which, subject to knowing more details about implementation, must go a long way towards achieving the short-term access and affordability objectives proposed for the Task Force. It demonstrates NBN Co's ability to act in this space. The initiative and the consulting arrangements around it - with government, ACCAN and industry - could form a base for the broader Task Force activity.

7. Relevant considerations`

As a basis for discussion and further development, a number of key considerations are identified and briefly sketched in this section and a range of active stakeholders identified.

7.1 What constitutes the social and economic benefits of a broadband network?

The key dimensions of social and economic benefits might be identified as:
- Macro views of contribution to the economy
- Expansion of Internet use in a broad range of information, communication, transaction and entertainment applications
- Specific socially valued application areas: such as government services, education, health, banking.
- Specific economic development areas: such as business (corporate and SMEs), agriculture, tourism.
- Broader social impacts, such as decentralisation
- Possible benefits of future application areas: such as Internet of Things, augmented reality.

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[16] https://www.nbnco.com.au/content/dam/nbnco2/2019/documents/media-centre/corporate-plan-report-2020-2023.pdf, pp 27-39

7.2 Maintaining a discourse

There have been claims about the social and economic benefits of broadband networks over the years, but little apparent sustained, cohesive discourse or research in Australia. Contributions over the last decade or so have included:

- Paul Fletcher raised the questions of "Why our broadband infrastructure matters? What is the prize?" in his book *Wired Brown Land* in 2009, devoting a chapter to examining a range of dimensions similar to the above, noting the hype about benefits but concluding that there is ample evidence to show them.[17]
- From 2009 to 2019 the Institute for a Broadband-Enabled Society and its successor the Networked Society Institute conducted a range of public seminars and forums.
- In 2010 in an article in The Australian Economic Review, Trevor Barr argued that "Issues about possible applications and services for the new broadband network, and the related consumer behaviour demand factors, were largely ignored or relegated to secondary policy consideration" and that "There are overriding public interest issues about access, affordability and serving special citizen needs that ought to be part of a national public policy broadband applications and services framework".[18]
- In 2012 the 'Broadband and Society' research team at University of Canberra Faculty of Arts and Design, which no longer exists as such, hosted a symposium, *Converging on an NBN Future: Content, Connectivity, and Control.[19]*
- In 2012, IBM commissioned IbisWorld to produce the report 'A Snapshot of Australia's Digital Future to 2020', authored by Phil Ruthven, which emphasised the importance of high speed broadband as the nation's new utility to support all industry sectors, examining 509 classes of industry to determine whether the impact on each of these would be Transformational Benefit, . Significant Benefit, Generalised Benefit or Warning of Likely Demise.[20]
- Australian Centre for Broadband Innovation, with CSIRO *Broadband impact and challenges: realising the benefits from the digital economy* (2013) [21]
- Sora Park's book, *Digital Capital*, encapsulates a considerable amount of Australian and international user-focused research.[22]
- The 2018 Regional Telecommunications Review, *Getting it right out there*, addressed Economic Benefits, Social Benefits and Digital Inclusion and Digital Literacy.[23]
- The Joint Standing Committee on the National Broadband Network in its report, *The rollout of the National Broadband Network,* took a variety of evidence which led to the conclusion that:

    "8.61 The rollout of the NBN presents many economic, health and business opportunities to residents in regional, rural and remote Australia. The committee received evidence of very positive developments occurring in regional areas, including: businesses leveraging the

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[17] Fletcher, P, 2009. *Wired Brown Land*, University of New South Wales Press Ltd, Sydney, Australia.

[18] Barr, T, 2010. "A Broadband Services Typology", The Australian Economic Review, vol. 43, no.2, pp.187-93.

[19] https://www.canberra.edu.au/research/faculty-research-centres/nmrc/research/converging-on-an-nbn-future

[20] https://www-03.ibm.com/press/au/en/presskit/38032.wss

[21] https://publications.csiro.au/rpr/download?pid=csiro:EP1312215&dsid=DS1

[22] Park, S, 2017. *Digital Capital*, Palgrave Macmillan.

[23] https://www.communications.gov.au/publications/2018-regional-telecommunications-review-getting-it-right-out-there

> capabilities of the NBN; innovation in agriculture; improved educational opportunities for distance education students; and initiatives to expand the provision of health services."[24]

- More recently, Paul Fletcher, as Minister, has been reflecting on aspects of social and economic benefits, such as in a recent CEDA speech.[25]

Many of these contributions are dependent on individual case studies showing the value of broadband in particular circumstances, rather than being able to illustrate the scale of implementation through authoritative data.

7.3 Does Australia have a driving focus on achieving social and economic benefits?

If we look back to early considerations of a national broadband network from the early 1990s, we see a sequence of government generated activities including the Broadband Services Expert Group and later the National Office for the Information Economy. More recently the focus of government activities has been on internal government approaches, resulting in the Digital Transformation Agency with its responsibility for government services, specific application areas such as the Australian Digital Health Agency, and a limited policy focus within the Department of Infrastructure, Transport, Regional Development and Communications.

The Department of Industry's 2018 *Australia's Tech Future: Delivering a strong, safe and inclusive economy*[26] is the latest strategic statement about the government's intentions in regard to the digital economy. It proposes a Vision "That Australians enjoy an enhanced quality of life and share in the opportunities of a growing, globally competitive modern economy, enabled by technology". It canvasses areas of benefits by identifying and providing examples of activities in application areas - business, government services, health, education – and in the need for skills for employment and the broader issue of digital inclusion.

However, its statement of what the government will do:
- ensure education and training meets current and future needs, to help businesses take advantage of digital opportunities and leave no Australian behind
- facilitate investment in enabling digital infrastructure
- improve access to, and use of, data while maintaining strong data safeguards
- ensure legacy frameworks are flexible, adaptable and fit for purpose
- deliver digital government services are secure, fast and easy to use
- champion open, free and secure cyberspace internationally

does not indicate a strong applications implementation focus as envisaged for the Broadband Institute, although it may entail an approach to digital inclusion.

Further elaboration of the statement "The implementation of *Australia's Tech Future* will include monitoring how Australia is tracking against our stated objectives and outcomes to identify where to further focus efforts." may clarify objectives and intended outcomes and indicate where responsibility for functions might lie within or outside government.

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https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Broadband_Network/NBN/First_report

25 https://www.paulfletcher.com.au/portfolio-speeches/speech-to-cedas-40th-state-of-the-nation-the-nbn-and-productivity

26 https://www.industry.gov.au/data-and-publications/australias-tech-future

In November 2019 the Digital Technology Taskforce was established in the Department of Prime Minister and Cabinet with departmental representatives and an external Advisory Committee, with a remit to mid-2021 covering issues including:[27]

- changes in the digital technology landscape
- impact and uptake of digital technology in broader economic factors (jobs, wages, sectors)
- infrastructure supporting the use of digital technology
- digital skills and inclusion
- support for businesses to adopt digital technologies
- opportunities to grow digital trade
- empowering and protecting consumers
- supporting digital technology related ideas
- online safety and the evolving nature of societal interactions, and
- ways to deliver as whole-of-government.

It may be that this Taskforce will result in some of the activities suggested in this paper. On the information currently available, though, it appears there is no entity with the task of driving, encouraging or monitoring the realisation of social and economic benefits on a whole-of-society and whole-of-economy, structured basis.

7.4 International approaches

In contrast, countries with advanced broadband infrastructure, such as South Korea and China, have long established plans and central agencies.

South Korea's National Information Society Agency (NIA), created over 30 years ago:
- formulates national strategies "to open the way to future intelligent society"
- develops mid-to long-term ICT strategy and National ICT master plan
- includes organisational components Policy and Planning, e-Government, Healthcare and Welfare, Education and Culture, Digital Inclusion
- collects and publishes annual Information Society statistics[28]

China has a strong supply-side emphasis in its Broadband Plan, but also demand-side, with:
- a primary consideration of "Serving for national economy and social development"
- a 2020 goal of "Broadband applications deeply incorporated into people's lives and work"
- a Task to "increase the level of broadband network applications" with projects:
    - SME broadband application demonstration
    - Broadband application for poor schools and special education institutions
    - Digital culture broadband application demonstration
- other guidance to a wide range of applications
- regular data capture and monitoring by the China Internet Network Information Center[29]

Other perspectives on international approaches, and Australia's relativity to them, come from such vehicles as:

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[27] https://www.pmc.gov.au/domestic-policy/digital-technology-taskforce/scope-digital-technology-taskforce

[28] eng.kc.go.kr, https://www.canberra.edu.au/about-uc/faculties/arts-design/attachments2/pdf/nbn-symposium/BB_KimPark12Final.pdf

[29] http://aisel.aisnet.org/cais/vol39/iss1/10, https://www.unescap.org/sites/default/files/Broadband%20China%20Strategy.pdf,http://www.gov.cn/zwgk/2013-08/14/content_2466856.htm, https://cnnic.com.cn/IDR/ReportDownloads/201911/P020191112539794960687.pdf

- The OECD's *Going Digital* policy framework, and its associated *Measuring the Digital Transformation: A Roadmap for the Future*, which has some demand-side perspectives in the seven dimensions of Access, Use, Innovation, Jobs, Society, Trust, Market Openness.[30]
- The UN E-Government Development Index which ranks Australia second behind Denmark. This Index is based on three sub-indices - the scope and quality of online services as indicated by the Online Service Index (OSI), the status of the development of telecommunication infrastructure rated through the Telecommunication Infrastructure Index (TII) and the inherent human capital scored through the Human Capital Index (HCI). The TII and HCI look a bit light (set up to accommodate development of 193 countries), with the requirement for broadband being 128kbps. However, the OSI covers a good range of government services – including provision of information and ability to carry out a range of activities.[31]
- The International Inclusive Internet Index done by the *Economist*, which ranks Australia 14, based on categories of Availability, Affordability, Relevance, Readiness.[32]
- The US National Digital Inclusion Alliance as an advocate for, and supporter of, digital inclusion programs.[33]

7.5 Academic and related research

Academic and related research and development with a focus on use has had a chequered history since the 1990s. Relevant organisations that no longer exist include: CIRCIT (Centre for International Research on Communication and Information Technologies); the Smart Internet CRC, later Smart Services CRC; and, more recently:

- the Institute for a Broadband-Enabled Society, established in 2009 through support by the Victorian Government to "support research and development on broadband applications and services"; and later the Networked Society Institute (closed 2019) with an emphasis on collaborative research around the Internet[34]; and
- the Australian Centre for Broadband Innovation, established by CSIRO and the National ICT Australia Ltd (NICTA), with initial funding from the NSW government, sought "to create innovative broadband-enabled services, demonstrate their use in real world situations and evaluate their potential commercial and social value", closed in 2014.

CSIRO's Data61 was formed in 2016 from the integration of CSIRO's Digital Productivity flagship and NICTA, focusing on applied R&D across a wide range of industries.[35] A relevant current example of their activities is their emphasis on telehealth in the COVID-19 context.[36]

Further examination of the experience of these latter initiatives may lead to clarification of the Institute concept having a possibly greater emphasis on user perspectives, inclusion, policy and scaling up initiatives rather than developing innovative applications itself. This might also shape a complementary, or other form of, relationship with Data61.

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[30] http://www.oecd.org/going-digital/

[31] https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2018-Survey/E-Government%20Survey%202018_FINAL%20for%20web.pdf. Methodology detail in Chapter 5 and Annex A.5 of https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2018-Survey/E-Government%20Survey%202018_FINAL%20for%20web.pdf

[32] https://theinclusiveinternet.eiu.com/, methodology at https://theinclusiveinternet.eiu.com/methodology.

[33] https://www.digitalinclusion.org/

[34] https://networkedsociety.unimelb.edu.au/archived-pages/ibes and https://networkedsociety.unimelb.edu.au/

[35] https://data61.csiro.au/en/About

[36] https://data61.csiro.au/en/Our-Research/Our-Work/Health-and-Communities/Precision-health/Coviu?featured=6EDF11D88EED4B6794F2FBDFD65766B2

While individual researchers have continued to focus on specific inclusion and user-focused aspects, broad community of interest activities appear to have declined with the Communications Policy and Research Forum which was conducted by the Network Insight Institute for a number of years ceasing in 2011[37] and the last identified general demand-side conference was that mentioned above at the University of Canberra in 2012. More specific activities include, for example. a strong thread of research activity in relation to telehealth, such as at the University of Queensland with the establishment of the Centre for Research Excellence in Telehealth, which was funded by the National Health and Medical Research Council from 2013 to 2019, and the continuing Centre for Online Health.[38]

Research projects that have recently been conducted on a contract basis include:
- the continuing development and maintenance of the Australian Digital Inclusion Index through a team of researchers at RMIT and Swinburne University, utilising survey research by Roy Morgan, supported by Telstra;[39]
- the series of Connecting Australia reports produced by consulting firm AlphaBeta for NBN Co covering impacts of digital technology on education; business; citizen engagement in health, entertainment, online transactions; and the particular experience of women.[40]
- *Digital participation: A view of Australia's online behaviours,* a survey study conducted by BehaviourWorks Australia, supported by Australia Post.[41]

The ABS's survey of *Household Use of Information Technology* – with data capture including: households with internet access; devices used; personal use of the internet; reasons for personal use of the internet; types of goods or services purchased or ordered online; accessing the internet for home based work - ceased in 2016-17.[42]

7.6 Assessment of macro-economic benefits

Many questions arise about the usefulness and validity of estimates of the economic contribution of broadband networks. At the macro level, we see estimates of contributions to GDP ranging from $30bn in Labor Party policy in 2007[43], to estimates of the order of $16bn in the 2014 Vertigan Report[44], and $10.4bn in 2021 in the current NBN Corporate Plan.[45] A Centre for Energy Efficient Telecommunication study in 2015 placed the incremental benefit of the NBN against legacy broadband services at 1.8% of GDP in 2025.[46]

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[37] https://apo.org.au/organisation/83351

[38] https://cretelehealth.centre.uq.edu.au/, https://coh.centre.uq.edu.au/,

[39] https://digitalinclusionindex.org.au/

[40] http://www.connectingaustralia.com.au/#home

[41] https://auspost.com.au/content/dam/auspost_corp/media/documents/white-paper-digital-inclusion.pdf

[42] https://www.abs.gov.au/ausstats/abs@.nsf/mf/8146.0

[43] https://parlinfo.aph.gov.au/parlInfo/download/library/partypol/E2KM6/upload_binary/e2km65.pdf;fileType= application%2Fpdf#search=%22library/partypol/E2KM6%22

[44] https://www.communications.gov.au/departmental-news/nbn-market-and-regulation-report, pp 55-56

[45] https://www.nbnco.com.au/content/dam/nbnco2/2018/documents/media-centre/corporate-plan-report-2019-2022.pdf. This assessment, by AlphaBeta on behalf of NBN Co, is based on examination of ABS data from the 2016 Census for regions 90% or more serviced by the NBN in comparison to those 10% or less serviced by the NBN through a Computable General Equilibrium model. A methodology paper is provided at https://www.alphabeta.com/wp-content/uploads/2018/04/AlphaBeta-Connecting-Australia-Project-Summary-methodology.pdf

[46] https://ceet.unimelb.edu.au/publications/ceet-economic-impact-nbn.pdf

How verifiable are these figures and what do they mean? Is $10.4 billion a substantial contribution, amounting to approximately 0.5% of GDP? If so, the case may be made that such a contribution to the economy justifies government investments in the infrastructure.

Telstra, in its recent submission to the Joint Standing Committee on the NBN noted that "nbn co has estimated these social returns grow from $1.2 billion in 2017 to $10.4 billion in 2021, which translates to a 14% to 35% return on taxpayers' investment respectively" leading to the argument that "our regulatory and policy settings seek to optimise the broader social and economic return from taxpayers' investment in nbn co, and not focus solely on improving nbn co's 3% internal rate of return. Indeed, focussing too much on nbn co's private returns will put at risk the broader social and economic returns that justify taxpayers' investment."[47]

Another interpretation of the benefits to government from such an economic impact, if accepted, might reckon on a return to government of the taxable component of this GDP increase, possibly of the order of $2.5-$3bn - still greater than possible dividends based on, say, 7% on the equity of $29.5bn, which would amount to approx. $2.1bn.

The 2018 Regional Telecommunications Review cites a number of examples of claimed sectoral contributions via digital technologies, which would derive from efficiencies from business transformations as well as direct impacts of broadband availability. These include:
- "Work undertaken by PricewaterhouseCoopers Australia (PwC), cited in the NSW Business Chamber's submission (p. 3), indicates that small businesses could potentially unlock an additional $49.2 billion of private sector output over the next ten years by making better use of digital technologies. The PwC modelling suggests that 53% of the potential economic benefit could be made by small businesses located outside Australia's inner metropolitan centres" (p21)
- "Economic modelling from the Accelerating Precision Agriculture to Decision Agriculture project (P2D) indicates that digital agriculture could increase the gross value of Australian agricultural production by $20.3 billion, a 25% increase over 2014-15 levels. The greatest gains are expected to come from automation, better tailoring of inputs such as fertiliser and seed, and environmental benefits such as water savings." (p28)
- "Researchers from the CSIRO have estimated that using telehealth technology to help the chronically ill to monitor and manage their condition at home could almost halve mortality rates and save the health budget up to $3 billion a year." (p31)[48]

A dimension requiring further work is that of the economic value of digital inclusion .

7.7 Relevant examination and development in the Australian context – digital capability/inclusion

There is a significant body of work and advocacy on digital inclusion. A 2013 *Australian Journal of Telecommunications and the Digital Economy* article by staff of Infoxchange put the view that:[49]

> "Digital inclusion is vital to employment participation, economic development, educational achievement, social and civic inclusion, health and well-being. Many people continue to be digitally excluded in Australia and, importantly, as technology changes there is a growing risk of a participation gap in terms of the person's ability to engage with technology. At present,

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47
https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Broadband_Network/smallbusinessandcase/Submissions, Submission No.9.
48 https://www.communications.gov.au/publications/2018-regional-telecommunications-review-getting-it-right-out-there
49 https://telsoc.org/journal/ajtde-v1-n1/a9

the response to such a major issue in Australia is fragmented and only occasionally addressed holistically. Comprehensive national research on the issue is limited, the longer term costs of digital inclusion have not been fully explored, nor do we have a national plan to mobilise a whole of community effort that ensures that all Australians have the skills and opportunity to benefit from digital citizenship."

The authors propose a framework for considering digital inclusion and conclude that:

"Achieving ambitious goals around digital equality will not occur (and the digital participation gap will widen) if a more targeted and holistic approach is not undertaken and this requires consideration of more innovative public and private sector partnerships that can improve both scale and impact. This requires leadership and much greater coordination perhaps under a government organisation such as Australian Communications and Media Authority"

Recent activities include:
- the monitoring by the Australian Digital Inclusion Index based on the components of Access, Affordability, and Digital Ability[50];
- skills-development programs in community including:
  - the Department of Communications' Digital Hubs program which accompanied the rollout of the NBN;
  - GoDigi, an online initiative by Infoxchange and Australia Post to support face-to-face mentoring by volunteers to a range of excluded groups [51];
  - Be Connected, a Commonwealth Government initiative managed by the Good Things Foundation, aimed at supporting the digital literacy of older Australians through a website and neighbourhood house and other community organisations;[52]
  - Digital Springboard, a program by Infoxchange and Google oriented particularly to work-related skills.[53]
- consideration of the issue within the 2018 Regional Telecommunications Review;
- advocacy by organisations including ACCAN and the Australian Digital Inclusion Alliance, and particular interest groups such as Broadband for the Bush and the Isolated Children's Parents Association.

Some representative recommendations are in Attachment 1 as indicators of guidance currently existing.

7.8 Relevant examination and development in the Australian context – applications

As noted, in the applications dimension there have been several research and development activities, apparently largely focused on the technology side of applications, which no longer exist – including the Institute for a Broadband-Enabled Society (IBES) and its successor the Networked Society Institute, and the Australian Centre for Broadband Innovation. There are now a number of organisations focused on specific areas of applications development – including Data61, the Commonwealth Government's Digital Transformation Agency, with its essentially government services remit, and in the health area the Australian Digital Health Agency, the Digital Health CRC , the CSIRO and Queensland Government's Australian Ehealth Research Centre, the Australian Centre for

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[50] https://digitalinclusionindex.org.au/
[51] https://www.godigi.org.au/
[52] https://beconnected.esafety.gov.au/
[53] https://www.digitalspringboard.org.au/

Health Innovation, the industry bodies the Australian Telehealth Society and the Australian Institute of Digital Health, and commercial developments such as Telstra Health.[54]

AARNet, as a national broadband network of a particular kind servicing tertiary and related institutions, provides many exemplars and much experience of applications development based on the availability of high-speed broadband[55].

A comprehensive mapping of the range of applications for which broadband is utilised, who are the active players, and what are the barriers and issues, is not apparently available. Such a mapping may need to differentiate what are considered to be socially valuable or "beneficial" applications, as distinct from those which are particularly commercially viable – for which streaming video and gaming may be particular candidates for examination, in comparison say to telehealth, education and other service applications.

In his 2010 article 'A Broadband Services Typology', Trevor Barr introduced the categories of
- Unmanaged services, available on the open Internet, including information search, travel, e-commerce, finance and so on.
- Managed services offered by broadband suppliers that charge rates; including movies, sport, news and current affairs.
- Publicly supported services, which may be part of managed services but may be inherently unprofitable; such as e-health, e-government and education programs.[56]

7.9 Other perspectives

This paper has been written with a focus on the "green shoots" of applications implementation and development, instances where benefits may be clearly seen and the primary questions are those of scaling, and the recognition of exclusion apparent in current times. There are other perspectives through which the social and economic benefits can be examined. How, and whether, the Broadband Institute engages with these is a matter for further consideration as a balanced approach to the concept of benefits is established. They include:
- Historical perspectives, considering their accuracy and the factors that have contributed to their realisation or otherwise. Early telecommunications industry projections include some contents of the *Telecom 2000* report of 1975, with its recognition of the future benefits of optic fibre networks, and statements such as:

    "Future telecommunications could offer substantial economic and environmental benefits as a low energy alternative to certain types of travel. Telecommunications may also find important roles in education, health and welfare services, the potential for which have scarcely being tapped. A wide range of new business uses of existing and new telecommunications services is likely to emerge and, rising above all, there is a vast potential for new telecommunications services in private homes."[57]
- Current future projections, of which there are a wide range, many reiterating those of 1975.
- Critiques and boundaries of the digital economy and society, ranging from broad views on impacts on thinking and neurological condition to specific concerns about screen-based impacts on

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[54] https://www.digitalhealth.gov.au/, https://www.digitalhealthcrc.com/, https://aehrc.com/, http://www.healthinnovation.org.au/, http://www.aths.org.au/, https://digitalhealth.org.au/, https://www.telstrahealth.com/

[55] https://www.aarnet.edu.au/case-studies

[56] Barr, T, 2010. "A Broadband Services Typology", The Australian Economic Review, vol. 43, no.2, p. 188.

[57] *Telecom 2000: An Exploration of the Long-Term Development of Telecommunications in Australia*, National Telecommunications Planning Branch, Telecom Australia, 1975, p7

students and others, and reflections during this current crisis on the importance of face-to-face activities.
- Requirements of broadband networks to support applications, which would flow from a detailed mapping of applications and possibilities.

7.10 Conceptual issues

This paper has not sought to examine underlying conceptual issues, but they are significant and will require attention to establish clarity of language and approach. A valuable reference is Sora Park's book mentioned above, *Digital Capital*, which examines constructs of
- digital capital: used to emphasise the value of investment in digital capability and engagement, rather than a gap-based concept of digital exclusion; and
- effective use: through which the question is asked "can people use digital technology effectively to achieve their goals?"

and emphasises the necessary balance between the physical world and the digital world. These ideas could become core components of an ongoing conceptual framework.

8.   Summary and Next Steps

This paper briefly outlines a range of activities directed towards achieving greater social and economic benefits of broadband networks - through government initiatives towards society-wide policy approaches, establishment of applications-oriented centres and institutes, and social and policy research in various forms - much of which has now ceased. The question arises as to why activities have ceased, and what is necessary to have a sustainable activity long-term. A further question is whether there is a vacuum to fill or whether we are achieving all the benefits we might through current processes. A full answer to this question would involve a detailed examination and mapping of the social and economic benefits achieved and an assessment of the adequacy of that achievement. A partial answer may be seen in the events in the current COVID-19 crisis, specifically:
- the recognition of significant digital inclusion issues in the establishment of the COVID-19 Relief Fund; and
- the immediate breaking down of the barrier of Medicare recognition to enable broader telehealth applications.

It has taken a crisis to fully recognise and advance these two beneficial approaches. It remains a question as to how they are to be maintained and extended in scope and timescale.

This paper outlines a two-stage process to extend the social and economic benefits of broadband networks in Australia, based on the establishment of a Broadband Capability Task Force to address immediate issues in the context of COVID-19 and the later development of a long-term Broadband Institute. The recent initiative of NBN Co in establishing the COVID-19 Relief Fund is recognised as an important step and a possible base for these developments. A brief sketch of key considerations in the development of a Broadband Institute indicates there is a range of experience potentially available to contribute to this endeavour.

Broader consideration of these issues with government, industry and community will be greatly aided by comments of any nature from other experienced people. These might cover:
- Are there additional issues to be considered so as to properly address the social and economic benefits of broadband networks? What other approaches to pursuing these benefits should be considered?
- Is the proposal for a Broadband Capability Task Force, as an agency active in the current COVID-19 situation, one to be pursued for its immediate benefits and its possible lead into the longer-

term development of a Broadband Institute? Are there other actions which should be taken into account in considering this development?

- Is there merit in the proposal for an ongoing Broadband Institute? If so, what further issues need to be considered in its development? Might an existing entity undertake its functions?
- Any suggestions that would strengthen the discussion: What needs more elaboration?

Attachment 1: Recommendations regarding Digital Inclusion

- 2018 Regional Telecommunications Review[58] recommendations about Digital Inclusion and Digital Literacy:

  Recommendation 7: The existing data limits for Sky Muster services be reviewed with the aim of increasing data limits across the board. As a minimum, the spot beams that are underutilised should have data limits increased.

  Recommendation 8: A targeted Indigenous Digital Inclusion program with a focus on access, affordability and digital ability be developed in partnership with Indigenous communities.

  Recommendation 9: Governments and industry should reduce barriers to people engaging with essential services online, including unmetering data for access to government sites.

  Recommendation 10: The Government commit to improving digital literacy in regional, rural and remote Australia by:

  a) Developing an online technology 'hub' to provide independent and factual information to help support people to build up the skills to solve telecommunications issues.

  b) Deploying technical advisers on a short-term basis across regional, rural and remote Australia to provide on-the-ground support to help people get connected and stay connected, using technologies that are suitable to their individual needs.

  c) Encouraging the agriculture sector to provide industry-specific advice about the Internet of Things and other digital applications that will drive productivity gains in the sector.

- ACCAN[59]

  "ACCAN proposes a 50 mbps unlimited broadband service offered at a wholesale price of $20 per month by NBN Co to households receiving government financial support.

  This would mean eligible households would pay approximately **$30 per month for unlimited broadband** – almost halving the current average cost.

  We estimate that providing this concession to the **1 million + households** on the lowest incomes can be **Federal budget neutral** and support these households to be connected."

- Australian Digital Inclusion Alliance[60] recommends the identification of a lead agency and the following:

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[58] http://www.rtirc.gov.au/

[59] http://accan.org.au/No-Australian-Left-Offline

[60] https://www.digitalinclusion.org.au/

DRAFT

Proposals for inclusion in a national strategy to bridge the divide

ADIA — Australian Digital Inclusion Alliance

	AFFORDABILITY	DIGITAL ABILITY	INCLUSIVE ACCESS
OBJECTIVE	Remove cost as a prohibitive barrier to internet access	Ensure everyone has the skills and confidence to fulfil basic internet activities	Allow everyone to use the internet including those living with a disability, from culturally or linguistically diverse backgrounds, or with other needs
2022 TARGETS #	90% of low-income households have an internet connection (from estimated 71%) * Reduce number of households in bottom two income quintiles spending >6% of income on communications ^	Increase the number of people who regularly engage with the internet to >90% (from 74%) **	All federal, state, local government websites are compliant with accessibility standards.
PROPOSALS FOR INCLUSION IN NATIONAL STRATEGY (in development)	1. Develop a suite of measures aimed at achieving affordability for most excluded groups 2. Low income communications subsidy 3. Mandate low income nbn wholesale product	4. Develop a nationally accepted digital competency framework 5. Increased funding for libraries for front-line digital training 6. Build on success of digital upskill programs such as Go Digi, Be Connected, Tech Savvy Seniors and Digital Springboard to address other targeted needs groups	7. COAG recommit to conforming with accessibility standards and implement tracking & measurement for all government digital services and products by 2022 8. Post secondary educational institutions incorporate inclusion and accessibility in ICT & design courses by 2022

NATIONAL AWARENESS CAMPAIGN ON NEED FOR DIGITAL INCLUSION

DEVELOP FRAMEWORK TO SET & MEASURE DIGITAL INCLUSION TARGETS

CONSULTATION PROCESS WITH LEAD ORGANISATIONS OF PRIORITY SEGMENTS

* fixed connection or alternative connection with >100Gb data allowance ABS data   ** AusPost – Digital Participation A view of Australia's online behaviours '16   # Targets to be developed/validated as part of the strategy

Attachment 2: NBN Futures Group

Members
Professor Trevor Barr, John Burke (convenor), Dr Leith Campbell, John Costa, Dr Richard Ferrers, Professor Peter Gerrand, Andrew Hamilton, Peter Hitchiner, Tim Herring, Dr Jim Holmes, Allan Horsley, Dr Murray Milner and Dr Craig Watkins

NBN Futures Forums conducted
Encouraging Debate on NBN Ownership Models, 31 July 2019
Realising the User Potential of the NBN, 22 October 2019
Learning from International Experience, 25 February 2020

Journal articles
Covering content presented in the first forum:
Leith Campbell and Murray Milner, "The NBN Futures Forum"
Peter Gerrand, "NBN Futures: The Option of Merging NBN Co with InfraCo, as a Benefit to the Digital Economy"
Jim Holmes, "Getting the NBN Infrastructure We Need"

Project overview:
Jim Holmes and Leith Campbell, "The NBN Futures Project

Covering content presented in the second forum:
Leith Campbell, "The NBN Futures Forum: Realising the User Potential of the NBN"
Teresa Corbin, "Promoting Digital Inclusion Through the NBN"

Covering content presented in the third forum:
Leith Campbell, "The NBN Futures Forum: Learning from International Experience"
Richard Ferrers, "Enhancing NBN's Value: Comparing NBN with Australia's Top 10 Trading Partners and OECD"

Submission to the Joint Standing Committee on the National Broadband Network
https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Broadband_Network/smallbusinessandcase/Submissions (Submission 20)