“Our values – one team, creativity and trust – are fundamental to AARNet’s culture and drive how we work with each other and our customers and partners.”

CHRIS HANCOCK, CEO AARNET
Since 1989, AARNet, Australia’s Academic and Research Network, has provided ultra high speed, ultra high quality broadband and collaboration services to institutions within the Australian education and research sector.

AARNet is a national resource, a National Research and Education Network (NREN) run by AARNet Pty Ltd, a not for profit company owned by 38 Australian universities and CSIRO.

AARNet’s customers include the shareholder universities (listed on page 37) and CSIRO, as well as most of the publicly funded research agencies, such as Australian Nuclear Science and Technology Organisation, Geoscience Australia and Australian Institute of Marine Science, several state government agencies, hundreds of schools, many TAFEs and hospitals, and most state and federal galleries, libraries, archives and museums.

AARNet infrastructure interconnects over two million users—researchers, faculty, staff and students—at institutions across Australia with each other and research and education institutions worldwide, the public Internet, and resources such as scientific instruments, data storage and high performance computing facilities. We also interconnect content and service providers and organisations that collaborate with the research and education community.

AARNet underpins education across the life-long learning spectrum and research across a diverse range of disciplines in the sciences and humanities, including high energy physics, climate science, genomics, radio astronomy and the arts.

For researchers and educators working in today’s increasingly globalised data-intensive world, AARNet removes barriers to discovery and innovation.
This map is designed to be a conceptual representation of the international R&E network.
AARNet supports life-changing research across a diverse range of disciplines in the humanities and the sciences, including the work of Dr Bettina Berger, Scientific Director of the Australian Plant Phenomics Facility, pictured here in the high-throughput SmartHouses at the Facility’s Adelaide node, The Plant Accelerator®. Image courtesy Australian Plant Phenomics Facility.
MESSAGE FROM THE CHAIR

I am pleased to report that it has been another successful year for AARNet. A great year for AARNet is one that not only generates a solid business performance, but one that enables our customers to improve the performance of research and education in Australia and which in turn sustains our nation’s global competitiveness.

For nearly 30 years AARNet has been reporting on the development of its world-class national research and education network infrastructure and excellence in network operations and service delivery. This report is an update on our activities and the value that we are delivering to our shareholders. It also showcases some of the ways in which customers are leveraging the AARNet network and services to make the most of opportunities available to them.

Today, we believe AARNet remains a model business, an exemplar of an academic/business partnership that has endured in the highly regulated world of telecommunications to become one of the world’s leading National Research and Education Networks (NRENs). These are exciting times for AARNet. We are operating in a rapidly changing technology and regulatory environment that in recent years has seen the business evolve and quickly grow from a small organisation to a medium scale company to ensure the unique needs of our shareholders and customers continue to be met.

A number of factors are influencing our business: Australia’s bipartisan approach to national security and fast-tracked legislation, coupled with the demands of the research and education sector’s rapid adoption of cloud services and the growth of data. This means that information and network security are increasingly important to AARNet and we are looking at new ways to collaboratively support our shareholders and customers to manage security and risk.

AARNet is focused on ensuring that Australia’s research and education community has the long-term infrastructure it needs to remain connected to peers and resources nationally and to international partners. To this end, we are consortia partners in the Indigo and JGA subsea cable system projects to boost capacity to Asia and across the country. We achieved significant progress against milestones this year, with Indigo set to be operational by mid 2019 and JGA the following year.

Nationally, outstanding progress has been made on Project Triversity, which will see AARNet own more alternative network paths around the country to improve network redundancy and reliability.

With universities facing increasing pressure to both deliver an exceptional student experience and to support data-intensive research, AARNet continues to develop its portfolio of services in partnership with shareholders, NREN colleagues globally and vendors. Cross-institutional collaboration is evolving rapidly. In response, the AARNet team continues to grow our customer base, connecting schools, TAFEs, hospitals, galleries, libraries, archives and museums, providing pivotal linkages between our shareholders and the broader research and education ecosystem.

As Chair of the AARNet Board I would like to thank my fellow Board Members, the AARNet Advisory Committee and all of you our shareholders for being so supportive of the AARNet journey. Finally, I would especially like to acknowledge the CEO Mr Chris Hancock, his leadership team and each and every one of our AARNet team for their outstanding professionalism and dedication.

We are confident that we are continuing to create great value for our shareholders and customers and we look forward to delivering further success in the year ahead.

Gerard Sutton AO, Chair AARNet Board
MESSAGE FROM THE CEO

This past year has seen AARNet expand and scale-up its operations to meet the technical demands of the services required by our customers. We continue to believe that “business as usual” is not an option for our position at the intersection of the telecommunications, information technology, research, education, and training sectors.

For many of the research domains we serve it is no longer a matter of simply connecting researchers to each other; the challenge is developing and optimising “big” data workflows throughout the research data lifecycle. AARNet’s ability to provide support in real time for our teaching and learning colleagues has changed the very nature of AARNet’s value proposition and relevance. In addition to this, cyber security has become a critical driver for how we deliver our existing services and how future capabilities are developed. Consequently, AARNet saw a massive shift of focus to project management and delivery in 2018.

This year was the first of our new five-year 2018-2022 strategic plan which lays out the strategic platform and priorities that guide our investments in network and technology solutions for our shareholders and customers.

Our operations are underpinned by three key pillars that drive our strategic performance and successful delivery: operating Australia’s research and education network, growing our communities and developing technology services to meet the needs of our customers.

During 2018 we identified six strategic priorities. The first priority, Own the Infrastructure, captures a key plank of our how we build long-term sustainability and service differentiation. Domestically, this is about owning fibre optic cable in the ground, and Project Triversity, which will expand AARNet’s national fibre backbone to alternative fully redundant and diverse paths and further strengthen the reach and reliability of our services. Internationally, this is exemplified by the Indigo and JGA subsea projects, which are now coming to fruition.

Our second priority is providing the necessary long-term Infrastructure for Health and Medical Research. AARNet has already commenced significant engagements with both Bioinformatics and Medical Research institutes and we see this as an area of significant development during the coming decade. AARNet’s CloudStor service now serves over 65,000 users across our community and forms the foundation for the development of a National Collaborative Research Storage Platform – our third priority. To achieve this AARNet is working in close collaboration with the eResearch ecosystem to become the data connector for Australia’s innovation system and to ensure widespread delivery of effective services for all the key research domains.

Fourth, is to lead the sector in the development of Cyber Security Capability, Services and Infrastructure. During 2018 we developed an Early Warning System to proactively detect cyberattacks, introduced a DDoS mitigation product and developed the case for a Security Operations Centre to provide 24-hour surveillance and monitoring across our shareholder networks.

Wherever possible, we have continued to focus on building Regional Infrastructure, our fifth priority, to extend the reach of the network to improve access to affordable broadband services for campuses, study hubs and scientific instruments across regional Australia.

Finally, our sixth strategic priority is to Optimise for Customer Value by developing processes and systems to improve the AARNet customer experience. This includes streamlining our ‘on boarding’ engagements and providing metrics that capture the value of the services our customers consume.

Throughout 2018, we undertook a process to identify, capture and introduce AARNet’s values - One Team, Creativity and Trust. Our values are fundamental to our culture, embedded into our recruitment, training and performance management processes and underpinned by a strong emphasis on the development of Human Resource initiatives for all of our staff.

None of our achievements throughout 2018 would have been possible without a highly committed AARNet Board, AARNet Advisory Committee and our people. I would like to personally thank our customers and everyone engaged with AARNet this past year for their support and we look forward to continuing to grow our services and delivery to you all.

Chris Hancock, Chief Executive Officer

SELECTED FINANCIAL DATA ($M)

2014 2015 2016 2017 2018
Net assets Surplus Cashflow from operations

Figures for 2014–2016 do not include the effect from the adoption of AASB15: Revenue from Contracts with Customers.

This year was the first of our new five-year 2018-2022 strategic plan which lays out the strategic platform and priorities that guide our investments in network and technology solutions.
HIGHLIGHTS
THE YEAR IN NUMBERS

$214.20
Net assets in millions

$30.9 million
invested during 2018

144 AARNET4 VPNS DEPLOYED \(\uparrow 60\% \) (COMPARED TO 2017)

140,286
International visitors to
Australian institutions

435,790
Australian visitors to
Australian institutions

80,323
Australian visitors to
international institutions

110,648
Users

78 TB
Data stored

522,175
Hours of video viewed

718,175
Users

627 TB
Data stored

106,683
Users

495,973
Meetings

495,973
Meetings

61,588
Users

495,973
Meetings

140,286
International visitors to
Australian institutions

TERABIT NETWORK FOR RESEARCH AND EDUCATION
AARNet provided high levels of network performance and availability in 2018. The average network availability was 99.92%, which was slightly lower than the level achieved in 2017 (99.95%). The reduction was due to prolonged outages experienced on a submarine cable between Australia and Singapore operated by a third party; excluding the effect of those outages the level of availability was 99.99%.

This exceptionally high level of reliability is achieved over the vast geographic footprint of our infrastructure through strategic long-term planning and well-architected network redundancy. Diversity in the network design and equipment enabled the operations team to deploy alternate paths and minimize the impact of the outages on AARNet customers.

A key part of achieving AARNet’s mission is the operation of a broadband network that provides ultra high quality, highly available and resilient national and international telecommunications services to meet the unique needs of the research and education sector.

The peak demands of the academic year determine the sustained capacity required, and the needs of the most data-intensive research disciplines, such as radio astronomy, climate science and bioinformatics, determine the absolute peak capacity. AARNet continually monitors the network load of our customers, as a percentage of the capacity generated by each link rather than the absolute volume of traffic, to determine when network upgrades are required.

EXPANDING INTERNATIONAL CAPACITY
In early 2018, AARNet increased international capacity on the Perth to Singapore and Sydney to Singapore circuits from 2.5 gigabits per second (Gbps) to 10Gbps to support growth in traffic between Australia and Asia.

Significantly, AARNet secured long-term access to three new international cable paths to Asia and beyond, through the Indigo, JGA and CAE-1 projects.

INDIGO AND JGA SUBSEA CABLE SYSTEMS
In a first for the Global R&E community AARNet has invested in two new submarine cables; Indigo and Japan-Guam-Australia (JGA) South. Indigo is an approximately 9,000km cable system linking Sydney, Perth and Singapore, and JGA-S will link Sydney to Guam and onto North Asia. Participation in both these cable consortia will provide the research and education community in Australia with lifetime asset ownership of highly sought-after international cable capacity. Importantly AARNet will have the flexibility and capability to independently light its share of the

AARNet continually monitors the network load of our customers, as a percentage of the capacity generated by each link rather than the absolute volume of traffic, to determine when network upgrades are required.
as a licenced telecommunications carrier and able to deal
SingAREN and TEIN*CC with AARNet making six partners in
100G circuits from Singapore to London. Initiated and led
Research and Education Networks (NRENs) to jointly procure
by AARNet of a small consortium of international National
The third major international initiative was the establishment
project is complete, with “ready for service” expected in Q1 2020.

EXTENDING OUR REACH IN AUSTRALIA
Our customers increasingly value the reliability of the AARNet network, particularly for accessing the essential cloud services their operations depend upon. This year we continued to see a growing number of customers across the sector, including universities, schools, hospitals and other research institutes, upgrading their connections.
As their demand for bandwidth increases, more K-12 schools are now ordering multiple 10Gbps paths, rather than the single 1Gbps connection they historically opted for. Similarly, universities are choosing multiple 10Gbps connections to support not only big science research, but also their critical day-to-day business operations.

Around the country, AARNet’s Infrastructure Development Group delivered a number of network upgrades and expansions to the network’s fibre footprint, including:
- Multiple 10Gbps diverse connections for K-12 schools in Sydney and Melbourne
- 100Gbps diverse connections for University of Queensland data centres and numerous other data centres around the country
- Augmenting the thick fibre rings in capital cities: work completed in Melbourne, Sydney and Brisbane
- Supporting sport science education with a connection for the University of New England campus located in Sydney Olympic Park

ON-NET DOMESTIC TRAFFIC
The best network experience for AARNet customers is realised when they are communicating with other AARNet-connected customers and AARNet-peered service providers. This is called “on-net” traffic. The amount of on-net domestic traffic continued to grow, accounting for 85% of all Internet traffic in 2018. The figure reflects the move by many global content and cloud services providers to host and deliver content and services accessed by our customers within Australia. As we have noted previously, AARNet is increasing its capacity to selected domestic service providers (peers).
AARNet continues to enter into partnerships to directly connect popular global content and service providers to the AARNet network. This improves the performance and availability of the services and because traffic to and from on-net sites is not metered, provides substantial cost savings for AARNet customers.

INFORMATION SECURITY
During 2018, AARNet defended against Denial-of-Service and Distributed-Denial-of-Service (DDoS/DDoS) attacks and focused on helping stakeholders and the wider community understand, mitigate and respond to security issues.
AARNet has now implemented an Early Warning System for AARNet customers. This brings the total number of NRENs represented in this consortium to 20, plus Enel (the United States Energy Sciences Network). During the Asia Pacific Advanced Network Meeting in New Zealand in August 2018 a briefing session was conducted to promote the Global group through the Asia Pacific region. Working closely with REANZ (the New Zealand Research and Education Network), using the Global NREN Security Baseline Document, we provided sessions to MoRAN (the Mozambique Research and Education Network) and UbuntuNet Alliance (the regional networking organisation for Eastern and Southern Africa) to establish information security capabilities in their region.
As part of AARNet’s customer engagement program, the AARNet security team conducted a cyber security state-based update session with the Victorian universities and a Table-top Incident Response exercise with the Western Australian universities.

We anticipate launching a pilot with a small number of universities early in 2019. The Global NREN Security group, of which AARNet is a founding member, welcomed a number of new members during 2018.

Building submarine cables is a very different, highly specialised business. AARNet has been fortunate to have, as its partners in these two cable projects some of the world’s most skilled and experienced submarine cable owners; among them Telstra, Singtel, Google and SubPartners, ensuring a quality system deployment.

The cable commissioning phase of the Indigo cable project is complete, with “ready for service” expected in May 2019. All manufacturing of the 26km cable is complete, with “ready for service” expected in Q1 2020.

COLLABORATION ASIA EUROPE
The third major international initiative was the establishment by AARNet of a small consortium of international National Research and Education Networks (NRENs) to jointly procure 100G circuits from Singapore to London. Initiated and led by AARNet, this consortium is named CAE-1 (Collaboration Asia Europe) and comprises SURFnet, NORDUnet, GEANT, SingAREN and TEIN*CC with AARNet making six partners in all. As a licenced telecommunications carrier and able to deal at the wholesale level, AARNet has entered into a long-term agreement for capacity on SeaMeWe5 from Global Switch in Singapore to Equinix London. This is a model framework for the world’s R&E networks to aggregate their purchasing power and acquire long term tenancy on major international trunk routes.
When all three new investments become operational AARNet will have made a very significant contribution to research and education in Australia by providing a model of geographic disadvantage with lifetime ownership of economically sustainable international connectivity.
Within Australia, traffic between universities grew by 35% in 2018. This traffic was predominantly research data, reflecting an increase in cross-institutional collaborations and data-intensive research across the sector.
LIGHTING UP K-12 SCHOOLS AND TAFES

Throughout 2018, Australian schools and TAFEs continued to take advantage of the benefits of AARNet in increasing numbers; both new customers accessing powerful R&E network bandwidth for the first time, as well as schools already connected to AARNet that used their access to collaborate with content and cloud service providers and innovate in teaching and learning.

By the end of 2018 over half a million K-12 school students at more than 1,200 schools were connected to AARNet. AARNet continued to focus on improving access to high speed broadband for K-12 schools in regional Australia, notably connecting schools in regional Victoria, as well as in Emerald in Far North Queensland as part of a project underway with the Catholic Diocese of Rockhampton. This project will see all the schools in the diocese across regional Queensland progressively connected to the network during 2019.

AARNet worked with many K-12 schools, delivering network solutions and seeding interactions and collaborations between school students and universities, galleries, libraries and museums connected to AARNet.

COLLABORATING IN THE PACIFIC REGION

AARNet’s long-standing effort to support better broadband for education and research in the South Pacific continued, with AARNet connecting Fiji National University (FNU) in 2018. AARNet’s Enterprise Services team supported the rollout of this enhanced connectivity to 35 campuses across the Fiji islands. FNU staff also travelled to Australia during the year, visiting Australian universities and technology companies to help develop their own capabilities.

BUILDING DIGITAL PRESERVATION INFRASTRUCTURE FOR GLAMS

Many of Australia’s national and state galleries, libraries, archives and museums (GLAMs) are now connected to AARNet. With this underlying network connectivity in place, AARNet is focused on delivering services “above the network” to enable the GLAM community to preserve and share their globally significant collections. AARNet’s Cloudstor service plays a key role in this endeavour and helps GLAMs strengthen their capacity to seize new opportunities for collaborative research, engagement and outreach; develop large scale, data driven services; and richly engage with their communities through high fidelity video connections. GLAMs working with AARNet have the opportunity to leverage unequaled access to storage and compute resources all connected to the research network, enabling humanities, arts and social science research and partnerships to flourish.

AARNet is a participant with Swinburne University and the Australian Centre for the Moving Image in the Play it Again project awarded a grant in 2018 to investigate emulation as a service for the preservation of Australia’s video game heritage.

SUPPORTING INNOVATION IN HEALTH AND MEDICAL RESEARCH AND EDUCATION

By connecting researchers and educators at university campuses, health research organisations, health systems and health precincts across Australia, AARNet underpins and enables life changing research and innovation in education for the next generation of health researchers and medical practitioners.

The number of health education and research facilities connected to AARNet continued to grow during 2018, while eduroam was deployed in more hospitals and health-related institutions to support mobility between campuses, research facilities and hospitals for students, faculty and researchers.

With the volumes of data used in health research increasing exponentially – primarily due to rapid advances in genomic sequencing capabilities – the need for high-speed network access has become vital for moving data generated in a clinic or laboratory to supercomputing resources for analysis and on to researchers at institutions across the country.

ENGAGING & GROWING THE RESEARCH, EDUCATION & INNOVATION COMMUNITIES

AARNet fosters collaboration, knowledge sharing and discovery by connecting organisations with a research and education mission across Australia and working closely with them to provide the infrastructure and services they need to deliver excellence in research and education.
AARNet is aligning effort and strategy across research disciplines in the sciences and humanities to find common research infrastructure elements that can then be rolled out more broadly as services to aid researchers in AARNet shareholder institutions.

During 2018, AARNet strengthened its collaboration with the national Data and Digital eResearch Platforms (DDeRPs): the Australian Research Data Commons (ARDC), Australian Access Federation (AAF), the National Computational Infrastructure (NCI) and the Pawsey Supercomputing Centre.

In partnership with the DDeRPs, AARNet participated in strategic discussions with NCRIS (National Collaborative Research Infrastructure Strategy) facilities and is working closely with the DDeRPs and wider eResearch community to develop solutions to address the collective need for sustainable persistent data tools and data services, secure cloud storage, transfer and compute services for sensitive data and a sustainable model for national data collections.

The eResearch team was also involved in developing the foundations of the Pathfinder Project for the Bioinformatics Commons. This project will be a joint undertaking of BioPlatforms Australia, the Australian Research Data Commons (ARDC) and AARNet. The activities of the project will significantly enhance our understanding of state-of-the-art life science data infrastructure with the specific future goal of establishing an Australian life science data infrastructure that will enable over 30,000 life science researchers across Australia.

We worked closely with the Australian Academy of the Humanities to provide information and advice to support initiatives aimed at scoping a national facility for humanities, arts and social sciences.

Our engagement with the international NREN, eResearch and Research Data communities also continued to ensure that our services are leading edge and leveraging international innovations. In 2018, AARNet joined the Research Data Alliance, an international organisation launched in 2013 by the European Commission, the United States National Science Foundation and National Institute of Standards and Technology, and the Australian Government’s Department of Industry, Innovation and Science with the goal of building the social and technical infrastructure to enable open sharing of data.

A partnership with the Australian National University (ANU) Library to unlock the Sydney Stock Exchange records and make them accessible as inputs to research. (Read more in the Spotlight story on page 46). The trial to use CloudStor as a transit space for a digitisation workflow (on-net) is complete and ANU digitisation specialists are able to choose from a range of tools and techniques as part of their digitisation workflow.

A partnership with Macquarie University eResearch colleagues to lead, program, and deliver the first dedicated stream for humanities, arts, and social science researchers and academic and data librarians at the Sydney Research Bazaar. This afforded AARNet the opportunity to liaise with and call in research and data infrastructure specialists to deliver domain relevant introductory workshops (AURIN, Alveo virtual laboratory, Australian Data Archive, Trove/National Library of Australia).

Partnerships with eResearch colleagues at University of Wollongong and Macquarie University to deliver workshops for social science researchers and research support staff from IT, the Library and Research Office.

A partnership with University of Melbourne and Griffith University on the Humanities, Arts and Social Sciences data enhanced virtual lab project (rebranded as “Tinker”) to establish a data curation framework and enable uptake of Jupyter Notebook for data handling and processing.

A partnership with ARDC (Australian Research Data Commons) to launch a round of national events aimed at accelerating data skills training.

The more technology intensive learning and research become, the more important it is that knowledge workers, researchers and educators build awareness of digital platforms and networked capabilities. Data processing and data handling practices need to be extended and strengthened.

With the aim of helping researchers make the most of the powerful AARNet infrastructure available to them and in recognition of the leadership role library, information technology and research support professionals are taking and how that plays into critical skills development in the research community, AARNet’s eResearch team was involved in a number of collaborative projects in 2018, including:

**TRAINING THE TRAINERS IN DATA AND DIGITAL SKILLS**
DEVELOPING SERVICES TO MEET THE NEEDS OF OUR CUSTOMERS

Although AARNet’s primary focus continues to be on the provision of network and other telecommunications services, we are increasing our focus on developing services and solutions that leverage the network to enable seamless collaboration, data flow and mobility for the research and education sector. Our portfolio of services continues to expand and includes consulting, collaboration, storage, cloud and security services.

NETWORK SERVICES

In 2018, we completed migrations to AARNet4 for all shareholders and the majority of non-shareholder customers and for the first time offered 100Gbps customer connections for general institution Internet traffic. We continue to work with customer eResearch and IT teams to help researchers make the most of AARNet’s powerful network infrastructure.

Take-up of AARNet4 VPI (Layer-2 and Layer-3 virtual private network) services grew by 60% this year, in step with customers migrating more services to the cloud. AARNet's Architecture and Applications team continues to explore opportunities and requests by our customers for partnerships with leading cloud technology companies. Our goal is to facilitate access to services and drive cost efficient initiatives for the benefit of research and education.
CLOUDSTOR
CloudStor is a research data storage and sharing service designed and built by AARNet to support data-intensive research collaborations. It is an on-net service for AARNet-connected institutions, providing individual researchers and staff with personal allocations of one terabyte free storage, with larger group allocations available on request. CloudStor storage is located in Australia, avoiding data sovereignty issues, and is currently connected to the AARNet backbone at 40Gbps with plans to upgrade this to 100Gbps for rapid and convenient access.

CloudStor maintained strong growth with over 61,588 unique user accounts logged by the end of 2018; up 38% from the end of 2017. The service is used by shareholders and other customers to share data with their collaborators in the research and education community, industry and government. A number of new features were launched in 2018, including OnlyOffice collaborative online document editing, the DICOM medical image viewer, a 3D object viewer, the JSmol protein viewer, audio playback, the SWAN (Service for Web-Based ANalysis) Jupyter Notebooks app, and increased storage and compute capacity aimed at improving the service experience and enhancing user collaboration.

The deployment of a new CloudStor node at the NCI (National Computational Infrastructure) is complete and is expected to go live in Q1 2019, along with an interconnect to be implemented to assist HPC (High Performance Computing) users with accessing their CloudStor data. As CloudStor grows AARNet is focused on continually developing and extending CloudStor to meet current and future needs of the research sector.

ZOOM
Our partnership with Zoom, to deliver cloud-based video conferencing to the sector, is flourishing. Use of the Zoom service experienced strong month-on-month growth in 2018, reaching over 100,000 users by the end of the year, up more than double the previous year. There were almost half a million meetings held using Zoom in 2018, also more than double 2017 numbers. The number of monthly Zoom meeting minutes peaked in August at over 10 million minutes. Each month in 2018 approximately 4,000 new users signed on, and a total of 82 customers, including universities, K-12 schools and cultural institutions, are now Zoom subscribers. Great performance and an intuitive user interface are key contributors to the rapid uptake of the Zoom video conferencing service.
By the end of 2018, eduroamAMU logged 435,790 Australian and 148,286 international visitors to the campuses of 58 Australian universities. CSIRO and other AARNET customers. Eduroam was available at 87 locations around Australia including university campuses and various hospitals, schools, airports and campuses. Local councils are seeking to partner with AARNET to deploy more eduromp hotspots in university cities around the country.

EXPANDING EDUROM IN ASIA

The world of research and education networks is a global community that thrives on collaboration. This collaborative spirit is demonstrated by initiatives such as the eduroam Asia project. The project saw research and education networks join forces to extend the eduroam (education roaming) service to countries in Asia with limited or no access to eduroam via an innovative train-the-trainer workshop program. More than 30 people attended a workshop held in New Zealand in August 2018 to train local NRENs to deploy eduroam in Afghanistan, Bangladesh, Cambodia, Laos, and Vietnam. The project was led by AARNET in collaboration with KITI* + JNU (Korea), REANN (New Zealand), SingAPEN (Singapore), and TIEIPPCC, with funding provided by the European Union.

MANAGED SERVICES

In response to customers expressing interest in AARNET providing managed security services, AARNET consulted with shareholders during 2018 to scope the requirements and feasibility of AARNET providing a Security Operations Centre (SOC) as a shared service for the sector. As part of the evaluation process, a pilot with a small group of shareholders will be conducted in the first half of 2019.

Work to unify AARNET’s Network Operations Centre (which supports the network) and Service Desk (which supports network products such as CloudStor, eduroam, Zoom and Panopto) progressed this year and is expected to conclude in early 2019. An internal review was undertaken to ensure that customer and staff needs are balanced in bringing these two groups together, and that appropriate staffing and reporting is developed to support the functions.

ENTERPRISE SERVICES

The Enterprise Services team provides highly valued professional and technical consulting services to assist with the provision of campus information technology across the research and education sector. The group experienced its fifth consecutive year of strong growth, delivering assignments to both shareholder and non-shareholder customers. The Enterprise Services team focused its development efforts on the operation and further refinement of consulting and engineering services directly to customers and the development of campus network managed services (co-creating and developing with customers, and in parallel designing the multi-tiered service people, processes and platforms to support them).

The team delivered a wide range of projects for customers in 2018, including comprehensive reviews of campus information communications infrastructure, services and operations; network security reviews; advisories for the selection of next-generation firewall technologies; firewall upgrades; multi-campus eduroam upgrades; network storage architecture design; and onboarding. WAN stabilisation and the application of Quality of Service parameters for Fiji National University’s 30 sites.

SOFTWARE DRIVEN SERVICE INNOVATION

With software development fundamental to providing innovative services for our customers, AARNET supported a number of R&E community software initiatives in 2018.

The partnership between AARNET and CERN established in 2017 continued to support the development of the EOS NextGen software framework used by AARNET for CloudStor and a range of other storage and data software projects, such as SWAN (Service for Web-Based Analysis). We also continued our support for the Commons Conservancy, a foundation to preserve open source software developed by the NREN community, such as FileSender (Australian Research Data Commons) and EduVPN. Our partnership and the development of the ownCloud Foundation was formally announced in August 2018. The ownCloud Foundation has been formed to accelerate the global development, distribution and adoption of the ownCloud platform (another component of the CloudStor service). AARNET also participated in the development of a “synch and share stores as research infrastructures” plan with CERN, CEANT, ownCloud and the European Commission’s Joint Research Centre, and in a research in storage and security group (hosted by SWITCH in Switzerland).

We have also undertaken collaborative projects with the Australian eResearch community this year, including with ARDC (Australian Research Data Commons) to integrate CloudStor with the Nectar (National eResearch Collaboration Tools and Resources) Cloud compute services; and with Western Sydney University and Intersect Australia to develop an update (v1.2) to the CloudStor Collections plugin.

DIGITAL TRANSFORMATION

The first phase of AARNET’s digital transformation project for automating and rationalising business processes was complete by the close of 2018. During this phase, the Software Development team delivered online customer-facing portals for ordering and enrolling in the services provided by CloudStor and other cloud providers. They also developed an internal web portal for simplifying and automating elements of network services provisioning. The next phase of the project aims to automate aspects of the operation of network and is now underway.
 Throughout 2018, AARNet continued to evolve and optimise our organisation through the development of and commitment to our people. During 2018 our team grew from 106 to 124 and we continued to expand our Product Development, Cyber Security and Infrastructure Development teams. Significantly, during 2018 AARNet focused on four key areas – Diversity, AARNet Values, Staff Training, and Recruitment, and developed to a high level our offering in these important areas.

**DIVERSITY**
AARNet recognises the value of a diverse and skilled workforce and is committed to creating and maintaining an inclusive and collaborative workplace culture that will provide sustainability for AARNet into the future. We are committed to embracing the diverse backgrounds, experiences and perspectives of our employees to provide excellent service to our equally diverse shareholders and customers through an increasingly innovative and contemporary culture. Within the ever-evolving landscape of Diversity, AARNet has taken a leading role within the NREN community, in implementing a strong and meaningful approach through the four pillars of Policy; Diversity Council; Diversity Analytics; and support from the AARNet Board. Additionally, AARNet has put in place a full-service Employee Assistance Programme, to assist AARNet employees and their families in times of need.

**AARNET VALUES**
2018 saw the introduction and embedding of the AARNET Values: One Team; Creativity; Trust. The AARNET Values were developed collaboratively through an extensive consultation process involving all employees and rolled out to all employees through an Australia wide series of CEO roadshows and information sessions. Importantly, the AARNET Values have been embedded into our recruitment, training, and performance management processes. The AARNET Values have proved to be an important segment of employee engagement, as particularly evidenced through the wonderfully interactive sessions with broadcaster James O’Loughlin and body language expert Dr Louise Mahler at the All Staff Meeting at the conclusion of 2018.
employee training & development

under the guidance of our human resources department, aarNet has made a significant commitment to employee training and development with key focus on the areas of presentation, public speaking skills, corporate and personal resilience, team leadership skills, and communication & influencing skills. this work will continue into 2019 and beyond. additionally, aarNet has also taken a global leadership role within our NREN community and developed a proposal for 2-year leadership training programme for the global NREN group. the programme covers various areas of professional leadership and development as well as having a strategic technical focus on cyber. we currently continue to work on refining this proposal with the global NREN group, with a view to a pilot programme in 2020.

recruitment

during 2018, aarNet significantly strengthened our recruitment practices, with an increased focus on recruiting for workplace cultural development as well as technical skills. additionally, we implemented new compliance practices, which are measurable and robust and peer with best practice models throughout the world. we continue to develop these areas and 2019 will see significant development of our recruitment strategies, to ensure that aarNet continues to attract the best and the brightest.

aarNet staff as at end 2018, total: 124

international engagement

aarNet continued to host and overseas content production for the In The Field website (inthefieldstories.net), a global collaboration for sharing impact stories and promoting the value of research and education networks worldwide. by the end of the year, there were 2018 stories published on the site, covering a wide range of topics in the sciences and humanities and featuring 89 networks.

aarNet staff continued to collaborate with their global peers and were involved in international projects, working groups, conferences and forums for the benefit of the research and education community. these included asia Pacific Advanced Network (APAN) meetings, PITA Conference, TeIN™, Global Network Architecture Group and GLIF, NREN Forum and TNC2018, eResearch NZ, Supercomputing 2018, CS3 Workshop, RDA 12th Plenary.

in 2018, aarNet joined the Research Data Alliance, an international organisation launched in 2013 by the European Commission, the united states National Science Foundation and National Institute of Standards and Technology, and the Australian Government’s Department of Innovation with the goal of building the social and technical infrastructure to enable open sharing of data.

aarNet cycle enthusiasts took up the challenge to ride from Armidale to South West Rocks, NSW, in the Tour de Rocks 2018, a 300km cycle ride over 3 days to raise funds for cancer.

N.S.W. 60   V.C. 23   Qld. 19   W.A. 13   A.C.T. 9   S.A. 15   T.A.S. 1   Netherlands 1

ARRNet supports STEM (Science, Technology, Engineering and Maths) programs in our community as part of our commitment to inspiring young people to pursue tertiary STEM studies. for the fourth year running, in addition to providing network connectivity and streaming, aarNet staff participated in judging the FIRST® Robotics Competition hosted by Macquarie University. teams from a number of universities and schools connected to aarNet took part.

aarNet also volunteered as judges for the National Young Mentoring Experience (AIME) by providing the high-speed internet connectivity to enable open sharing of data.

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THE ORGANISATION

AARNet Pty Ltd [ACN 084 540 518] is the not-for-profit company that operates the AARNet network, Australia’s national research and education network, also known as an NREN.

Shares in AARNet Pty Ltd (AARNet) are held by 38 Australian Universities and the CSIRO as listed on page 37. AARNet is a licensed Australian telecommunications carrier (#61 under the Telecommunications Act 1997 Cth).

The Chief Executive Officer is charged with the efficient and cost-effective operation of the company and reports to the Board of Directors, as listed on page 37.

THE AARNET BOARD OF DIRECTORS

The Board of Directors is responsible for the overall direction and management of AARNet.

For more than 28 years, AARNet and its predecessor have shared and exchanged expertise with shareholders and customers in many ways, supporting national and international collaboration and innovation in networking and associated services for research and education.

AARNet has been effective in making representations to government on policy, legislation, strategy and programs to improve the telecommunications facilities and services available not only to the education and research sector, but to all Australians.

THE AARNET ADVISORY COMMITTEE

The AARNet Advisory Committee (AAC) represents the interests of the members and is a source of advice on policy and business matters. Regional Network Organisations, which are generally state based, elect one representative to the AAC. Members of the AAC are listed on page 37.

LIST OF SHAREHOLDERS

Australian National University
Commonwealth Scientific and Industrial Research Organisation
University of Canberra
Charles Sturt University
Macquarie University
Southern Cross University
The Australian Catholic University
University of New England
University of New South Wales
University of Newcastle
University of Sydney
University of Technology, Sydney
Western Sydney University
University of Wollongong
Charles Darwin University
Rond University
Central Queensland University
Griffith University
James Cook University
Queensland University of Technology
University of Queensland
University of Southern Queensland
University of the Sunshine Coast
Flinders University
University of Adelaide
University of South Australia
University of Tasmania
Deakin University
La Trobe University
Monash University
RMIT University
Swinburne University of Technology
The University of Melbourne
Federation University Australia

Victoria University
Curtin University
Edith Cowan University
Murdoch University
The University of Western Australia

BOARD OF DIRECTORS

Chairman: Emeritus Professor Gerard Sutton AO*
Executive Director: Mr Chris Hancock (CEO)
Mr Chris Bridge (until 27 June 2018)
Dr Christine Burns
Professor Annabelle Duncan
Professor John Dewar (joined 23 March 2018)
Mr Rob Fitzpatrick*
Mr Jeff Murray
Mr John Rohan*
Professor Deborah Terry
Emeritus Professor Mark Wainwright AM*
Dr David Williams
*Denotes Independent Director

AARNET ADVISORY COMMITTEE

Chairman: Mr Jeff Murray (University of Tasmania)
CEO AARNet: Mr Chris Hancock
Mr Malcolm Caldwell (Charles Darwin University)
Mr David Formica (University of Canberra)
Mr Vito Forte (Edith Cowan University) (joined November 2018)
Mr Michael Grant (Murdoch University) (until October 2018)
Mr Tim Mannes (Charles Sturt University)
Ms Bev Wright (University of Adelaide)
Mr Tom Minchin (CSIRO)
Mr Scott Sorley (University of Southern Queensland)
Mr Zoran Sugarevski (Victoria University)
2018 was an exciting year for AARNet. Here’s a closer look at some of the discoveries and success stories in the research and education community enabled by our powerful network and collaboration services.

To read more stories, go to news.aarnet.edu.au
At the University of Melbourne’s Networked Society Institute researchers are leveraging the AARNet network for developing and testing virtual reality technologies for health and medical applications.

After decades of experimentation, virtual reality (VR) technologies that have the power to hack our senses of sight, hearing and feeling are beginning to transform many aspects of the way we live and work. At the University of Melbourne’s Networked Society Institute (NSI), a small team has spent three years focusing on health and medical applications of Virtual Reality (VR) technology. Ken Clarke, Academic Specialist, Electrical and Electronic Engineering, explains that VR’s transformative ability makes it particularly well-suited for health research.

“VR is a flexible platform that gives us the ability to take people anywhere and to any time. It’s very powerful because you can take people out of their everyday existence.”

One of the group’s projects, Music Therapy in Virtual Environments, has developed a proof-of-concept online virtual reality platform that brings quadriplegic patients together for virtual singing therapy sessions. Previous clinical research demonstrated that group singing helped people with quadriplegia to breathe better, speak louder and make social connections. But many of the patients found it difficult to get to the rehab centre for sessions.

VR makes it possible for participants to receive music therapy in their own homes. Patients wear a virtual reality headset and sing with therapist and researcher Dr Jeanette Tamplin in virtual settings such as a campfire, or on stage in front of an audience.

“We’ve had a really good reaction from quadriplegic clients we have trialled the VR therapy with,” Clarke said.

“On the whole they are very positive about escaping their home existence and joining a choir. As well as serving a rehabilitation purpose, it’s enjoyable and sociable and helps them live longer and more healthily.”

Any network latency can cause problems when attempting to link geographically separated users in a virtual world. It can mean users don’t see and hear the same thing at the same time, making real-time group singing impossible.

As such, NSI take advantage of a dedicated gigabit connection to the AARNet network for developing and testing their VR technologies and carrying out user trials. “AARNet connectivity allows us to pilot and further develop our VR world with users in diverse locations across Victoria from our location at the University of Melbourne’s Parkville campus,” Clarke said.
DESIGNING TECH SOLUTIONS FOR TOUGH HEALTH CHALLENGES

At the Australian Centre for Health Innovation in Melbourne, a simulated hospital leverages the ultra-high speed and reliability of the AARNet network to test and trial new and emerging technologies.

Connected to Australia’s universities and hospitals via AARNet, the Australian Centre for Health Innovation (CHI) is a faithful replica of a hospital overlaid with a medical-grade IT testbed. It provides the ideal environment for healthcare solution providers to test and trial products that tackle the toughest health challenges.

CHI has helped vendors bring an array of innovations to market, explains Director of Technology, Frank Smolenaers. One project involved designing and testing telehealth solutions to link regional GPs with metropolitan specialists.

“Together with an Australian telco, we modelled one room in our facility as the rural GP with the patient using a DSL link, and in the other room we used our AARNet link as the ‘corporate hospital’ link to a metropolitan specialist.”

With the two rooms separated acoustically, CHI conducted a number of telehealth consults using real GPs and specialists along with actors as patients.

“By observing and improving, we had a whole cycle of testing and development and we were able to help the company produce two levels of tele-health solutions; one for the GP practice and the other for the specialist. Our AARNet link made it all possible.”

CHI has also taken its demonstrations on the road to conferences and hospitals around the country.

“With the formidable AARNet connection we have, I knew there wouldn’t be an issue on our end as far as speed and throughput, and the whole experience would be optimised.”

As well as a simulation of a physical hospital environment, CHI boasts the IT infrastructure found in a real hospital, including specifics such as firewalls, Active Directory for authentication and mail servers.

A medical grade IT testbed – called the Digital Health Design Laboratory – helps show organisations what’s possible when it comes to technology by allowing the customer to immerse themselves in the new technology and workflows in the simulated hospital environment.

“Many organisations lack technology maturity in certain areas. CHI can show them what’s possible and, if they can’t come in person, we can remote them in and take them on a tour and show them the technology wherever they might be. We use AARNet to optimize that remote experience,” said Mr Smolenaers.
SCALABLE CONNECTIVITY ENABLES A CLOUD-FIRST STRATEGY

For Presbyterian Ladies’ College Sydney and Armidale, scalable AARNet connectivity has opened the door to ultra-fast teaching and learning experiences and highly available infrastructure. When CIO David Savill arrived at the school, the Internet was slow, and there was lots of aging in-house equipment that was time-consuming and expensive to maintain.

Then he heard how scalable a connection from AARNet would be and formulated a plan that would allow him to radically overhaul PLC’s infrastructure, moving all the school’s compute and storage to the datacentre and working with AARNet to architect and implement diverse connectivity across metropolitan Sydney.

“Our 10G connection from AARNet cost just a small amount more than 1G; when I realised this, I was blown away by how we could scale, and it opened up so many possibilities.”

Savill and his team worked with AARNet to architect a solution involving building a 1.7km tail to the school, designing connectivity to the Equinix datacentre, and building dark fibre around the east of Sydney to provide complete diversity.

For Savill, the benefits of the new solution are clear. Both the Sydney and Armidale campuses are now on the one network and are able to take advantages of economies of scale. User data is secure, replicated in real-time and with all systems backed up. Workloads can be moved between sites with little or no downtime allowing the school to mitigate significant events.

The school has avoided power and cooling infrastructure upgrade costs, as well as time spent managing in-house servers. It also provides quick and cheap connectivity to all of the major public cloud providers and other networks.

Crucially, fast and reliable connections mean the school’s users can rely on live access to services for teaching and learning.

“Connectivity is now as fast as our internal network. Speed is the new normal and there’s a lot more confidence in the classroom to deliver things live.

“We’re really happy; it just works. I don’t think I could have done this without AARNet, and I don’t think I could have had this experience with any other telco.”

Image courtesy PLC Sydney.
Handwriting recognition is being used to transform the Australian National University (ANU) library’s Sydney Stock Exchange collection, which sheds light on Australia’s economic and social past, into data that will be stored in CloudStor and made available to researchers and the community via the AARNet network.

An image facsimile of the paper record is stored in the university’s digital repository and, alongside this, a cross-disciplinary team is working to convert the handwritten text into digital text and data that will be uploaded to AARNet’s CloudStor.

University Librarian Roxanne Missingham says that with access to the information in data format, researchers will be able to more easily access, interrogate, categorise and manipulate the data to suit their needs.

“The Sydney Stock Exchange records tell interesting stories beyond economics; researchers can look at how local communities grow based on the amount of coal sold, the impact on social welfare, and on migration within the state; there are so many possibilities for cross-disciplinary research. “But really important research like this gets lost unless we take the opportunity to make the information fully accessible.”

A CROSS-DISCIPLINARY TEAM IS WORKING TO CONVERT THE HANDWRITTEN TEXT INTO DIGITAL TEXT AND DATA THAT WILL BE UPLOADED TO AARNET’S CLOUDSTOR.

“AARNet underpins the connectivity and storage for the Sydney Stock Exchange project, providing high-bandwidth connectivity that supports transfer of large volumes of data between ANU library, CloudStor, and researchers across the globe.

Missingham explains that CloudStor is ideally suited to storing research data because of its ease-of-use and efficient workflows.

“I’m not a technologist but from my point of view, everything happens by magic with CloudStor. It’s extremely simple in terms of logging in, the messaging is great, and it’s hyper-efficient.”

But beyond the network and storage, Missingham says that AARNet’s role as a technology expert is just as crucial to the project’s success.

“Our workflows and the way we do things needs to be quite different. We’re dealing with a lot of new technologies and processes associated with liberating the information held within the collection.

“Doing this together with AARNet is a great partnership because of its enormous technical expertise. AARNet plays a wonderful role as an interpreter between technology, researchers and collections, and this is helping us find new ways to provide better access to resources.”

At the ANU library a project is underway to unlock the content held within 50 years’ worth of paper-based stock exchange records using AARNet.

TRANSFORMING PAPER RECORDS INTO RESEARCH DATA
AARNet connectivity gives us more power to do more sophisticated analysis and makes our data more accurate.

AARNet collaborated with the New South Wales Office of Environment and Heritage to solve the problem researchers faced around access to large volumes of imagery and data from the Copernicus satellite.

A customised AARNet network solution connecting the New South Wales Office of Environment and Heritage (OEH) and the Copernicus Australasia Regional Data Hub (the Hub) located at the National Computational Infrastructure (NCI) in Canberra means that OEH researchers now have the fast and reliable access they need to satellite imagery and geospatial data.

The Hub facilitates the flow and access of data from the European Union’s Copernicus programme. Data, including the latest images of the Australian landscape beamed down to Earth from the constellation of European Sentinel satellites, are made available to OEH researchers via the Hub.

The researchers use these data for remote sensing analysis, mapping and modelling to generate information about vegetation and water patterns and changes to the environment. This information feeds into government policy making and compliance, and helps land owners manage stock and tree cover, as well as their interactions with wildlife, native vegetation and wetlands.

OEH Remote Sensing Scientist and Programmer Tony Gill said the OEH sought expertise from AARNet when the network speed and capacity offered by commercial Internet service providers proved to be unreliable for the daily transfer of thousands of high-resolution images required for their work.

AARNet engineers worked with Gill and the OEH IT team to develop the solution, which included the deployment of a new customized capability for accessing large data stores at the NCI and technical expertise to augment existing OEH IT resources.

A low latency scalable 1 Gigabit per second AARNet connection coupled with the implementation of Science DMZ architecture at the institution border — to separate the big data transfers from day-to-day business traffic — ensures reliable access to exponential volumes of Sentinel imagery for the scientists at the OEH.

“When we were reliant on commercial networks for transferring data from the Hub at NCI, the download speed was very slow. We had to be very judicious in the choice of imagery we used for analysis and this was impacting the accuracy of our modelling,” said Gill.

“AARNet engineers worked with Gill and the OEH IT team to develop the solution, which included the deployment of a new customized capability for accessing large data stores at the NCI and technical expertise to augment existing OEH IT resources.

A low latency scalable 1 Gigabit per second AARNet connection coupled with the implementation of Science DMZ architecture at the institution border — to separate the big data transfers from day-to-day business traffic — ensures reliable access to exponential volumes of Sentinel imagery for the scientists at the OEH.

“What used to take a week to download in an unreliable fashion, now takes 15 minutes. We can also now retrieve every image captured for NSW within a couple of days of being acquired instead of only being able to manage a small portion,” says Gill. “AARNet connectivity gives us more power to do more sophisticated analysis and makes our data more accurate.”

Images courtesy NSW Office of Environment and Heritage
ARTEFACTS ALIVE! VIRTUAL TOURS IN THE CLASSROOM

AARNet is bringing learning from the museum to the classroom with seamless video conferencing, giving remote students a chance to become historians, scientists and movie producers.

Museums are repositories of history and help keep a physical connection to our past. For students, it’s an opportunity to learn about humanity beyond a textbook. Students get to walk through halls of real history, learning about the people, places and artefacts that shaped humanity, with the help of teachers and museum staff. It builds a visceral connection to the past.

However, distance and the challenges of organising school trips have always limited student access to museums. Now, museums are being brought to schools across Australia with the help of AARNet’s high-speed broadband and Zoom video conferencing service.

During 2018, the National Museum of Australia in Canberra brought its Rome: City and Empire exhibit to schools around Australia via virtual tours. The exhibit featured some of the British Museum’s most important Roman artefacts and students experienced them first-hand without leaving their classrooms.

With video conferencing, Digital Programs Coordinator Robert Bunzli walked a classroom through an Ancient Roman household, showed students the night sky for a lesson in Aboriginal astronomy, and delved into Australia’s complex colonial history with older students, showing them real pieces of Australia’s past, to help them think about the nature of history and who records it.

Meanwhile, The Australian Museum in Sydney is engaging more than 10,000 students a year with science education. Manager of Outreach and Discovery, Karen Player, brings the science of geology, microbiology and fossil collection to classrooms that don’t have the ability or the resources to travel to The Australian Museum themselves. The program helps bring science to students in regional schools, some of which have fewer than ten students, as well as children studying in hospital wards.

Programs are built to teach students about careers in STEM, including experimental work they can do with their teachers in class. One example is the citizen science program Frog ID, which allows students to record their local frogs with a phone app and contribute to real science, monitoring Australia’s frog populations.

Video conferencing also helps promote students’ creative side. The Australian Centre for the Moving Image (ACMI) in Melbourne brings their programs to schools through Zoom video conferencing.

Meet the Makers brought movie directors and producers, as well as animators and video game designers, to the classroom in 2018 to give students insider knowledge about the screen industry. Students learnt about careers in film, television and video gaming, received information and inspiration to create their own projects for the student moving picture competition Screen It.

Museums are bringing a new interactive dimension to classwork, thanks to AARNet. Low-latency, dark-fibre connections between museums and schools means video conferences run seamlessly, without streaming delays affecting immersion for students or creating a barrier for learning. High-speed connectivity engages students who have been limited by distance in the past, ensuring they get the same quality educational experiences as everyone else.
Australia’s environment is set to change rapidly over the next few decades. Temperatures are increasing, and more extreme weather events are predicted. This will impact every part of Australian life, from our cities, to our water supply and our environment. Because of this, it’s vital that Australia prepares for its future climate.

Professor Jason Evans of the Climate Change Research Centre and the ARC Centre of Excellence in Climate Extremes has developed a new climate model that predicts changing weather patterns with greater resolution. Professor Evans’ model predicts weather patterns down to 50km² across Australia, even to a resolution of 10km² in Australia’s heavily populated south east.

Climate models are designed to predict climate on a macro scale – over states and entire countries. What these simulations leave out is the more detailed picture of how weather changes locally. Vegetation, nearby water bodies, buildings and the topography of the land can all affect rainfall rates and temperature, leading to microclimates. By mapping these microclimates, Professor Evans’ research is being used by industries including construction, insurance and city planning to plan their water future.

Climate simulations require huge amounts of data processing. Interactions between particles micrometres in length affect kilometre-long cloud movements across the entire planet. To get a truly accurate dynamic model, all this data needs to be considered.

Professor Evans’ research requires large amounts of data output from Pawsey Supercomputing Centre and National Computational Infrastructure (NCI) to be transferred across the country and to his team at the University of New South Wales (UNSW). The data requires real-time streaming to allow simulations to run. To make this possible, AARNet’s advanced research network connects all three institutions for high bandwidth data transfer.

“AARNet has been vital to this research. Achieving the workflow required terabytes of data to be transferred between NCI, Pawsey and UNSW on a regular basis. Without the high bandwidth available through AARNet this research could not have been done.”

The work isn’t finished, however. Professor Evans’ research will now focus on predicting the effects of multiple extreme weather events within a short period. The model’s resolution will also be increased, giving even greater detail to Australia’s weather systems. These future simulations will require more supercomputing power and faster connection speeds from supercomputing centres to researchers like Professor Evans, a mission Australia can accomplish with the help of AARNet.
Dozens of researchers from the Australian Research Council Centre of Excellence for Gravitational Wave Discovery (OzGrav) are part of an international team of scientists making significant discoveries in the emerging field of gravitational-wave astronomy.

Gravitational waves carry unique information about their dramatic origins and the nature of gravity. In 2015, scientists detected gravitational waves for the first time and concluded they were produced during the final moments of the merger of two black holes to produce a single, more massive spinning black hole. This collision of two black holes confirmed predictions of Albert Einstein’s 1915 general theory of relativity.

In 2018, the scientists detected the most massive binary black hole merger yet witnessed in the universe. The black hole that resulted from this cataclysmic event is more than 80 times as massive as our Sun. The discovery – along with evidence of nine other black hole mergers – came just over one year since scientists announced they had witnessed, for the first time, the violent death spiral of two dense neutron stars via gravitational waves.

Scientists use the extremely sensitive detectors LIGO (two interferometers in the states of Louisiana and Washington, USA) and VIRGO (an interferometer in Cascina, Italy) to survey space for gravitational waves arriving at the earth from a cataclysmic event in the distant universe. Detection data streams are analysed using high performance computing at the LIGO and VIRGO nodes. Some of this data is transferred to international collaborators over research and education networks for further analysis and discovery, including over AARNet to the OzGrav nodes at partner institutions in Australia.

OzGrav is hosted at Swinburne University in partnership with the Australian National University, Monash University, University of Adelaide, University of Melbourne, University of Western Australia, CSIRO and the Australian Astronomical Observatory and collaborators in Europe and the USA.

Colm Talbot, an OzGrav scientist from Monash University says gravitational wave astronomy requires a global approach. “By studying black hole collisions and other wave-making events we act as cosmos archaeologists to understand how the universe works. From detecting events through to analysis and discovery, working together nationally and globally improves the quality of individual tasks and leads to better research outcomes,” he said.

AARNet provides the reliable, scalable and secure high-speed network required for moving data between OzGrav scientists and their international collaborators to support gravitational wave research.
“WE ARE CONFIDENT THAT WE ARE CONTINUING TO CREATE GREAT VALUE FOR OUR SHAREHOLDERS AND CUSTOMERS AND WE LOOK FORWARD TO DELIVERING FURTHER SUCCESS IN THE YEAR AHEAD.”

Gerard Sutton AO, Chair AARNet Board
**DIRECTORS’ REPORT**

Your Directors present their report on the Company, AARNet Pty Limited (“AARNet”), for the year ended 31 December 2018.

The following persons were Directors of AARNet during the whole of the financial year and up to the date of this report:

**Emeritus Professor Gerard Sutton AO**
Chair of the Board and Chair of the Nomination and Remuneration Committee

**Dr Christine Burns**
Professor Annabelle Duncan

**Mr Jeff Murray**
Member of the Audit, Finance and Risk Committee

**Mr Chris Hancock**
Chair Executive Officer

**Mr Jeff Murray**
Deputy Chair of the Board, Chair of the Audit, Finance and Risk Committee and member of the Nomination and Remuneration Committee

**Emeritus Professor Mark Wainwright AM**
Member of the Audit, Finance and Risk Committee and the Nomination and Remuneration Committee

**Dr David Williams**

Mr Chris Bridge was a director from the commencement of the financial year until his resignation on 27 June 2018.

Professor John Dewar was appointed a director on 23 March 2018, and remains a director at the date of this report.

**PRINCIPAL ACTIVITIES**

AARNet is not for profit, proprietary company in which 38 Australian universities and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) have an equal shareholding.

AARNet's principal activity is the provision of internet and advanced telecommunications and network services to its shareholders (“Members”) and to other relevant organisations. Services are provided in accordance with the AARNet Access Policy in order that Members and other customers may:

a) use AARNet's internet and other telecommunications facilities and services to provide educational and research activities; and
b) collaborate with other parties (nationally and internationally) in furtherance of research and education objectives.

**OTHER ACTIVITIES**

In addition, AARNet:

a) facilitates the construction of connections (fibre tail) to the AARNet backbone and between campuses and other locations to facilitate services for Members and customers;

b) provides applications and services which operate across the AARNet network supporting education and research activities;

c) assists Members and other customers with network design, engineering and consulting services to optimise the end-to-end performance, robustness and resiliency of campus, data centre and cloud networks via the AARNet4 network;

d) participates in the design and deployment of advanced network infrastructure in partnership with research networks in Australia and internationally, to develop national and global research and education networks; and

e) makes representations to all levels of government on policy, legislation and programs to improve the telecommunications facilities and services available to its Members and other customers.

**DIVIDENDS**

AARNet’s constitution prohibits the payment of dividends or other distributions to its shareholders. Accordingly, no dividends have been paid, declared or recommended either during the financial year or in the period since that year ended (2017: nil).

**REVIEW OF OPERATIONS**

**Traffic Growth and Network Performance**

For over ten years, AARNet has experienced very significant growth in the traffic carried across the network. For the five years up to and including 2018, traffic delivered to AARNet’s Members has grown at an average compound rate of 33.0%. Even with this significant growth in traffic, the amounts paid by Members for the carriage of this traffic, in the form of subscriptions, access and traffic charges, grew by an average of only 0.5% per annum during the same five-year period.

AARNet also provides services for a range of non-member customers across the research and education sector. Including traffic delivered to these organisations, traffic delivered has grown at an average compound rate of 57.2% over the five years to 2018.

Even with the growth in traffic across the network, AARNet again provided high levels of network performance and availability. For 2018 average network availability was 99.92% which was slightly lower than the level achieved in 2017 (99.95%). The reduction was due to prolonged outages experienced on a submarine cable between Australia and Singapore operated by a third party, reducing the effect of those outages the level of availability would have been 99.95%.

**Network Expansion**

During 2018 AARNet continued to invest to upgrade the capacity of the AARNet network and to expand the geographic reach of the network’s fibre footprint.

Overall spending on communication assets (including network infrastructure and equipment) was $27,343,926 during the year which was substantially higher than the $13,974,599 invested in 2017 (refer to note 20 to the financial statements).

The increased investment reflected AARNet’s participation in two significant submarine cable ventures (Indigo and JGA) as well as continued investment in AARNet’s domestic fibre footprint.

**Indigo Consortium**

AARNet is a member of the Indigo consortium which is currently constructing a submarine optic fibre cable to provide capacity between Sydney and Perth as well as Perth to Singapore.

Indigo is scheduled to commence service during 2019 and, when it is commissioned, will provide AARNet with significantly enhanced capacity to connect with research networks in Asia as well as improved capacity and network resilience between the east and west coast of Australia.

**JGA South**

AARNet is also a member of the JGA South consortium laying fibre between Sydney and Guam. Guam is a significant hub for telecommunications services and by participating in the construction and ownership of fibre between Sydney and Guam AARNet will gain high capacity bandwidth able to on-connect to research and education networks in Asia (particularly into North Asia).

We expect JGA to enter service during 2019.

**Subscriptions and Telecommunications Revenues**

AARNet’s Members pay subscription and related fees for connection to the network and carriage of data across the network. To research and education facilities in Australia, international research and education networks and to the general internet.

During 2018 Members’ subscription and related charges were only 0.5% higher than in 2017 despite the growth in Members’ traffic discussed above. Members’ subscriptions increased for the first time in 2018 were charges for Third Party Users, agreed to as part of the latest AARNet Access Agreement between Members and AARNet. Without these charges, the growth in subscriptions would have been less than 0.2%.

**2018** | **2017** | **Increase**
---|---|---
Members: Subscription, Traffic and Access | $40,593,377 | $40,399,463 | $0.5%
Non-Member: Subscription, Traffic and Access | $18,153,717 | $16,097,666 | 12.8%
Other Services | $6,935,079 | $5,911,775 | 17.7%
Telecommunications Revenue | $75,681,973 | $70,398,902 | 7.5%

Non-Member subscriptions continued to grow strongly with 2018 revenues up 2.8% on the previous year. This reflects continued growth in the number of non-member customers connected to the network.

**Other Services**

AARNet also provides a range of other services to Members and other customers. Broadly, these services fall into two categories:

i) Transmission services providing point-to-point capacity: these enable Members and customers to link together geographically diverse campuses, research centres and remote research instruments; or to provide dedicated high-speed capacity between user facilities and third party data centres; and

ii) Above the network services which directly support the delivery of education and research outcomes (including Zoom, a video conferencing/meeting service offered in conjunction with Zoom Inc; Parapto a video recording, management and streaming service, which is used by many universities around the world as a teaching and research resource; and CloudStor, a service which is optimised for the storage and sharing of research data sets).
Revenue from these other services rose by 21.7% during 2018. AARNet’s suite of videoconferencing, video streaming and cloud storage services continue to be embraced by users across the research and education sector, and this was supplemented by continued growth in our more traditional services of transmission services and circuits.

Overall, subscriptions and service revenues increased by 7.5% during 2017.

**Infrastructure Revenues**

Infrastructure establishment fees (income from the provision of new fibre infrastructure) grew by 15.6% in 2018 reflecting the value of infrastructure projects completed and brought into service – including projects which completed in the latter part of 2017 contributing a full year’s revenue in 2018. During the year, AARNet adopted a new accounting policy for recognising revenue flowing from these establishment fees. The new policy was adopted to conform with the requirements of a new accounting standard (AASB 15 – Revenue from Contracts with Customers). AASB15 requires revenue from establishment fees to be recognised in profit or loss over a longer period than under the previous policy. Consequently, the effect of the change was to reduce establishment fee income for both 2018 and 2017 compared to what would have been applied under the previous policy. Details of the adoption of AASB15 are contained in note 29 to the financial statements.

### 2018 2017 Increase

| Infrastructure Establishment Fees | $4,742,009 | $4,210,075 | 12.6% |
| Infrastructure Construction Revenue | $1,081,169 | $1,829,763 | (36.0)% |

### Other Revenues

In addition to revenues from the provision of telecommunication services and infrastructure, AARNet also gains income from interest and dividends on invested funds. In 2018, this investment income totalled $3,125,896 (2017: $2,655,026) (see note 9 to the financial statements). In 2018, AARNet also benefited from a significant gain on foreign currency contracts held to hedge against adverse movements in exchange rates. In 2018, a gain of $3,250,943 was recognised on these contracts compared to a loss of $2,336,325 in 2017 (see further discussion below).

### Telecommunication Expenses

The largest category of operating costs, Telecommunication Expenses, was slightly higher than the costs incurred in the previous year. AARNet experienced increases in the costs of delivering new services (reflecting the growth in service income referred to earlier) but these were offset by savings in the cost of housing equipment in data centres and other premises operated by third parties.

### Employee and Administration Costs

To support increasing the number of customers plus the ongoing infrastructure build and general growth in services and revenues, AARNet added staff to its service desk, infrastructure development and eResearch support teams across 2018. Further personnel were also added to the product development and software support teams, in some cases replacing short contract terms with permanent appointments. The additional resources support the development of new products, provide support for existing services and develop and deploy systems to support and streamline service delivery and internal processes.

### Depreciation and Amortisation Charges

Depreciation and Amortisation charges, inclusive of depreciation on equipment, depreciation on infrastructure and amortisation of Indefensible Rights to Use (IRUs) totalled $18,310,012 in 2018 which was 8.9% higher than 2017 ($17,909,200). The main factor behind this increase was the movement in the relative value of the Australian Dollar against the US Dollar over the course of the year. The Australian Dollar weakened across 2018 causing the contract, but unlike, US Dollar value of the international IRUs held to invest in AARNet to increase. The decline in the Australian Dollar has impacted the value of the investment (including the unpaid portion) such that the declining dollar resulted in an increase in amortisation charges. (AARNet’s hedging instruments recorded a gain offsetting much of the additional amortisation cost – see following section).

### Finance Costs

AARNet has significant contractual commitments requiring it to make foreign currency and commodity payments (where such payments are denominated in a currency other than the Australian Dollar) for international transmission capacity (including the commitments for capacity under IRUs referred to in the previous section). These commitments, many of which extend for periods in excess of five years, are included in note 2(b) to the financial statements.

In order to hedge the exposure to exchange rate fluctuations with respect to these commitments (and other payments required in foreign currencies), AARNet arranges foreign currency purchases, purchases foreign currency options and maintains holdings of foreign currency for hedging purposes. The arrangements are discussed in note 24 to the financial statements.

Across 2018, the Australian Dollar decreased in value relative to the United States Dollar with the effect that AARNet experienced a substantial gain on its hedging positions of $3,250,943 (see note 9 to the financial statements). This gain, noted in the previous section, offset the increased amortisation of IRUs, which arose from the same movement in the Australian Dollar. The gain recorded in 2018 was partly a reversal of the loss of $2,336,325 on foreign currency contracts recorded in 2017 (see note 10 to the financial statements).

### ACCUMULATED SURPLUS AND RESERVES

In 2018 AARNet recorded a net surplus of $15,468,460 (2017: $9,524,132). In the Board’s view, it is prudent for AARNet to generate a surplus in order that investments in network capability and services may be funded without calling on Members to contribute further equity to the company. Surpluses earned by AARNet cannot (by virtue of the terms of AARNet’s constitution) be distributed to the shareholders.

Surpluses earned in prior years, aided by conservative financial management, have therefore been accumulated into significant holdings of cash and investments. In 2017 and 2018 a significant portion of these funds were invested in:

- the Indigo and JGA consortia constructing high capacity submarine fibre infrastructure (as described earlier);
- extensions and enhancements of AARNet’s own terrestrial fibre infrastructure to improve the reach, resilience and capacity of the domestic network.

These investments are expected to continue into future years. In addition, AARNet intends to use further funds to finance investments in:

- finance investments in technology to enhance the delivery of services to Members and other customers;
- supplement Members’ subscriptions and other income in future years;
- defray part of the significant financial commitments in respect of non-cancellable operating leases (principally rights to use submarine fibre cables operated by other telecommunication carriers) which, at year end, were $221.7m (refer note 23(b)) to the financial statements.

### NET ASSETS

Net assets at 31 December 2018 were $214,198,927 (2017: $199,567,835). The increase represents the surplus for 2018 plus the change in value of available-for-sale financial assets during 2018.

### SIGNIFICANT CHANGES IN THE STATE OF AFFAIRS

Except for the matters discussed under the heading “Review of Operations” there were no significant changes in the Company’s state of affairs during the financial year ended 31 December 2018.

### MATTERS SUBSEQUENT TO THE END OF THE FINANCIAL YEAR

Except for matters discussed under the heading “Review of Operations”, no other matter or circumstance has arisen since 31 December 2018 that has significantly affected or may significantly affect:

- AARNet’s operations in future financial years;
- the results of those operations in future financial years; or
- AARNet’s state of affairs in future financial years.

### LIKELY DEVELOPMENTS AND EXPECTED RESULTS OF OPERATIONS

While the rate of traffic growth has slowed over recent years, AARNet expects network traffic will continue to grow at significant levels during 2019.

In addition, substantial investment in the Indigo and JGA submarine cable systems and in AARNet’s domestic fibre network will continue during 2019. Indigo is expected to enter service in 2019 and will provide AARNet’s Members and other users with a high capacity path to South East Asia and beyond.

### ENVIRONMENTAL REGULATION

AARNet’s operations are not adversely affected by any significant environmental regulation. AARNet believes its greenhouse gas emissions are substantially below the thresholds that are subject to the reporting requirements of either the Energy Efficiency Opportunities Act 2006 and the National Greenhouse and Energy Reporting Act 2007.
INSURANCE FOR OFFICERS

During the financial year, AARNet paid a premium of $33,091 (2017: $30,274) in respect of liability insurance for the Company’s Directors and Officers. The liabilities insured against are costs and expenses that may be incurred in defending civil or criminal proceedings that may be brought against the Directors and Officers in their capacity as Directors and Officers of AARNet, and any other payments arising from liabilities incurred by the Officers in connection with such proceedings, other than where such liabilities arise out of conduct involving a willful breach of duty by the Directors or Officers or the improper use by the Directors or Officers of their position or of information to gain advantage for themselves or someone else or to cause detriment to AARNet. It is not possible to apportion the premium between amounts relating to the insurance against legal costs and those relating to other liabilities.

No known liability has arisen under these indemnities to the date of this report.

AGREEMENT TO INDEMNIFY OFFICERS

Under the terms of its Constitution, AARNet provides indemnity to persons who are, or have been, an officer or auditor of AARNet, but only to the extent permitted by law and to the extent that the officer or auditor is not indemnified by Directors and Officers’ liability insurance maintained by AARNet. The indemnity is against liability incurred by that person as an officer or auditor of AARNet to another person and for costs and expenses incurred by the officer or auditor in defending such proceedings. Separately, AARNet and each director of AARNet have entered into a Deed of Indemnity under which AARNet indemnifies each director against any liability:

a) to a third party (that is, other than to AARNet) unless the liability arises out of conduct involving a lack of good faith, and

b) for legal costs incurred in successfully defending civil or criminal proceedings or in connection with proceedings in which relief is granted under the Corporations Act 2001.

No known liability has arisen under these indemnities as at the date of this report.

AUDITOR

A copy of the Auditor’s Independence Declaration as required under LE0-15 of the Australian Charities and Not-for-profits Commission Act 2012 is included on page 9 of this financial report. PricewaterhouseCoopers continues in office in accordance with section 327 of the Corporations Act 2001. This report is made in accordance with a resolution of Directors.

Auditor’s Independence Declaration

As lead auditor for the audit of AARNet Pty Ltd for the year ended 31 December 2018, I declare that to the best of my knowledge and belief, there have been no contraventions of any applicable code of professional conduct in relation to the audit.

Scott Walsh
Partner
PricewaterhouseCoopers
Sydney
19 March 2019

PricewaterhouseCoopers, ABN 52 780 433 757
One International Towers Sydney, Watermans Quay, Barangaroo, GPO BOX 2650, SYDNEY NSW 2001
Level 11, 1PSQ, 169 Macquarie Street, Parramatta NSW 2150, PO Box 1155 Parramatta NSW 2124

Liability limited by a scheme approved under Professional Standards Legislation.
STATEMENT OF SURPLUS

<table>
<thead>
<tr>
<th>Notes</th>
<th>2018</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Services revenue</td>
<td>$8,164,091</td>
<td>7,418,740</td>
</tr>
<tr>
<td>Other revenue</td>
<td>$7,046,809</td>
<td>3,469,645</td>
</tr>
<tr>
<td>Grants and contributions received</td>
<td>$403,189</td>
<td>536,161</td>
</tr>
<tr>
<td><strong>Total revenue</strong></td>
<td><strong>$9,614,080</strong></td>
<td><strong>$7,410,456</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecommunications expenses</td>
<td>$(12,257,202)</td>
<td>$(13,846,895)</td>
</tr>
<tr>
<td>Depreciation and amortisation - Telecommunications</td>
<td>$(10,296,029)</td>
<td>$(10,319,043)</td>
</tr>
<tr>
<td>Employee benefits expense - Telecommunications</td>
<td>$(17,856,250)</td>
<td>$(15,489,888)</td>
</tr>
<tr>
<td>Administration - Telecommunications</td>
<td>$(10,000,233)</td>
<td>$(8,005,657)</td>
</tr>
<tr>
<td>Infrastructure project construction</td>
<td>$(2,837,920)</td>
<td>$(3,148,751)</td>
</tr>
<tr>
<td>Depreciation and amortisation - Infrastructure projects</td>
<td>$(7,203,185)</td>
<td>$(7,615,157)</td>
</tr>
<tr>
<td>Employee benefits expense - Infrastructure Development Group</td>
<td>$(5,228,181)</td>
<td>$(2,999,370)</td>
</tr>
<tr>
<td>Administration - Infrastructure Development Group</td>
<td>$(193,733)</td>
<td>$(187,143)</td>
</tr>
<tr>
<td>Other expenses (including finance costs)</td>
<td>$(10,240,132)</td>
<td>$(2,971,750)</td>
</tr>
<tr>
<td><strong>Total expenses</strong></td>
<td><strong>$(73,665,629)</strong></td>
<td><strong>$(70,920,414)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net surplus</strong></td>
<td><strong>$15,468,460</strong></td>
<td><strong>$7,520,730</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Movement in the fair value of available-for-sale financial assets</strong></td>
<td><strong>$(837,568)</strong></td>
<td><strong>$239,659</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total comprehensive surplus for the year</strong></td>
<td><strong>$14,631,092</strong></td>
<td><strong>$9,763,791</strong></td>
</tr>
</tbody>
</table>

The above Statement of Surplus should be read in conjunction with the accompanying notes:

BALANCE SHEET

<table>
<thead>
<tr>
<th>Notes</th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>ASSETS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash and cash equivalents</td>
<td>$23,702,332</td>
<td>23,566,326</td>
</tr>
<tr>
<td>Receivables</td>
<td>$5,937,549</td>
<td>36,747,108</td>
</tr>
<tr>
<td>Derivative financial instruments</td>
<td>24</td>
<td>834,915</td>
</tr>
<tr>
<td>Accrued income</td>
<td>14</td>
<td>797,885</td>
</tr>
<tr>
<td>Financial instruments at amortised cost</td>
<td>16</td>
<td>597,030</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>$109,889,804</strong></td>
<td><strong>$96,410,473</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-current assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receivables</td>
<td>19</td>
<td>214,195</td>
</tr>
<tr>
<td>Financial assets at fair value through statement of changes in equity</td>
<td>18</td>
<td>9,302,267</td>
</tr>
<tr>
<td>Derivative financial instruments</td>
<td>24</td>
<td>485,492</td>
</tr>
<tr>
<td>Other financial assets - Non-controlling investment in Smart Services CRC Pty Ltd</td>
<td>20</td>
<td>107,845,408</td>
</tr>
<tr>
<td>Property, plant and equipment</td>
<td>21</td>
<td>87,683,386</td>
</tr>
<tr>
<td>Defeasible Rights to Use traffic paths</td>
<td>20</td>
<td>75,746,689</td>
</tr>
<tr>
<td><strong>Total non-current assets</strong></td>
<td><strong>$223,258,074</strong></td>
<td><strong>$209,493,087</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>$334,147,878</strong></td>
<td><strong>$305,903,560</strong></td>
</tr>
</tbody>
</table>

The above Balance Sheet should be read in conjunction with the accompanying notes:

LIABILITIES

<table>
<thead>
<tr>
<th>Notes</th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Current liabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payables</td>
<td>3</td>
<td>11,929,419</td>
</tr>
<tr>
<td>Derivative financial instruments</td>
<td>24</td>
<td>702,888</td>
</tr>
<tr>
<td>Provisions</td>
<td>6</td>
<td>5,375,756</td>
</tr>
<tr>
<td>Other liabilities</td>
<td>6</td>
<td>336,746</td>
</tr>
<tr>
<td>Income in advance</td>
<td>4</td>
<td>36,311,337</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>$73,735,260</strong></td>
<td><strong>$94,415,752</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-current liabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income in advance</td>
<td>5</td>
<td>45,468,827</td>
</tr>
<tr>
<td>Derivative financial instruments</td>
<td>24</td>
<td>1,229,649</td>
</tr>
<tr>
<td>Provisions</td>
<td>7</td>
<td>462,886</td>
</tr>
<tr>
<td><strong>Total non-current liabilities</strong></td>
<td><strong>$46,209,651</strong></td>
<td><strong>$46,893,977</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td><strong>$119,948,911</strong></td>
<td><strong>$101,305,725</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net assets</strong></td>
<td><strong>$214,198,927</strong></td>
<td><strong>$194,597,835</strong></td>
</tr>
</tbody>
</table>

The above Balance Sheet should be read in conjunction with the accompanying notes:

EQUITY

<table>
<thead>
<tr>
<th>Notes</th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Contributed equity</td>
<td>22</td>
<td>39,039</td>
</tr>
<tr>
<td>Reserve (accumulated unrealised gain/loss on investments)</td>
<td>23</td>
<td>384,857</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>23</td>
<td>214,408,927</td>
</tr>
<tr>
<td><strong>Total equity</strong></td>
<td><strong>$214,198,927</strong></td>
<td><strong>$194,597,835</strong></td>
</tr>
</tbody>
</table>

The above Balance Sheet should be read in conjunction with the accompanying notes:
STATEMENT OF CHANGES IN EQUITY

2018 2017
Total equity at the beginning of the financial year $199,567,835 $189,804,044
Changes in financial assets at fair value, net of tax (837,368) 239,659
Net surplus for the year 15,468,460 9,524,132
Total recognised surplus and expense for the year 14,631,092 9,763,791
Total equity at the end of the financial year 214,198,927 199,567,835

The above statement of changes in equity should be read in conjunction with the accompanying notes.

STATEMENT OF CASH FLOWS

Notes 2018 2017
Cash flows from operating activities
Receipts from members and customers (inclusive of goods and services tax) 91,861,883 92,152,847
Payments to suppliers and employees (inclusive of goods and services tax) (63,609,595) (59,300,557)
Net cash inflow from operating activities 28,252,288 32,852,290
Cash flows from investing activities (30,894,755) (17,406,468)
Payments for property, plant and equipment (30,894,755) (17,406,468)
Payments for Indefeasible Rights to Use traffic paths (intangible assets) (89,569,935) (101,375,661)
Proceeds from sale of financial assets at fair value through statement of changes in equity 4,647,677 5,229,542
Proceeds from financial instruments at amortised cost 86,611,580 89,425,000
Dividends received 518,049 553,833
Interest received 2,460,594 2,201,293
Proceeds from sale of property, plant and equipment - 8,000
Net cash outflow from investing activities (28,116,282) (27,779,866)
Net increase/(decrease) in cash and cash equivalents 136,006 5,072,424
Cash and cash equivalents at the beginning of the financial year 23,566,326 18,493,902
Cash and cash equivalents at end of year 23,702,332 23,566,326

The above statement of cash flows should be ready in conjunction with the accompanying notes.

NOTES TO THE FINANCIAL STATEMENTS

1. BASIS OF PREPARATION
These general purpose financial statements have been prepared in accordance with Australian Accounting Standards and interpretations issued by the Australian Accounting Standards Board and the Australian Charities and Not-for-profits Commission Act 2012. AARNet Pty Ltd is domiciled in Australia and is a not-for-profit entity for the purpose of preparing the financial statements. The registered address of AARNet Pty Ltd is Tower A, Level 7 799 Pacific Highway, Chatswood, NSW, 2067.

Historical cost convention
The financial statements have been prepared on a historical cost basis, except for the following: financial assets at fair value through statement of changes in equity, financial assets and liabilities (including derivative instruments) and certain classes of property, plant and equipment.

Income tax
AARNet is exempt from income tax under Section 50-5 of the Income Tax Assessment Act 1997 and therefore, no provision for income tax is included in these financial statements.

2. COMMITMENTS AND CONTINGENCIES
(a) Expenditure and capital commitments

<table>
<thead>
<tr>
<th>Commitments</th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within one year</td>
<td>$20,154,945</td>
<td>$20,496,787</td>
</tr>
<tr>
<td>Later than one year but not later than five years</td>
<td>$8,746,604</td>
<td>$8,746,604</td>
</tr>
<tr>
<td>Later than five years</td>
<td>$102,600</td>
<td>$148,238</td>
</tr>
</tbody>
</table>

(b) Lease and capacity commitments: AARNet as lessee

<table>
<thead>
<tr>
<th>Commitments not recognised in the financial statements</th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>$121,648,225</td>
<td>$120,715,519</td>
<td></td>
</tr>
</tbody>
</table>

(c) Contingent Liabilities
AARNet’s bankers have issued bank guarantees in favour of the Company’s landlords and a third-party contractor with total face value of $906,363 (2017: $1,064,584).

NOTES TO THE FINANCIAL STATEMENTS
3. CURRENT LIABILITIES - PAYABLES

<table>
<thead>
<tr>
<th></th>
<th>31 December 2018</th>
<th>31 December 2017</th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current liabilities</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Trade payables</td>
<td>3,795,181</td>
<td>2,855,890</td>
<td>4,262,308</td>
<td>4,445,565</td>
</tr>
<tr>
<td>Other payables</td>
<td>8,134,238</td>
<td>7,292,521</td>
<td>1,759,755</td>
<td>1,715,016</td>
</tr>
<tr>
<td></td>
<td>11,929,419</td>
<td>10,148,411</td>
<td>45,468,827</td>
<td>45,207,438</td>
</tr>
</tbody>
</table>

Trade payables and accruals are expected to be paid within 30 days. These amounts represent liabilities for goods and services provided to AARNet prior to the end of the financial year which are unpaid. The amounts are unsecured and are usually paid within 30 days of recognition.

Accounting Policy

The fair value of financial liabilities for disclosure purposes is estimated by discounting the future contractual cash flows at the current market interest rate that is available to AARNet for similar financial instruments.

4. CURRENT LIABILITIES - INCOME IN ADVANCE

<table>
<thead>
<tr>
<th></th>
<th>31 December 2018</th>
<th>31 December 2017</th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>establishment fees</td>
<td>18,085,038</td>
<td>11,581,080</td>
<td>42,262,308</td>
<td>41,445,565</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>1,271,242</td>
<td>1,296,140</td>
<td>1,759,755</td>
<td>1,715,016</td>
</tr>
<tr>
<td>Other deferred income</td>
<td>-</td>
<td>-151,141</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>19,356,282</td>
<td>12,877,220</td>
<td>44,022,063</td>
<td>43,160,571</td>
</tr>
</tbody>
</table>

Accounting Policy

The Accounting Policy for Income in Advance is described in note B.

5. NON-CURRENT LIABILITIES - INCOME IN ADVANCE

<table>
<thead>
<tr>
<th></th>
<th>31 December 2018</th>
<th>31 December 2017</th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>establishment fees</td>
<td>18,085,038</td>
<td>11,581,080</td>
<td>42,262,308</td>
<td>41,445,565</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>1,271,242</td>
<td>1,296,140</td>
<td>1,759,755</td>
<td>1,715,016</td>
</tr>
<tr>
<td>Other deferred income</td>
<td>-</td>
<td>-151,141</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>19,356,282</td>
<td>12,877,220</td>
<td>44,022,063</td>
<td>43,160,571</td>
</tr>
</tbody>
</table>

Accounting Policy

The Accounting Policy for Income in Advance is described in note B.

6. CURRENT LIABILITIES - PROVISIONS

<table>
<thead>
<tr>
<th></th>
<th>31 December 2018</th>
<th>31 December 2017</th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>establishment fees</td>
<td>18,085,038</td>
<td>11,581,080</td>
<td>42,262,308</td>
<td>41,445,565</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>1,271,242</td>
<td>1,296,140</td>
<td>1,759,755</td>
<td>1,715,016</td>
</tr>
<tr>
<td>Other deferred income</td>
<td>-</td>
<td>-151,141</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>19,356,282</td>
<td>12,877,220</td>
<td>44,022,063</td>
<td>43,160,571</td>
</tr>
</tbody>
</table>

Accounting Policy

Wages and salaries and annual leave

Liabilities for wages and salaries, including non-monetary benefits and leave entitlements expected to be settled within 12 months of the reporting date, are recognised in respect of employees' services up to the reporting date and are measured at the amounts expected to be paid when the liabilities are settled.

7. NON-CURRENT LIABILITIES - PROVISIONS

<table>
<thead>
<tr>
<th></th>
<th>31 December 2018</th>
<th>31 December 2017</th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>establishment fees</td>
<td>18,085,038</td>
<td>11,581,080</td>
<td>42,262,308</td>
<td>41,445,565</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>1,271,242</td>
<td>1,296,140</td>
<td>1,759,755</td>
<td>1,715,016</td>
</tr>
<tr>
<td>Other deferred income</td>
<td>-</td>
<td>-151,141</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>19,356,282</td>
<td>12,877,220</td>
<td>44,022,063</td>
<td>43,160,571</td>
</tr>
</tbody>
</table>

Accounting Policy

Employee benefits

These are liabilities for long service leave and annual leave not expected to be settled wholly within 12 months after the end of the period in which the employees render the related service. They are therefore recognised in the provision for employee benefits and measured as the present value of expected future payments to be made in respect of services provided by employees up to the end of the reporting period using the projected unit credit method.

Consideration is given to expected future wage and salary levels, experience of employee departures and periods of service. Expected future payments are discounted using market yields at the end of the reporting period of corporate bonds with terms and currencies that match, as closely as possible, the estimated future cash outflows. Re-measurements as a result of experience adjustments are recognised in the Statement of Surplus.

Make good on leased premises

Provisions for make good costs on leased premises are recognised when AARNet has a present legal or constructive obligation as a result of past events; it is more likely than not that an outflow of resources will be required to settle the obligation; and the amount has been reliably estimated.
**8. SERVICE REVENUE**

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Telecommunications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Members: Subscription, Traffic and Access</td>
<td>40,593,177</td>
<td>40,399,463</td>
</tr>
<tr>
<td>Non-Member: Subscription, Traffic and Access</td>
<td>18,153,707</td>
<td>16,097,666</td>
</tr>
<tr>
<td>Other Services</td>
<td>16,915,079</td>
<td>13,901,773</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>75,661,973</td>
<td>70,398,902</td>
</tr>
<tr>
<td><strong>Infrastructure &amp; service agreements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure Establishment Fees</td>
<td>4,742,009</td>
<td>4,210,075</td>
</tr>
<tr>
<td>Infrastructure Project Construction</td>
<td>1,280,109</td>
<td>1,280,109</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>81,684,091</td>
<td>80,403,982</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Telecommunications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Members: Subscription, Traffic and Access</td>
<td>40,399,463</td>
<td>40,593,177</td>
</tr>
<tr>
<td>Non-Member: Subscription, Traffic and Access</td>
<td>16,097,666</td>
<td>18,153,707</td>
</tr>
<tr>
<td>Other Services</td>
<td>13,901,773</td>
<td>16,915,079</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>76,438,740</td>
<td>80,403,982</td>
</tr>
</tbody>
</table>

**a) Disaggregation of revenue from contracts with customers**

AARNet derives revenue from the transfer of goods and services over time and at a point in time in the following major product lines:

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Telecommunications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At a point in time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over time</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Infrastructure &amp; service agreements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At a point in time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over time</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**b) Assets and liabilities related to contracts with customers**

AARNet has recognised the following assets and liabilities related to contracts with customers:

<table>
<thead>
<tr>
<th></th>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure Establishment Fees</td>
<td>18,095,038</td>
<td>11,581,080</td>
</tr>
<tr>
<td>Other Deferred Income</td>
<td>1,272,242</td>
<td>1,296,242</td>
</tr>
<tr>
<td>Infrastructure Service Fees</td>
<td>7,359,282</td>
<td>1,986,275</td>
</tr>
<tr>
<td>Subscriptions</td>
<td>20,585,775</td>
<td>24,790,632</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Revenue recognized in relation to contract liabilities**

The table shows how much of the revenue recognised in the current reporting period relates to carried forward contract liabilities.
9. OTHER REVENUE, GRANTS AND CONTRIBUTIONS RECEIVED

In 2018 and 2017 AARNet recorded significant amounts of Other Revenue, Grants Received and Other Contributions. These amounts are a material component of the surplus recorded by AARNet.

<table>
<thead>
<tr>
<th>Year</th>
<th>2018</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>$2,570,380</td>
<td>$2,126,636</td>
</tr>
<tr>
<td>Dividends</td>
<td>$616,516</td>
<td>$528,390</td>
</tr>
<tr>
<td>Gain on foreign currency contracts</td>
<td>$3,050,943</td>
<td></td>
</tr>
<tr>
<td>Gain on financials at fair value through statement of changes in equity</td>
<td>$84,177</td>
<td>$225,594</td>
</tr>
<tr>
<td>Other income</td>
<td>$565,793</td>
<td>$589,025</td>
</tr>
<tr>
<td>Other Revenue</td>
<td>$7,046,009</td>
<td>$3,469,649</td>
</tr>
<tr>
<td>Grants and Contributions received</td>
<td>$409,189</td>
<td>$536,161</td>
</tr>
</tbody>
</table>

Gain on Foreign Currency Contracts

AARNet hedges a significant proportion of its exposure to foreign currency movements (refer note 24) and does not apply hedge accounting. The accounting policy adopted with respect to derivatives and hedging activities is described below. During 2018 movements in the Australian dollar produced a gain (including realised and unrealised gain) on the hedging instruments held during and as at the end of the year of $3,250,943 (2017: loss of $2,336,325) (refer note 10). Grants and Contributions Received

This item includes amounts received by AARNet by way of grants and contributions where AARNet does not supply a service to the organisations providing the funding.

Accounting Policy

Interest and Dividend Income

Interest and dividend income is recognised as a revenue item when the right to receive payment is established.

Foreign Currency Contracts

At year end, Foreign Currency Contracts are recognised at fair value as described in note 24 (see Derivative Financial Instruments). Realised and unrealised gain or losses on such contracts are taken into account each year in the Statement of Surplus. AARNet does not apply hedge accounting.

Contributed Assets

Contributed assets (including the contribution of funds by government agencies or other persons to facilitate the construction of infrastructure for the AARNet network) are recognised at fair value when title and control of the asset passes or when the conditions to receive or retain funding are met.

10. EXPENSES

<table>
<thead>
<tr>
<th>Item</th>
<th>2018</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depreciation</td>
<td>$1,203,732</td>
<td>$817,034</td>
</tr>
<tr>
<td>Leasehold improvements</td>
<td>$627,276</td>
<td>$144,564</td>
</tr>
<tr>
<td>Communication assets</td>
<td>$3,266,292</td>
<td>$9,555,856</td>
</tr>
<tr>
<td>Software</td>
<td>51,466</td>
<td>66,391</td>
</tr>
<tr>
<td>Buildings</td>
<td>1,071</td>
<td></td>
</tr>
<tr>
<td>Total depreciation</td>
<td>20,111,857</td>
<td>10,987,593</td>
</tr>
<tr>
<td>Amortisation</td>
<td>8,298,175</td>
<td>6,921,805</td>
</tr>
<tr>
<td>Intangibles - Indefinite life rights to use traffic paths</td>
<td>8,298,175</td>
<td>6,921,805</td>
</tr>
<tr>
<td>Total depreciation and amortisation</td>
<td>19,510,012</td>
<td>17,909,398</td>
</tr>
<tr>
<td>Other expenses (including finance costs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss on foreign currency contracts</td>
<td>- 2,336,325</td>
<td></td>
</tr>
<tr>
<td>Loss on foreign currency transactions</td>
<td>- 102,589</td>
<td></td>
</tr>
<tr>
<td>Loss on disposal of assets</td>
<td>1,531</td>
<td></td>
</tr>
<tr>
<td>Total other expenses</td>
<td>104,120</td>
<td>2,971,710</td>
</tr>
<tr>
<td>Rental expense relating to operating leases</td>
<td>1,615,850</td>
<td>1,148,152</td>
</tr>
<tr>
<td>Superannuation expense</td>
<td>2,533,695</td>
<td>2,524,579</td>
</tr>
</tbody>
</table>

Accounting Policy

Depreciation and Amortisation

The accounting policy for depreciation and amortisation is described in notes 20 and 21 respectively.

11. CURRENT ASSETS - CASH AND CASH EQUIVALENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>2018</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash at bank and on hand (AUD)</td>
<td>$12,955,159</td>
<td>9,685,550</td>
</tr>
<tr>
<td>Cash at bank (USD and EUR)</td>
<td>$2,265,561</td>
<td>7,578,080</td>
</tr>
<tr>
<td>Deposits at call - all denominated in AUD</td>
<td>8,571,812</td>
<td>6,302,696</td>
</tr>
<tr>
<td>Total</td>
<td>23,702,332</td>
<td>23,566,326</td>
</tr>
</tbody>
</table>

Accounting Policy

For the purpose of presentation in the statement of cash flows, cash and cash equivalents includes cash on hand, deposits held at call with financial institutions, bank overdrafts and other short-term, highly liquid investments with original maturities of three months or less that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value.
12. RECONCILIATION OF NET SURPLUS TO NET CASH INFLOW FROM OPERATING ACTIVITIES

<table>
<thead>
<tr>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepayments and Other Debtors</td>
<td>$4,040,342</td>
</tr>
<tr>
<td>Depreciation and amortisation</td>
<td>$3,510,012</td>
</tr>
<tr>
<td>Dividend income</td>
<td>$1,516,518</td>
</tr>
<tr>
<td>Interest received</td>
<td>$(2,460,594)</td>
</tr>
<tr>
<td>Net gain on sale of investments</td>
<td>$(41,177)</td>
</tr>
<tr>
<td>Net amortised interest income</td>
<td>$(41,798)</td>
</tr>
<tr>
<td>Net loss/(gain) on sale of assets</td>
<td>$1,531</td>
</tr>
<tr>
<td>Write off of CCRW</td>
<td>$(8,000)</td>
</tr>
<tr>
<td>Decrease/(increase) in accruals</td>
<td>$(156,690)</td>
</tr>
<tr>
<td>Increase in other operating liabilities</td>
<td>$32,852,290</td>
</tr>
<tr>
<td>Increase/(decrease) in trade receivables</td>
<td>$367,565</td>
</tr>
<tr>
<td>Increase/(decrease) in accrued income</td>
<td>$(873,864)</td>
</tr>
<tr>
<td>Decrease/(increase) in prepayments and other debtors</td>
<td>$390,606</td>
</tr>
<tr>
<td>Decrease/(increase) in accrued income</td>
<td>$(157,391)</td>
</tr>
<tr>
<td>Decrease/(increase) in inventory and other debtors</td>
<td>$(255,000)</td>
</tr>
<tr>
<td>Decrease/(increase) in derivative financial instruments</td>
<td>$797,885</td>
</tr>
<tr>
<td>Increase/(decrease) in trade receivables</td>
<td>$49,042</td>
</tr>
<tr>
<td>Increase in other operating liabilities</td>
<td>$2,467,467</td>
</tr>
<tr>
<td>Increase in provisions</td>
<td>$1,086,022</td>
</tr>
<tr>
<td>Increase/(decrease) in income received in advance</td>
<td>$3,918,501</td>
</tr>
<tr>
<td>Net cash inflow from operating activities</td>
<td>$32,852,290</td>
</tr>
</tbody>
</table>

13. CURRENT ASSETS - RECEIVABLES

<table>
<thead>
<tr>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade receivables</td>
<td>$48,222,007</td>
</tr>
<tr>
<td>Provision for impairment of receivables</td>
<td>$25,000</td>
</tr>
<tr>
<td>Prepayments and Other Debtors</td>
<td>$4,090,342</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$51,997,349</td>
</tr>
</tbody>
</table>

Trade Receivables
Trade receivables are due for settlement no more than 30 days from the date of recognition. At 31 December 2018, trade receivables included balances of $31,053,845 (2017: $35,598) which are past due but not impaired or considered uncollectable. These amounts have been outstanding for more than 90 days. These relate to a number of customers for whom there is no history of default.

Prepayments and Other Debtors
Payments for goods and services which are to be provided in future years are recognised as prepayments. Other debtors generally arise from transactions outside the usual operating activities of AARNet. Interest is not normally charged.

Trade receivables are due for settlement no more than 30 days from the date of recognition. They are unsecured and non-interest bearing.

14. CURRENT ASSETS - ACCRUED INCOME

<table>
<thead>
<tr>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$25,000</td>
</tr>
<tr>
<td>Infrastructure projects</td>
<td>$25,000</td>
</tr>
<tr>
<td>Telecommunications expenses</td>
<td>$25,000</td>
</tr>
<tr>
<td>Other accrued interest receivable</td>
<td>$25,000</td>
</tr>
</tbody>
</table>

Trade Receivables
Trade receivables are due for settlement no more than 30 days from the date of recognition. They are unsecured and non-interest bearing.

15. FINANCIAL ASSETS AND INVESTMENTS

AARNet holds financial assets and investments (other than prepayments or trade receivables) including:

- Financial instruments at amortised cost (notes 16 and 17)
- Derivative financial instruments (as shown on the Balance Sheet)

Accounting Policy
Trade receivables are recorded at fair value, less provision for impairment. Collectability of trade receivables is reviewed on an ongoing basis. Any impairments are recognised in the Statement of Surplus in Administration-Telecommunications expenses.

The carrying value less impairment provision of trade receivables is assumed to approximate fair value due to the short-term nature of the receivables.

Financial instruments at amortised cost are non-derivative financial instruments with fixed or determinable payments and fixed maturities that are not readily convertible into another instrument that matures within 3 years of the purchase date or an instrument that is not readily convertible into another instrument that is due at the earlier of a debt security which has been impaired increases, due to an event which has occurred after the impairment was recognised, the impairment provision is reversed through the Statement of Surplus.

Impairment losses on equity financial assets at fair value through statement of changes in equity previously recognised in the Statement of Surplus are not reversed subsequently if the fair value of a debt security which has been impaired increases, due to an event which has occurred after the impairment was recognised, the impairment provision is reversed through the Statement of Surplus.

When securities classified as financial assets at fair value through statement of changes in equity are sold, the accumulated fair value adjustments recognised in Statement of changes in equity are reclassified to the Statement of Surplus.

18 NOTES TO THE FINANCIAL STATEMENTS
19 NOTES TO THE FINANCIAL STATEMENTS
The following table presents the company’s assets and liabilities measured and recognised at fair value at 31 December 2018 and 31 December 2017.

<table>
<thead>
<tr>
<th>31 December 2018</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Derivative financial instruments</td>
<td>- 1,320,407</td>
<td>- 1,320,407</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial assets at fair value through statement of changes in equity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity securities</td>
<td>5,200,622</td>
<td>-</td>
<td>- 5,200,622</td>
<td></td>
</tr>
<tr>
<td>Bonds</td>
<td>4,012,645</td>
<td>-</td>
<td>- 4,012,645</td>
<td></td>
</tr>
<tr>
<td>Total assets</td>
<td>9,302,267</td>
<td>1,320,407</td>
<td>- 10,622,674</td>
<td></td>
</tr>
<tr>
<td><strong>Liabilities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Derivative financial instruments</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total liabilities</td>
<td>- 1,930,536</td>
<td>- 1,930,536</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bank guarantee and credit facilities
AARNet has a $1,500,000 Bank Guarantee Facility provided by the National Australia Bank. AARNet has drawn on this facility to provide bank guarantees in favour of the landlords for leased premises and a third party contractor. AARNet has an unsecured credit card facility of $300,000.

<table>
<thead>
<tr>
<th>31 December 2017</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial assets at fair value through statement of changes in equity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity securities</td>
<td>5,901,795</td>
<td>-</td>
<td>- 5,901,795</td>
<td></td>
</tr>
<tr>
<td>Bonds</td>
<td>6,923,428</td>
<td>-</td>
<td>- 6,923,428</td>
<td></td>
</tr>
<tr>
<td>Total assets</td>
<td>12,825,223</td>
<td>- 12,825,223</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Liabilities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Derivative financial instruments</td>
<td>- 1,950,536</td>
<td>- 1,950,536</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total liabilities</td>
<td>- 1,950,536</td>
<td>- 1,950,536</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The fair value of financial instruments traded in active markets (such as financial assets at fair value through statement of changes in equity) are based on quoted market prices at the end of the reporting period. These instruments are included in level 1.

The fair value of financial instruments that are not traded in an active market (such as derivative financial instruments) are determined using valuation techniques. These valuation techniques maximise the use of observable market data where it is available and rely as little as possible on entity specific estimates. If all significant inputs required to fair value an instrument are observable, the instrument is included in level 2.

16. CURRENT ASSETS - FINANCIAL INSTRUMENTS AT AMORTISED COST

<table>
<thead>
<tr>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Debt securities (fixed and floating rates)</strong></td>
<td>$</td>
</tr>
<tr>
<td>Term deposits</td>
<td>3,757,323</td>
</tr>
<tr>
<td>Financial assets at fair value through statement of changes in equity</td>
<td></td>
</tr>
<tr>
<td>Equity securities</td>
<td>5,200,622</td>
</tr>
<tr>
<td>Bonds</td>
<td>4,012,645</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bank guarantee and credit facilities</strong></td>
<td>$</td>
</tr>
</tbody>
</table>
| AARNet has a $1,500,000 Bank Guarantee Facility provided by the National Australia Bank. AARNet has drawn on this facility to provide bank guarantees in favour of the landlords for leased premises and a third party contractor. AARNet has an unsecured credit card facility of $300,000.

17. NON-CURRENT ASSETS - FINANCIAL INSTRUMENTS AT AMORTISED COST

<table>
<thead>
<tr>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Debt securities (fixed and floating rates)</strong></td>
<td>$</td>
</tr>
<tr>
<td>Non-current assets</td>
<td>4,101,645</td>
</tr>
<tr>
<td>Equity securities</td>
<td>5,200,622</td>
</tr>
</tbody>
</table>

18. NON-CURRENT ASSETS - FINANCIAL ASSETS AT FAIR VALUE THROUGH STATEMENT OF CHANGES IN EQUITY

<table>
<thead>
<tr>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Debt securities (fixed and floating rates)</strong></td>
<td>$</td>
</tr>
<tr>
<td>Non-current assets</td>
<td>100,431</td>
</tr>
<tr>
<td>Equity securities</td>
<td>5,200,622</td>
</tr>
</tbody>
</table>

19. NON-CURRENT ASSETS - RECEIVABLES

<table>
<thead>
<tr>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prepayments</strong></td>
<td>$</td>
</tr>
</tbody>
</table>
| AARNet has a $1,500,000 Bank Guarantee Facility provided by the National Australia Bank. AARNet has drawn on this facility to provide bank guarantees in favour of the landlords for leased premises and a third party contractor. AARNet has an unsecured credit card facility of $300,000.

20. NON-CURRENT ASSETS - PROPERTY, PLANT AND EQUIPMENT

<table>
<thead>
<tr>
<th>Buildings</th>
<th>Leasehold improvements</th>
<th>Office equipment</th>
<th>Communication assets</th>
<th>Software</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 December 2018</td>
<td>$</td>
<td></td>
<td>$</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>Opening net book amount</td>
<td>- 693,024</td>
<td>2,090,645</td>
<td>84,811,465</td>
<td>88,252</td>
<td>87,683,386</td>
</tr>
<tr>
<td>Additions</td>
<td>81,007</td>
<td>2,121,196</td>
<td>2,589,341</td>
<td>27,543,926</td>
<td>9,000</td>
</tr>
<tr>
<td>Disposals</td>
<td>-</td>
<td>-</td>
<td>(515,513)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Additions (finance leases)</td>
<td>-</td>
<td>-</td>
<td>260,796</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Disposal (finance leases)</td>
<td>-</td>
<td>-</td>
<td>(1,260,796)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Depreciation charge</td>
<td>(3,071)</td>
<td>(627,276)</td>
<td>(1,203,732)</td>
<td>(9,326,292)</td>
<td>(51,466)</td>
</tr>
<tr>
<td>Closing net book amount</td>
<td>78,856</td>
<td>2,186,944</td>
<td>3,474,723</td>
<td>101,829,099</td>
<td>45,786</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>31 December 2018</th>
<th>31 December 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buildings</strong></td>
<td>$</td>
</tr>
<tr>
<td>Office equipment</td>
<td>4,521,238</td>
</tr>
<tr>
<td>Communication assets</td>
<td>(1,371)</td>
</tr>
<tr>
<td>Software</td>
<td>76,856</td>
</tr>
</tbody>
</table>
Unincorporated Joint Operations
AARNet accounts for interests in unincorporated joint operations by recognising its share of the assets and liabilities held or owed by the joint operation along with its share of the expenses incurred by the joint operation.

Where the assets held within the joint operation include assets in the course of construction, AARNet’s share of those assets is included in the results for assets in the course of construction shown in this note.

Depreciation
Property, plant and equipment is depreciated using the straight-line method to allocate net, cost of residual value, over each item’s estimated useful life, as follows:

- Leasehold improvements 10 years
- Office equipment 5 - 6 years
- Leased communication assets 5 - 6 years
- Leased office equipment 3 years
- Office equipment 3 years
- Software 2 - 3 years

The assets’ residual values and useful lives are reviewed, and adjusted if appropriate, at the end of each reporting period. Such adjustments may result in a revised useful life shorter than that shown above.

Impairment of Assets
Assets that are subject to depreciation or amortisation are reviewed for indicators of impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset’s carrying amount exceeds its recoverable amount.

The recoverable amount is the higher of the asset’s fair value less costs to sell and value in use. As a not-for-profit entity, value in use is calculated on the basis of the depreciated replacement cost, which represents the current replacement cost of an asset less, where applicable, accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired future economic benefits of the asset.

For the purposes of assessing impairment, assets are grouped at the lowest level for which there are separately identifiable cash flows (cash generating units). The company has only one cash generating unit.

Gains and Losses
Gains and losses on disposals are determined by comparing proceeds with carrying amount. These are included in the Statement of Surplus.

AARNet’s intangible assets are indefeasible rights to use (IRU) capacity on traffic paths across communication infrastructure owned by other parties.

Accounting Policy
AARNet provides other parties with rights to use components of AARNet’s fibre and infrastructure in return for that party providing AARNet with similar rights to use components of its fibre and infrastructure.

These arrangements are in the nature of two separate finance leases with each party acting as lessor and lessee. Each lease is treated as settled when both sides of the swap agreement come into force. Consequently, there is no lease finance cost or outstanding lease liability arising in respect of such transactions.

Assets in the course of construction
Included in the carrying amounts of the assets shown above are assets that were in the course of construction at the end of the reporting period. The relevant amounts are as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets in the course of construction</td>
<td>$36,996,317</td>
</tr>
<tr>
<td>Leasehold improvements</td>
<td>$1,601,048</td>
</tr>
<tr>
<td>Communication assets</td>
<td>$34,931,114</td>
</tr>
</tbody>
</table>

Movements in ordinary share capital

<table>
<thead>
<tr>
<th>Date</th>
<th>Details</th>
<th>Number of shares</th>
<th>Ordinary shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 January 2017</td>
<td>Opening balance</td>
<td>$78</td>
<td>39,039</td>
</tr>
<tr>
<td>31 December 2017</td>
<td>Balance</td>
<td>$78</td>
<td>39,039</td>
</tr>
<tr>
<td>31 December 2018</td>
<td>Balance</td>
<td>$78</td>
<td>39,039</td>
</tr>
</tbody>
</table>

AARNet’s shareholders are SR Australian Universities and the Commonwealth Scientific and Industrial Research Organisation (CSIRO). Each shareholder holds two ordinary shares. Holders of ordinary shares are entitled to one vote per share on resolutions put before the members. Holders of ordinary shares are not entitled to dividends and have no right to receive any distribution during a winding up.

23. RETAINED EARNINGS AND RESERVE

Retained earnings
Movements in retained earnings were as follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>Details</th>
<th>Number of shares</th>
<th>Ordinary shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 December 2018</td>
<td>Balance</td>
<td>$78</td>
<td>39,039</td>
</tr>
<tr>
<td>Balance 1 January</td>
<td>Opening balance</td>
<td>$78</td>
<td>39,039</td>
</tr>
<tr>
<td>Surplus for the year</td>
<td>$15,466</td>
<td>$8,545</td>
<td></td>
</tr>
<tr>
<td>Balance 31 December</td>
<td>$248,408</td>
<td>$198,939</td>
<td></td>
</tr>
</tbody>
</table>
24. FINANCIAL RISK MANAGEMENT

AARNet’s activities are exposed to a variety of financial risks including:

a) Market risk (including currency risk, interest rate risk and equity price risk)

b) Credit risk

c) Liquidity risk

This note explains the Company’s level of exposure to these risks, how these risks could affect the Company’s future financial performance and how AARNet manages the impact of these risks.

AARNet’s overall risk management program focuses on managing its liquidity and seeking to minimise potential adverse effects on financial performance. The Board, through the Audit, Finance & Risk Committee, is responsible for setting the overall objectives for risk management and provides specific policies where necessary.

The day to day risk management is carried out by identifying, evaluating and hedging financial risks. This is the responsibility of the Chief Executive Officer (CEO) and the Chief Financial Officer (CFO) and they are supported by operating management.

a) Market risk

i) Currency risk

AARNet operates equipment at international locations and deals with certain suppliers in foreign currencies and is impacted by changes in foreign exchange rates. The Company is primarily exposed to changes in the fair value of available-for-sale financial assets. At year end, AARNet held USD1,479,782 in USD denominated bank account.

AARNet’s risk management policy is to hedge at least 60% of anticipated short-term cash flows (mainly for the purchase of capacity to the USA) in USD.

The following table summarises the sensitivity of the Company’s financial assets and financial liabilities to foreign exchange risk for the year:

<table>
<thead>
<tr>
<th>Date</th>
<th>Carrying amount $</th>
<th>Surplus $</th>
<th>Equity $</th>
<th>Surplus $</th>
<th>Equity $</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 31 December 2018</td>
<td>23,702,332</td>
<td>(126,721)</td>
<td>214,370</td>
<td>214,370</td>
<td></td>
</tr>
<tr>
<td>At 31 December 2017</td>
<td>23,566,326</td>
<td>(90,674)</td>
<td>159,882</td>
<td>159,882</td>
<td></td>
</tr>
<tr>
<td>At 31 December 2016</td>
<td>23,419,512</td>
<td>(55,000)</td>
<td>205,942</td>
<td>205,942</td>
<td></td>
</tr>
</tbody>
</table>

(ii) Interest rate risk

AARNet’s main interest rate risk arises from its cash at bank, cash in deposits and financial instruments at amortised cost.

The Company’s interest rate risk is monitored using sensitivity analysis and is reviewed by management and the company’s external investment consultant.

The following table summarises the sensitivity of the Company’s financial assets and financial liabilities to interest rate risk for the year:

<table>
<thead>
<tr>
<th>Date</th>
<th>Carrying amount $</th>
<th>Surplus $</th>
<th>Equity $</th>
<th>Surplus $</th>
<th>Equity $</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 31 December 2018</td>
<td>23,702,332</td>
<td>(126,721)</td>
<td>214,370</td>
<td>214,370</td>
<td></td>
</tr>
<tr>
<td>At 31 December 2017</td>
<td>23,566,326</td>
<td>(90,674)</td>
<td>159,882</td>
<td>159,882</td>
<td></td>
</tr>
<tr>
<td>At 31 December 2016</td>
<td>23,419,512</td>
<td>(55,000)</td>
<td>205,942</td>
<td>205,942</td>
<td></td>
</tr>
</tbody>
</table>

(iv) Equity price risk

AARNet’s equity price risk arises from holding financial assets at fair value through statement of changes in equity such as equity instruments, listed bonds and hybrid investments.

Price risk is measured using sensitivity analysis and is monitored by management and the company’s external investment consultant.

The following table summarises the sensitivity of the Company’s financial assets and financial liabilities to price risk for the year:

<table>
<thead>
<tr>
<th>Date</th>
<th>Carrying amount $</th>
<th>Surplus $</th>
<th>Equity $</th>
<th>Surplus $</th>
<th>Equity $</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 31 December 2018</td>
<td>23,702,332</td>
<td>(126,721)</td>
<td>214,370</td>
<td>214,370</td>
<td></td>
</tr>
<tr>
<td>At 31 December 2017</td>
<td>23,566,326</td>
<td>(90,674)</td>
<td>159,882</td>
<td>159,882</td>
<td></td>
</tr>
<tr>
<td>At 31 December 2016</td>
<td>23,419,512</td>
<td>(55,000)</td>
<td>205,942</td>
<td>205,942</td>
<td></td>
</tr>
</tbody>
</table>

(b) Credit risk

Credit risk arises where a debtor fails to make contractual payments to AARNet as and when they fall due. AARNet is exposed to credit risk on its holdings of cash and cash equivalents, term deposits, corporate bonds and loan notes, hybrid securities and derivative financial instruments. Further credit risk arises from credit exposures to customers in the form of outstanding receivables and committed transactions.

<table>
<thead>
<tr>
<th>Date</th>
<th>Carrying amount $</th>
<th>Surplus $</th>
<th>Equity $</th>
<th>Surplus $</th>
<th>Equity $</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 31 December 2018</td>
<td>23,702,332</td>
<td>(126,721)</td>
<td>214,370</td>
<td>214,370</td>
<td></td>
</tr>
<tr>
<td>At 31 December 2017</td>
<td>23,566,326</td>
<td>(90,674)</td>
<td>159,882</td>
<td>159,882</td>
<td></td>
</tr>
<tr>
<td>At 31 December 2016</td>
<td>23,419,512</td>
<td>(55,000)</td>
<td>205,942</td>
<td>205,942</td>
<td></td>
</tr>
</tbody>
</table>

(iii) Assets at fair value through statement of changes in equity (price risk)

AARNet’s equity price risk arises from holding financial assets at fair value through statement of changes in equity such as equity instruments, listed bonds and hybrid investments.

Price risk is measured and using sensitivity analysis and is monitored by management and the company’s external investment consultant.

The following table summarises the sensitivity of the Company’s financial assets and financial liabilities to price risk for the year:

<table>
<thead>
<tr>
<th>Date</th>
<th>Carrying amount $</th>
<th>Surplus $</th>
<th>Equity $</th>
<th>Surplus $</th>
<th>Equity $</th>
</tr>
</thead>
<tbody>
<tr>
<td>At 31 December 2018</td>
<td>23,702,332</td>
<td>(126,721)</td>
<td>214,370</td>
<td>214,370</td>
<td></td>
</tr>
<tr>
<td>At 31 December 2017</td>
<td>23,566,326</td>
<td>(90,674)</td>
<td>159,882</td>
<td>159,882</td>
<td></td>
</tr>
<tr>
<td>At 31 December 2016</td>
<td>23,419,512</td>
<td>(55,000)</td>
<td>205,942</td>
<td>205,942</td>
<td></td>
</tr>
</tbody>
</table>
26. DIRECTORS

The Directors of AARNet Pty Ltd during the financial year were:

Chairman - non-executive
Emeritus Professor Gerard Sutton AO*

Executive Directors
Mr Chris Hancock, CEO

Directors
Mr Chris Bridge
Dr Christine Burn
Professor John Dewar
Professor Annabelle Duncan
Mr Robert Fitzpatrick*
Mr Jeff Murray
Mr John Nolan
Professor Deborah Terry
Emeritus Professor Mark Warwick AM*
Dr David Williams

*Denotes independent director

27. KEY MANAGEMENT PERSONNEL DISCLOSURES

Key management personnel compensation
The key management personnel are those who have authority and responsibility for planning, directing and controlling the activities of AARNet, directly or indirectly, during the year. The remuneration for key management personnel including directors is as follows:

31 December 2018 31 December 2017

Executive Directors $217,500 $210,000
Other key personnel $54,208 $54,208
Total $271,708 $264,208

Key management personnel include:
- Directors
- Executive Directors
- Other key personnel

28. REMUNERATION OF AUDITORS

PricewaterhouseCoopers
Audit and other assurance services
2018 2017
Audit $335,417 $335,417
Other $2,722,364 $2,722,364
Total $3,057,781 $3,057,781

29. OTHER SIGNIFICANT ACCOUNTING POLICIES

AARNet has applied the following standards and amendments for the first time for their annual reporting period commencing 1 January 2018:

- AASB 9 Financial Instruments (AASB 9)
- AASB 15 Revenue from Contracts with Customers (AASB 15)
- AASB 16 Leases

AARNet has applied the following standards and amendments for the first time during the year:

- AASB 1011 Consolidated Financial Reporting

AARNet has applied the following standards and amendments for the first time during the year:

- AASB 1018 Financial Instruments
- AASB 1019 Financial Instruments

29 (b) below, AASB 9 was generally adopted without restating comparative information.

Disclosure of the impact of the changes in the entity’s accounting policies, prior year financial statements had to be restated. As explained in note 29 (b) above, AASB 9 was generally adopted without restating comparative information.

The following tables show the adjustments recognised for each individual line item. Note that the totals have not been included. As a result, the sub-totals and total disclosed cannot be recalculated from the numbers provided. The adjustments are explained in more detail by standard below.
### Balance sheet (extract) 31 December 2017 as originally presented | AASB 15 | AASB 9 1 January 2018 Restated
---|---|---
**Current Assets**
Held to Maturity Investments | 35,500,000 | - | 35,500,000 | (35,500,000) | -
Financial Assets at Amortised Cost | - | - | - | 35,500,000 | 35,500,000
**Non-Current Assets**
Available for sale Financial Assets | 12,825,223 | - | 12,825,223 | (12,825,223) | -
Fair Value Through Statement of Changes in Equity
Held to Maturity Investments | - | - | - | 12,825,223 | 12,825,223
Financial Assets at Amortised Cost | 33,237,788 | - | 33,237,788 | (33,237,788) | -
**Current Liabilities**
Establishment Fees | 1,369,742 | (73,500) | - | 1,296,242 | -
Income in advance - Infrastructure | - | - | - | - | -
**Non-Current Liabilities**
Establishment Fees | 16,784,255 | (5,203,175) | - | 11,581,080 | -
Income in advance - Infrastructure | - | - | - | - | -
**Equity**
Income in advance - Infrastructure | 16,784,255 | (5,203,175) | - | 11,581,080 | -
Establishment Fees | 1,369,742 | (73,500) | - | 1,296,242 | -
Income in advance - Infrastructure | - | - | - | - | -
**Non-Current Liabilities**
Establishment Fees | 19,243,926 | 22,201,639 | 41,445,565 | - | 41,445,565
Income in advance - Infrastructure | - | - | - | - | -
**Equity**
Retained Earnings | 255,854,903 | (16,924,954) | 198,939,939 | - | 198,939,939

### Statement of Surplus 1 January 2018

<table>
<thead>
<tr>
<th>Fair Value Profit or Loss</th>
<th>Available for Sale 2017</th>
<th>Held to Maturity Amortised Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reclassify Current Assets 1 January 2018 as Held to Maturity Investments in Financial Assets at Amortised Cost</td>
<td>-</td>
<td>(35,500,000)</td>
</tr>
<tr>
<td>Reclassify Non-Current Assets Available for Sale Financial Assets to Financial Assets at Fair Value Through Profit or Loss</td>
<td>-</td>
<td>(35,500,000)</td>
</tr>
<tr>
<td>Reclassify Non-Current Assets Held to Maturity Income in advance Financial Assets</td>
<td>12,825,223</td>
<td>(12,825,223)</td>
</tr>
<tr>
<td>Investments in Financial Assets at Amortised Cost</td>
<td>-</td>
<td>(33,237,788)</td>
</tr>
</tbody>
</table>

### Statement of Profit or Loss

<table>
<thead>
<tr>
<th>Financial assets 1 January 2017</th>
<th>Fair Value Profit or Loss</th>
<th>Available for Sale 2017</th>
<th>Held to Maturity Amortised Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reclassify Current Assets 1 January 2018 as Held to Maturity Investments in Financial Assets at Amortised Cost</td>
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</tr>
</tbody>
</table>

### AASB 9 Revenue from Contracts with Customers

AARNet has adopted AASB 15 Revenue from Contracts with Customers from 1 January 2018 which resulted in changes in accounting policies and adjustments to the amounts recognised in the financial statements. In accordance with the retrospective application of AASB 15, AARNet has adopted the new rules retrospectively and has restated comparatives for the 2017 financial year. The following adjustments were made to the amounts recognised in the balance sheet at the date of initial application (1 January 2018) and the beginning of the earliest comparative year (2017).
There has been a significant change with the accounting for investments and other financial assets. Revenues, expenses and assets are recognised net of the amount of associated GST, unless the GST incurred is not recoverable from the customer exercise the right to extend the contract.

(i) Accounting for Establishment Fees under AASB15

Establishment fees were recognised over the initial term of the contract. AASB 15 requires the consideration of the period of any options to extend the contract providing that a material right exists that makes it probable that the customer will exercise the right for renewal. A material right will exist where there is a contractual right to extend the contract; and an establishment fee that was paid within the useful period of the contract will not be payable again should the customer exercise the right to extend the contract.

(ii) Presentation of assets and liabilities related to contracts with customers

Leases

Leases of property, plant and equipment where AARNet, as lessee, has substantially all the risks and rewards of ownership are classified as finance leases. Finance leases are capitalised at the lease's inception at the fair value of the underlying property, plant and equipment, or, if lower, the present value of the minimum lease payments. Corresponding rental obligations, net of finance charges, are included in either short-term and long-term payables. Each lease payment is allocated between the liability and finance cost. The finance cost is charged to the Statement of Surplus over the lease term as to produce a constant periodic rate of interest on the remaining balance of the liability for each period. The property, plant and equipment acquired under finance leases is depreciated over the period of the asset’s useful life and the lease term if there is no reasonable certainty that AARNet will obtain ownership at the end of the lease term.

AARNet may, as described in note 20, enter into arrangements which are considered off-setting finance leases. Such leases are considered to be settled immediately after coming into effect with the result that no finance cost, or finance income is recognised, and no finance liability or receivable remains outstanding. Assets acquired under such arrangements are depreciated over the shorter of the asset’s useful life or the lease term.

Leases in which a significant portion of the risks and rewards of ownership are not transferred to AARNet as lessee are classified as operating leases. Payments made under operating leases (net of any incentives received from the lessor) are charged to the Statement of Surplus on a straight-line basis over the period of the lease.

Goods and Services Tax (GST)

Revenues, expenses and assets are recognised net of the amount of associated GST, unless the GST incurred is not recoverable from the Australian Taxation Office (ATO). In this case it is recognised as part of the cost of acquisition of the asset or as part of the expense.

Receivables and payables (except accrued expenses) are stated with the amount of GST included.

The net amount of GST recoverable from, or payable to, the ATO is included in the asset or liability in the Balance Sheet.

Cash flows are included in the Statement of Cash Flows on a gross basis. The GST component of cash flows arising from investing and financing activities which are recoverable from, or payable to, the ATO are classified as operating cash flows.

Comparative figures

Comparative figures have been adjusted to conform to the presentation of the financial year, where required.

Investments and other financial assets

The accounting policies for the group’s revenue from investments and other financial assets are explained in Note 8.

New Accounting Standards and Interpreations not yet mandatory or early adopted

For the annual reporting period ended 31 December, 2018, Australian Accounting Standards and Interpretations that have recently been issued or amended are not yet mandatory and have not been early adopted by AARNet. AARNet’s assessment of the most relevant new or amended Accounting Standards and Interpretations are set out below.

AASB 26 Leases (AASB 16)

This standard is applicable to annual reporting periods commencing on or after 1 January 2019. The standard replaces AASB 117 Leases and for lessors will eliminate the classification of operating leases and finance leases. The new standard requires the lessor to recognise its leases in the Balance Sheet as an asset (the right to use the leased item) and a liability reflecting future lease payments. Depreciation of the leased asset and interest on lease liability will be recognised over the lease term.

AARNet will be applying AASB 16 from 1 January 2019.

AARNet (with assistance from engaged advisors) has completed a preliminary assessment on AASB 16 and is currently understanding the financial statement impact of this new standard. The key impacts identified to date are in respect to the recognition of operating leases as right of use assets and operating lease liabilities in Balance Sheet. AASB 16 effects the timing of lease expenses, with the amount of expense recognised at the beginning of the lease to be higher than under previous lease standards, resulting, for a particular lease, a decrease in Net Surplus in the early periods of the lease. The magnitude of the financial impacts on transition and on the comparative financial year is yet to be determined, as a result, at this time AARNet cannot make a reasonable quantitative estimate of the effects of the new standard.
DIRECTORS’ DECLARATION

In the Directors’ opinion:

(a) the financial statements and notes set out on pages 8 to 31 are in accordance with the Australian Charities and Not-for-profits Commission Act 2012, including:

(i) complying with Accounting Standards and other mandatory professional reporting requirements, and

(ii) giving a true and fair view of the entity’s financial position as at 31 December 2018 and of its performance for the year ended on that date, and

(b) there are reasonable grounds to believe that the Company will be able to pay its debts as and when they become due and payable.

This declaration is made in accordance with a resolution of Directors.

[Signatures]

Engage Professor OR Burton AO
Chairman
Sydney
19th March 2019

M CM Hancock
Director

Independent auditor’s report

To the members of AARNet Pty Ltd

Our opinion

In our opinion:

The accompanying financial report of AARNet Pty Ltd (the Company) is in accordance with Division 60 of the Australian Charities and Not-for-profits Commission (ACNC) Act 2012, including:

(a) giving a true and fair view of the Company’s financial position as at 31 December 2018 and of its financial performance for the year then ended

(b) complying with Australian Accounting Standards and Division 60 of the Australian Charities and Not-for-profits Commission Regulation 2013.

What we have audited

The financial report comprises:

• the balance sheet as at 31 December 2018

• the statement of surplus for the year then ended

• the statement of changes in equity for the year then ended

• the statement of cash flows for the year then ended

• the notes to the financial statements, which include a summary of significant accounting policies

• the directors’ declaration.

Basis for opinion

We conducted our audit in accordance with Australian Auditing Standards. Our responsibilities under those standards are further described in the Auditor’s responsibilities for the audit of the financial report section of our report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.
**Auditor’s responsibilities for the audit of the financial report**

Our objectives are to obtain reasonable assurance about whether the financial report as a whole is free from material misstatement, whether due to fraud or error, and to issue an auditor’s report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the Australian Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial report.

A further description of our responsibilities for the audit of the financial report is located at the Auditing and Assurance Standards Board website at: http://www.auasb.gov.au/auditors_responsibilities/ar4.pdf. This description forms part of our auditor’s report.

PricewaterhouseCoopers

Scott Walsh
Partner
Sydney
19 March 2019

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**Independence**

We are independent of the Company in accordance with the ethical requirements of the Accounting Professional and Ethical Standards Board’s APES 110 Code of Ethics for Professional Accountants (the Code) that are relevant to our audit of the financial report in Australia. We have also fulfilled our other ethical responsibilities in accordance with the Code.

**Other information**

The directors are responsible for the other information. The other information comprises the information included in the annual report for the year ended 31 December 2018, but does not include the financial report and our auditor’s report thereon.

Our opinion on the financial report does not cover the other information and accordingly we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial report, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial report or our knowledge obtained in the audit, or otherwise appears to be materially misstated.

If, based on the work we have performed on the other information that we obtained prior to the date of this auditor’s report, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

** Responsibilities of the directors for the financial report**

The directors of the Company are responsible for the preparation of the financial report that gives a true and fair view in accordance with Australian Accounting Standards and the Australian Charities and Not-for-profits Commission (ACNC) Act 2012 and for such internal control as the directors determine is necessary to enable the preparation of the financial report that gives a true and fair view and is free from material misstatement, whether due to fraud or error.

In preparing the financial report, the directors are responsible for assessing the ability of the Company to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the Company or to cease operations, or have no realistic alternative but to do so.