



AARNET SUBMISSION TO REGIONAL EDUCATION EXPERT ADVISORY GROUP

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Submitted February 1, 2019

INTRODUCTION

AARNet welcomes the opportunity to contribute to the development of the Government's National Regional, Rural and Remote Education Strategy¹ being undertaken by the Expert Advisory Group². AARNet has previously contributed submissions to the Independent Review of Regional, Rural and Remote Education³ and to the related 2018 Regional Telecommunications Review⁴. This response is consistent with those contributions, and is largely based on the information provided in our face to face consultation with the Expert Advisory Group on 15 January, 2019. We have also addressed most of the key questions identified against the 6 challenges outlined in the National Regional, Rural and Remote Education Strategy Framing Paper⁵.

TECHNOLOGY AND EDUCATION

Information and Communication Technology (ICT) continues to have had a deeply transformative impact on all aspects of the lives of individuals, institutions, business and government across the world. Many of the opportunities and challenges it creates, are underpinned by digital connectivity and access to the Internet.

Digital technologies are profound enablers of sustainable development and inclusive economic growth. The spread of the Internet and digital technologies has facilitated greater connectivity, reducing physical and functional barriers between people, businesses and governments.⁶

As noted in the framing paper, for any regional, rural or remote (RRR) community, long-term future economic growth is contingent on achieving improvements in education. Because education in the 21st century is increasingly facilitated, enabled and enriched through technology, effective and affordable digital infrastructure has the potential to enable significant improvements in education in RRR communities and the vitality of RRR Australia.

AARNet was established to address a market failure for digital connectivity in 1989 (when it pioneered the Internet in Australia) and continues to provide enabling infrastructure to Australia's education and research sectors (see *About AARNet*).

¹ <https://www.education.gov.au/national-regional-rural-and-remote-education-strategy>

² https://docs.education.gov.au/system/files/doc/other/regional_education_expert_advisory_group_-_terms_of_reference.pdf

³ <https://submissions.education.gov.au/Forms/IRRRRE/Documents/AARNet-Pty-Ltd.pdf>

⁴ https://www.communications.gov.au/sites/default/files/submissions/australias_academic_and_research_network_aarnet_pty_ltd.pdf

⁵ https://docs.education.gov.au/system/files/doc/other/national_regional_rural_and_remote_education_strategy_framing_paper.pdf

⁶ https://dfat.gov.au/international-relations/themes/cyber-affairs/aices/chapters/part_7_technology_for_development.html

RESPONSE

AARNET has provided responses against the terms of reference topics (with keywords highlighted in bold), and responses to selected questions from the framing paper that are applicable to AARNET's digital connectivity capabilities. We have also outlined a range of mechanisms to improve digital connectivity for educational institutions in RRR Australia.

Terms of Reference

AARNET supports the proposed **commissioner** to oversee the implementation of the National Regional, Rural and Remote Education Strategy particularly to better coordinate and align the strategies of the Federal and State governments across multiple portfolios to address the digital connectivity challenges facing RRR education.

Providing a metropolitan-equivalent (**parity**) digital experience for students attending institutions in RRR Australia is the basis of AARNET's argument for improving digital connectivity across RRR Australia for educational institutions. A range of strategies and policies and options for the Australian Government to consider, ideally in partnership with the State governments, is provided below (see *Digital Connectivity for Education Institutions in Regional, Rural and Remote Australia* below).

All educational institutions, regardless of location, need to have "location" (and by inference, "cost") removed as a **barrier** to their ability to access curriculum content, digital resources and online human collaborations as these enable teacher professional development, and support student learning. This includes schools, vocational training organisations, study centres, libraries, and university campuses, all of which have an impact on aspiration, access and success for regional students. The aspirations of students to undertake tertiary education are strongly influenced by teachers during school, so attracting and retaining quality teaching staff – in part by ensuring they have access to digital infrastructure – is critical.

The ability of institutions to offer places for regional students, and the associated additional costs of providing **support** to mitigate the challenges outlined in the framing paper are largely a function of funding. If the Government seeks to increase the number of university students in regional Australia, funding of student places needs to be increased (by removing the freeze on the demand-driven system perhaps) with additional funding to provide the additional support.

The regional study hubs program is an excellent infrastructure element that can be used to improve the student experience RRR Australia. The success of **study hubs** will be constrained unless funding for student places is increased to allow more students to participate in tertiary education, and their effectiveness in providing a parity experience with urban-based students will in part depend on insuring study hubs are well connected digitally.

Numerous reviews across multiple levels of government and multiple portfolios have identified the problem of regional digital disadvantage. There are also many policies and programs with associated funding and grants which could be better coordinated and **combined** to address this challenge at a national scale to delivery RRR community impact. This would be a key role for the proposed commissioner (see also *Program Alignment in Digital Connectivity for Education Institutions in Regional, Rural and Remote Australia* below).

Within the digital connectivity context, metrics need to be collected that reflect the actual delivered digital experiences to schools, TAFEs and universities, particularly in RRR Australia. For example, identifying that a

school is “fibre-connected”, is meaningless if the actual service delivered is 20Mbps, which is not unusual and much less than most homes now have. As an example of a **target-based** metric which is much more closely tied to student experience, in the NSW Department of Education Telecommunication Strategic Plan 2017-2020, the Department aims to deliver network speeds greater than 1Mbps per student by 2020, increasing to 5Mbps by 2025.

Key Questions

Challenge A: There are fewer study options available in RRR areas

1. What opportunities exist to expand options for further study in RRR areas?

The framing paper identifies “unreliable internet access” as an impediment to providing better access to RRR education through online learning, and this is addressed in some detail in *Digital Connectivity for Education Institutions in Regional, Rural and Remote Australia*, below. More specifically, for remote students, further improvements to the quota system applied to nbn’s SkyMuster-based satellite services are required. This might include reducing Public Interest Premise (PIP) specific Connectivity Virtual Circuit (CVC) prices, perhaps based on time of day, removing the ratio of minimum Access Virtual Circuit (AVC) to CVC bandwidth and increasing quotas available to PIPs during differentiated peak times.

2. What potential is there for universities, vocational training providers and other service providers to better work together in RRR areas, including opportunities to expand service offerings and better support articulation between VET and higher education?

There is significant opportunity to improve digital connectivity to support RRR education by aggregating the demand of universities and vocational training providers, as well as schools, libraries, study hubs, co-working spaces, and innovation/incubation hubs. A place or location centric approach amortises any investment in infrastructure, both digital and bricks and mortar, across more stakeholders, and facilitates a more collaborative, student-centred outcome. This is explored further in *Digital Connectivity for Education Institutions in Regional, Rural and Remote Australia*, below. The Statement of Principles for Australian Innovation Precincts⁷ might also inform policy and strategy in this area.

Challenge B: Relocating RRR students face significant financial, emotional and social challenges

3. What financial supports work best for students from RRR backgrounds, including those who choose to relocate?

AARNet has no position on this question.

4. What forms of support might be useful in helping students from RRR backgrounds to continue with their tertiary study?

Providing in-region facilities such as study hubs, supported by quality broadband services, encourages students to continue and complete studies in a less disruptive, lower living cost way.

5. How can universities assist RRR students to feel like they belong on their campus?

⁷ <https://www.industry.gov.au/sites/g/files/net3906/f/October%202018/document/pdf/statement-of-principles-australian-innovation-precincts.pdf>

AARNet has no position on this question.

Challenge C: Raising aspirations for tertiary education

6. What actions would help to raise aspirations and support informed career choices for students from RRR backgrounds?

As noted above, the aspirations of students to undertake tertiary education are strongly influenced by teachers during school, so attracting and retaining quality teaching staff, in part by ensuring they have access to digital infrastructure is critical. This is also true of counsellors. Providing access and visibility to the innovation economy through local innovation hubs would also better prepare students for 21st century opportunities.

Challenge D: RRR often experience multiple forms of disadvantage

7. What practical steps can be taken to support RRR students who experience multiple forms of disadvantage?

As noted above, ensuring RRR students have a digital experience that is at parity with students in metropolitan areas is a practical foundation step to supporting RRR students. Mechanisms by which this can be achieved are highlighted in *Digital Connectivity for Education Institutions in Regional, Rural and Remote Australia*, below.

8. How can we better support Indigenous people from RRR areas to access and succeed in tertiary education?

Although it may be a small element of supporting indigenous students to access and succeed in tertiary education, providing online access through improved digital connectivity is not a technical problem, regardless of location (thanks to the nbn; including the SkyMuster satellite services). There does however, need to be a program of education, skills development and support for indigenous students, potentially through their local schools.

Challenge E: Attracting people and jobs to RRR areas

9. How can tertiary education providers further stimulate economic growth in RRR areas?

The majority of Australian universities operate within and throughout regional Australia through a range of mechanisms including regional campuses, study centres, research facilities and partnerships with other institutions including TAFE s. They play prominent roles in their communities, not just as educational institutions, but as major employers, centres for support services and as community hubs.

Universities operating in RRR Australia also play a role as an anchor tenant for network infrastructure (from AARNet), which enables schools, TAFE's, hospitals, galleries, libraries, archives and museums (GLAMs) and other education and research institutions to reap the benefits of this transformative technology. The anchor tenant model is further described in *Digital Connectivity for Education Institutions in Regional, Rural and Remote Australia*, below.

In the 21st century, digital connectivity is just as important for regional development as bricks and mortar infrastructure. The quality of education, as well as health and other government services such as libraries and social services, are critical factors in determining where individuals and families choose to live. To

ensure Australia's regional communities remain vibrant, they must be attractive compared to urban communities, not only regarding the quality of home or residential and mobile telecommunications services, but also regarding the quality of services that are available regionally. For education, this means attracting and retaining the best teaching staff, providing those teaching staff with access to the most modern teaching methods and resources available, and ensuring the digital experiences students can enjoy in regional institutions are at least as good as those in metropolitan institutions.

10. What actions would further strengthen and increase the attractiveness of regional universities?

The major impediment to universities expanding further, including into regional Australia, is access to funding for additional student places. Given the central role regional universities play in their communities, not just as educational institutions, but as major employers, centres for support services and as a community hubs, they should also have access to regional development and other grant programs. A more place, or precinct-centred approach would also help increase the attractiveness of regional. The Federal government's City⁸ and Regional⁹ deals are one mechanism that could be applied to this, as could the learnings from the Statement of Principles for Australian Innovation Precincts¹⁰.

11. What policies would attract more metropolitan and international students to study at RRR areas, including regional universities and campuses?

AARNet has no position on this question.

Challenge F: Implementing and monitoring a national strategy

12. Would there be value in establishing a National Regional Education Commissioner to oversee the Strategy and, if so, what should their role be?

AARNet supports the proposed commissioner to oversee the implementation of the National Regional, Rural and Remote Education Strategy particularly to better coordinate and align the strategies of the Federal and State governments across multiple portfolios to address the digital connectivity challenges facing RRR education.

13. How should success be measured? What goals and targets, including for tertiary education attainment, should be considered both at a national and individual community level?

Other organisations, including AARNet's shareholder universities, will be better placed to respond to the specifics of this question, but the development of metrics that capture the quality of the digital education experience across the spectrum of home, school, VET and university experiences would inform progress towards parity goals. As an example of a **target-based** metric which is much more closely tied to student experience, in the NSW Department of Education Telecommunication Strategic Plan 2017-2020, the Department aims to deliver network speeds greater than 1Mbps per student by 2020, increasing to 5Mbps by 2025.

⁸ <https://infrastructure.gov.au/cities/city-deals/index.aspx>

⁹ <https://regional.gov.au/regional/deals/>

¹⁰ <https://www.industry.gov.au/sites/g/files/net3906/f/October%202018/document/pdf/statement-of-principles-australian-innovation-precincts.pdf>

Digital Connectivity for Education Institutions in Regional, Rural and Remote Australia

All schools, regardless of location, need to have “location” (and by inference “cost”) removed as a barrier to their ability to access curriculum content, digital resources and online human collaborations as these enable teacher professional development, and support student learning.

The Problem

A map of Australia’s telecommunications fibre infrastructure suggests much of regional, rural and remote (RRR) Australia is well served with fibre connectivity (see below). The vast majority of the fibre shown is owned and used exclusively by a single carrier (Telstra). Consequently, the only broadband services available to most of RRR Australia are those provided directly by Telstra, or delivered via a Telstra wholesale offering, with little or no competitive tension. Simple “fibre connectivity” does not reflect the availability, quality and affordability of broadband services available to residents and institutions in RRR locations, as the actual service provided to a “fibre connected” schools – say – may only be 20Mbps (less than many homes).



*Telecommunications Fibre in Australia (background is population density)
(source: ITU Interactive Transmission Maps, <https://www.itu.int/itu-d/tnd-map-public/>)*

The major barrier to other carriers providing competitive RRR services is the cost of accessing “backhaul” – a connection from a RRR location back to a substantive metropolitan area. Australia’s low population and geography mean that backhaul costs are not subject to commercial competition - the density of customers in RRR Australia is too low, and the distances to be covered are too great.

As a consequence, some form of intervention is required by governments to address this market failure.

Solutions

The following mechanisms can be used to reduce the cost of RRR telecommunications backhaul:

- Direct Intervention, by government
- Anchor Tenancy, to pull/push investment
- Demand Aggregation, within regions, at state level and nationally
- State Infrastructure Sharing, to facilitate alternate backhaul options
- National Broadband Network, as it provides services more appropriate for schools
- Program Alignment, at the state and national

Note that most of the mechanisms can be combined.

Direct Intervention

Governments frequently make direct investments in telecommunications infrastructure to RRR locations where competition is lacking. Ensuring this infrastructure can be shared and used by multiple carriers to offer competitive services, delivers the highest return on this investment

Direct Intervention – Fibre

The Federal Regional Blackspot Backhaul Program (RBBP)¹¹ funded fibre backhaul to a number of regional areas and incorporated a process for “access seekers” to gain access to the fibre. The access seeker process is administered by the successful tenderer for the project (originally Nextgen Networks, subsequently acquired by Vocus Communications). AARNet partnered with Nextgen and the Commonwealth to secure access to the RBBP fibres and has been able to provide transformational broadband services to a number of regional communities as a result, including Geraldton, WA¹², Emerald, QLD¹³ and Broken Hill, NSW¹⁴.

AARNet strongly supports the construction of competitive backhaul fibre to connect regional, rural and remote Australia with strong open access provisions.

Direct Intervention – Mobile

The Federal government has funded several rounds of Mobile Blackspots Funding¹⁵ to expand mobile coverage in RRR Australia. This has been supplemented by similar significant investments by most state governments¹⁶. A range of mobile tower “open access” arrangements have been put in place with these programs to enable more competition, with varying levels of a success. The backhaul connections from mobile phone towers have generally not been considered as part of the open access provisions, but could make a significant contribution to improving fibre connecting in RRR Australia.

AARNet recommends that the backhaul infrastructure funded through mobile blackspots programs be made open access.

Anchor Tenancy

Some organisations seeking to establish a broadband connection in RRR Australia are of sufficient size

¹¹ <https://www.vocus.com.au/our-network/regional-backbone-blackspots-program>

¹² <https://news.aarnet.edu.au/durack-connects-to-aarnet-leading-the-way-for-vocational-education-training-in-wa/>

¹³ <https://www.cqu.edu.au/about-us/locations/emerald>

¹⁴ <https://sydney.edu.au/medicine-health/clinical-schools/broken-hill-rural-health.html>

¹⁵ <https://www.communications.gov.au/what-we-do/phone/mobile-services-and-coverage/mobile-black-spot-program>

¹⁶ For example, NSW (<https://www.nsw.gov.au/improving-nsw/regional-nsw/regional-growth-fund/connecting-country-communities/>), Victoria (<https://www.premier.vic.gov.au/fixing-more-mobile-blackspots-across-regional-victoria/>)

and/or able to attract sufficient funding to cover the telecommunications carriers' cost to build fibre backhaul to the RRR location. This can be achieved either through a once-off capital investment (CAPEX) or a long-term (typically multi-year) operational investment (OPEX). An **anchor tenant** organisation is willing to have the fibre backhaul infrastructure built to deliver their service, used to support other organisations (via their, or another, telecommunications carrier).

Anchor Tenancy – CAPEX

Laying bundles of fibre optic cable in RRR Australia is a very CAPEX intensive activity as it involves civil engineering work over great distances. Once in place however, fibre has a very long (multiple decades) return on investment and can support upgrades in capacity with relatively modest occasional investments in technology. One-off grant programs are therefore ideal mechanisms to support the construction of regional backhaul fibre. These can be specific broadband programs such as the Federal RBBP noted above or the NSW Connecting Country Communities program¹⁷, large scale programs with a broadband element such as the NSW Snowy Hydro Legacy Fund¹⁸, or sector-specific programs that can be applied to broadband infrastructure such as the Education Investment Fund (EIF).

Some parts of AARNET's regional fibre infrastructure have been funded through EIF grants received by AARNET university members to establish connections to campuses (ie. anchor tenants) in Wagga Wagga in NSW, and Whyalla and Mount Gambier in SA. This fibre infrastructure has then supported the connections of schools and libraries in these communities at the same high level of service and on the same cost basis as institutions in metropolitan areas, and been made available on a swap basis with commercial carriers wishing to offer services within and along the route to these destinations.

AARNET strongly supports the use of CAPEX investments to build open access fibre backhaul.

Anchor Tenancy – OPEX

In some circumstances it may not be possible to fund a fibre backhaul build as a single CAPEX investment. However, an organisation can play an anchor tenancy role by committing their OPEX funding for the services they require over multiple years to solutions that are based on open access fibre infrastructure. This creates a revenue stream that can fund a CAPEX investment in fibre. This model was applied by the province of Alberta, Canada as part of the Alberta SuperNet project¹⁹ where the provincial government was the anchor tenant.

AARNET supports long-term commitments of OPEX to investments based on open access infrastructure.

Demand Aggregation

Aggregating the broadband demand of a RRR community can mitigate the lack of commercial competition, particularly when the costs of building fibre backhaul needs to be amortised across multiple stakeholders.

The larger the community involved, the more successful such a demand aggregation approach can be, but it

¹⁷ *To invest in communications infrastructure and deliver improved regional voice and data connectivity.*

<https://www.nsw.gov.au/improving-nsw/regional-nsw/regional-growth-fund/connecting-country-communities/>

¹⁸ *Improving digital connectivity across regional NSW,* <https://www.nsw.gov.au/improving-nsw/regional-nsw/snowy-hydro-legacy-fund/>

¹⁹ *The SuperNet was built to connect public institutions (which include schools, hospitals, colleges, universities, libraries, and municipal offices) to a broadband network for high-speed Internet access, video conferencing and other services.*

Many Internet Service Providers (ISPs) also use it to deliver Internet services to rural consumers, <https://www.alberta.ca/supernet.aspx>.

can be challenging to align the timeliness and requirements of a larger community. This is particularly true in RRR Australia where many (most) of the larger broadband stakeholders in RRR communities are agencies from local, state and federal governments (schools, libraries, hospitals and healthcare, social services, transport services, etc.).

Demand Aggregation – Location

Although demand aggregation based on physical location or locale would appear to offer the broadest impact, the varying mission and funding priorities of organisations within the locale make this very challenging. Programs that have progressed down this path, such as the Federal Government City Deals²⁰ and Regional Deals²¹ have had limited impact to date.

Successful demand aggregation projects are typically facilitated by a regional entity such as the Catholic Education Office within a diocese, or delivered on the back of other (often anchor-tenant driven) investments. Examples of the later include the Highlands Health Education and Research Network²² which reticulates AARNet services to several independent schools in the Moss Vale, NSW region using infrastructure provided by a local IT provider (radio links on a tower), and the partnership between the Townsville, QLD City Council, James Cook University and AARNet²³.

AARNet actively promotes and facilitates location-based demand aggregation approaches to building fibre infrastructure into and within RRR Australia.

Demand Aggregation – National, State

Federal government agencies and the state Departments of Education and Health are some of the largest organisations in Australia, and are able to use the scale of their annual telecommunications spend to ensure they can provide broadband services to all the RRR locations they operate in, typically through multi-year contracts with commercial carriers. These contracts have in the past resulted in fibre being extended into RRR regions, but without this fibre being accessible to other carriers, or having alternative carriers operating in the region, the actual delivered broadband services are often not price competitive with metropolitan areas. Further, the investments made by different agencies, do not provide leverage for each other, or for commercial organisations also operating in the region.

It should be noted that the “flip side” of a centralised procurement process that aggregates the broadband requirements of a single agency, is that if all sites are “locked in” to a particular arrangement, it reduces the ability to accommodate innovative and/or alternative approaches that might be available to a specific school or schools in a particular region.

Demand Aggregation – Sector

An alternative aggregation approach is to bring multiple organisations within a single sector together to address their specific needs. AARNet was established by the universities and CSIRO to provide the ultra-high bandwidth, ultra-high quality broadband services required by the Australian Education and Research sector. This includes extending services to regional, rural and in some cases remote Australia where AARNet’s shareholders (the universities and CSIRO) and customers (schools, TAFE’s, libraries, galleries, research institutes, etc.; any organisation engaged in education or research) may have campuses, facilities and

²⁰ <https://infrastructure.gov.au/cities/city-deals/index.aspx>

²¹ <https://regional.gov.au/regional/deals/>

²² <https://hhern.net.au/>

²³ <https://news.aarnet.edu.au/fibre-optic-sharing-in-regional-australia-to-create-opportunities/>

research instruments.

AARNet's mission is to enable globally competitive research, education and innovation by providing transformational connectivity and collaboration services to meet the unique needs of our customers²⁴.

National Broadband Network

The wholesale services provided by the National Broadband Network (nbn), and its physical rollout have to date been directed towards individual residences and homes. These services are too expensive and technically inadequate to meet the needs of schools or institutions, given the intense usage profile of schools (between 9am-3pm), the concentration of users (typically hundreds of students and teachers) and the increasing dependency of schools on high bandwidth, high quality, and always-available broadband. For schools in large portions of RRR Australia that can only receive services via nbn's SkyMuster satellite, even the nbn Public Interest Premise (PIP) arrangements fail to meet the needs of all but the smallest schools (but are obviously better than nothing). For remote distance education students, the SkyMuster service is currently constrained by a wide range of complex quotas, further limiting the ability it has to serve these very disadvantaged students.

AARNet does not recommend the use of nbn residential services for the connection of schools (except when there are no other commercially viable options).

National Broadband Network – Enterprise

In late 2018, nbn introduced their first service to support business and government requirements – Enterprise Ethernet. Enterprise Ethernet provides significantly higher speeds (up to 1Gbps) at lower cost. It is delivered over fibre, by connecting a customer site back to nbn's existing fibre network (by laying new fibre, at a cost if necessary) and then presenting the service at an nbn Point of Interconnect (POI). This partly addresses the backhaul issue, as there are relatively few nbn POIs serving RRR Australia, and they are well connected to competitive fibre, eg. an Enterprise Ethernet services provided to a location in Eden, NSW might be presented at the POI in Nowra, which is much closer to Sydney.

Perhaps more importantly, when an Enterprise Ethernet connection is established to an organisation in a local area, nbn's fibre footprint expands, enabling other organisations to more easily obtain an Enterprise Ethernet services. nbn has indicated that in some circumstances they will contribute to the cost of Enterprise Ethernet fibre builds to support this model.

nbn has also recently announced a Business Satellite offering which may be more appropriate for schools.

AARNet recommends that careful attention be paid to the emerging nbn Enterprise Ethernet and Business Satellite offerings and their applicability to schools in regional, rural and remote Australia.

Shared State Infrastructure

Prompted by consistent and persistent feedback regarding the inadequacy of fixed and mobile broadband services from communities and businesses in RRR Australia, most state governments (WA, VIC, QLD, NSW, SA) have initiated programs of work to address regional digital disadvantage. Having undertaken an audit of state-owned telecommunications infrastructure and they are now exploring a range of options as to how this might be leveraged to address the backhaul issues noted in this paper.

²⁴ <https://www.aarnet.edu.au/about-us/strategy/>

AARNet's experience working with a range of state-owned entities is that such an approach can be extremely effective. Within Queensland, much of AARNet's network North of Brisbane operates over fibre infrastructure owned by Powerlink. In NSW AARNet works with TransGrid to facilitate connections into regional areas North, West and South-West of Sydney, and Essential Energy within regional centres. AARNet partners closely with SABREnet²⁵, a partnership between the SA universities and the SA government to facilitate access to state government fibre infrastructure, to provide "last mile" connections to customers in the Adelaide metropolitan area. These arrangements enable a wide range of university, research organisations, TAFEs and schools operating outside Australia's main metropolitan areas to gain access to AARNet that would otherwise be unable to do so.

It's important to note that fibre access arrangements that are provided on a cost recovery basis, and not to generate revenue for the state (as these examples are), encourages use of the fibre and improves outcomes for regional communities.

AARNet strongly recommends that state government continue to explore mechanisms to make state-owned telecommunications infrastructure available on an open access, cost recovery basis.

Program Alignment

The lack of broadband with RRR Australia, particularly for educational purposes and educational institutions, has been highlighted in numerous reports across multiple portfolios, for example:

- Federal (Telecommunications) – 2018 Regional Telecommunications Independent Review²⁶
- Federal (Education) – 2017 Independent Review into Regional, Rural and Remote Education²⁷
- Federal (Industry) – Statement of Principles for Australian Innovation Precincts (2018)²⁸
- State (Infrastructure) – NSW State Infrastructure Strategy²⁹
- State (Infrastructure) – Victoria's 30-Year Infrastructure Strategy³⁰

The responses to these identified challenges, if any, are usually in the form of small-scale programs that do not have a broad-based impact on the existing educational digital infrastructure particularly at the schools and VET level. Moreover, most programs are disconnected from each other across different layers of government, and from other initiatives within other portfolios that could/should be supportive, particularly regional development.

AARNet strongly recommends the need for a commissioner to better coordinate and align the strategies of the Federal and State governments to address the challenges facing RRR education.

²⁵ *The South Australian Broadband Research & Education Network (SABREnet)*, <http://www.sabrenet.edu.au/>

²⁶ <http://www.rtrc.gov.au/>

²⁷ <https://www.education.gov.au/independent-review-regional-rural-and-remote-education>

²⁸ <https://www.industry.gov.au/sites/g/files/net3906/f/October%202018/document/pdf/statement-of-principles-australian-innovation-precincts.pdf>

²⁹ https://insw-sis.visualise.today/chapters/Digital_connectivity_and_technology.pdf

³⁰ <http://www.infrastructurevictoria.com.au/30-year-strategy>

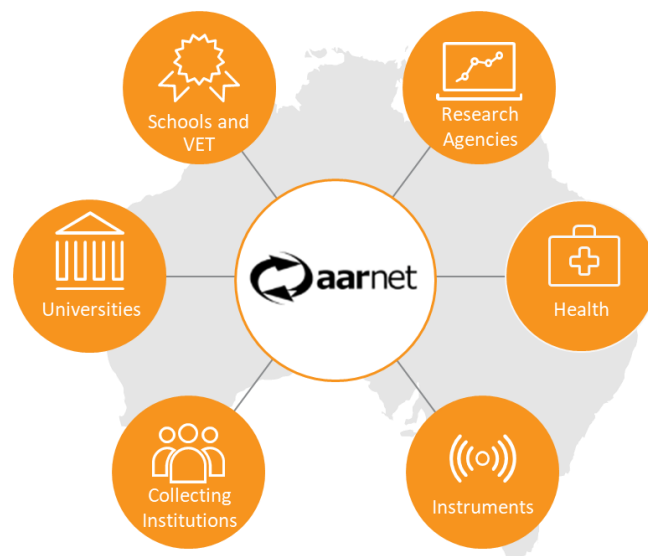
ABOUT AARNET

The Australian Academic and Research Network (AARNet) was established in 1989 by the (then) Australian Vice-Chancellors Committee and CSIRO to create Australia's National Research and Education Network (NREN). Like other NREN's around the world, AARNet interconnects its member's institutions nationally, and provides international connectivity via other NRENs to the global research and education community. AARNet brought the Internet to Australia and pioneered the use of Internet technologies and applications.

Today, AARNet is a licensed telecommunications carrier operating as a not-for-profit company limited by shares and owned by the universities and CSIRO. AARNet provides ultra-high speed, very high-quality broadband telecommunications services that are not commercially available (technically unique), or not available at reasonable cost (commercially unique) to **all Australian research and education organisations**. AARNet has over 200 directly connected member and customer institutions. Members are the **Australian universities and CSIRO**, and customers include scientific research organisations, numerous **TAFE's** and training organisations including health training, more than 700 **primary and high schools**, and a variety of galleries, libraries, archives and museums (GLAMs). AARNet's operational costs are covered through a membership subscription model.

AARNet provides educational institutions with access to content, resources, and people that **enable the creation and delivery of new digitally-enabled educational experiences**. For educators and researchers, in an increasingly globalised and digitally-enabled world, AARNet **removes barriers to innovation**.

Australia's NREN, AARNet, is a national asset and is a critical factor in supporting research and education excellence.



AARNet's Interconnected Communities – Universities, research agencies, schools, Vocational Education and Training (VET) institutions, health facilities, research instruments, and Galleries, Libraries, Archives and Museums (GLAMs); collecting institutions)