



REANNZ ANNUAL REPORT

Year ended 30 June 2019

REANNZ

CONTENTS /

Our vision and mission	3
Our achievements 2018–2019	4
Board Chair’s report	5
Chief Executive’s report	7
Case studies	8
About REANNZ	
> Our Board	12
> Our role	14
> Our value	14
> Our users	15
> REANNZ national network	16
> Our global role and relationships	17
> Global research and education network	18
> Our products and services	20
End of Year reporting	
> Statement of responsibility	21
> Independent Auditor’s report	22
> Governance statement	25
> Good employer statement	27
> Performance framework	28
> Statement of performance	30
Financial statements	41
Notes to the Financial statements	45
REANNZ members as at 1 July 2019	60

Presented to the House of Representatives under Sections 150–157 of the *Crown Entities Act 2004*.

REANNZ is the Research and Education Advanced Network New Zealand.

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OUR VISION /

Seamlessly connecting New Zealand researchers, innovators and educators to each other and their global community.



OUR MISSION /

Enabling New Zealand's research, education and innovation sectors to thrive through the provision of a tailored specialist digital infrastructure, support and services to meet their specialist needs.



OUR ACHIEVEMENTS 2018-2019 /



99.99999%
packet delivery

(ie 1 packet lost per
13,679,891 packets sent)

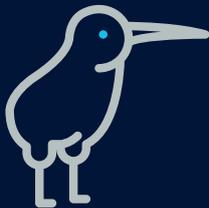


72+
Petabytes

transferred over the
REANNZ network



>99.99%
national network
availability



+51% increase

in national
traffic volumes



99.89%

international network
availability (Hawaiki Cable)



100%

international network
availability - Australia



350,000

researchers, academics,
education innovators, staff
and students have access
to REANNZ's network



35%

total traffic
growth
year-on-year



70,974
devices

no. of unique device
connections in NZ made
via eduroam

BOARD CHAIR'S REPORT /

I am pleased to present my first Annual Report as Chair of REANNZ.

This year has seen significant change and work to realign and refocus REANNZ, to meet the current and future needs of its members and New Zealand's e-research sector.

Our people

REANNZ now has a substantially new governance team. The Shareholding Minister, Hon Dr Megan Woods appointed four new directors to Board in October 2018: Sara Brownlie, Dr Judith Johnston and David Skinner, including myself as Chair. These appointments bring strong skills in management, finance, governance and network economics to the Board. In addition, in September 2019, the Minister appointed two further directors: Liz Gosling, CIO at AUT and Professor Jim Metson, Deputy Vice-Chancellor Research at the University of Auckland, who both bring strong sector knowledge and experience. Board subcommittees have been established to progress priority work areas.

There has also been considerable change within REANNZ's management. The Chief Executive, Nicole Ferguson, resigned in March choosing not to return after her parental leave. I would like to acknowledge her significant work and commitment during her nine years at REANNZ, including three as CEO. I would also like to thank our Acting CEOs: Gerrit Bahlman (who stood down following ill health), David Skinner (on a part-time basis), and latterly Neil Fenemor (REANNZ Manager of Technology and Architecture).

In August 2019 we welcomed the incoming Chief Executive, Dianna Taylor, who is a capable leader and brings strong strategic and engagement skills within a technical environment. We were pleased to have Member representation during the recruitment process. We look forward to working with Dianna.

Our Members

We are delighted that New Zealand's university sector has agreed as a group to remain as members of REANNZ



REANNZ Chair Janine Smith, MNZM

from July 2019 and welcome the three universities who had withdrawn last year. I would like to acknowledge the substantial work by and with members to develop a new Member Services Agreement with core members from universities and Crown Research Institutes, respectively.

We currently have 45 members drawn from the research, education and innovation communities.

Our work

The past year has focused on ensuring REANNZ is cost-effective, member-focused, and future-fit, ready to meet the needs of our members and the sector.

This work includes a REANNZ-initiated project to review the costs of the network and to identify how else the network may be used to increase scale and gain greater cost efficiencies for members. This work continues to inform decision-making and to seek further efficiencies to benefit members.

REANNZ also reviewed its products and services in consultation with member representatives, which resulted in REANNZ offering a new approach to its service bundles. We also worked closely with members in selecting a good, well-priced interim network resiliency option between New Zealand and Australia.

REANNZ contributed considerable time and effort across many months to inform the Sapere report, commissioned by MBIE. We were pleased the report reaffirmed the importance of our network as New Zealand's designated National Research and Education Network (NREN). The report identified some areas for development, with many either underway, under future consideration or already completed. REANNZ continues to work with MBIE to identify options for a sustainable financial future.

REANNZ network

In addition to the above work, notable achievements include the acceptance and operationalisation of the Hawaiki Cable capability. It provides for the first time, direct connectivity between New Zealand and the USA and enables international collaborations. For example, Duke University (USA) is working with the Dunedin Study at the University of Otago to analyse MRI brain slices to study the impact of ageing on the brain. Over 38 Million MRI slides were synchronised between the two institutions within a single month.

With the implementation of the Hawaiki Cable, we have also been able to reduce the cost of non-research internet for members.

REANNZ completed the upgrade of our national backbone network, which stretches from Invercargill to Mangawhai in Northland, where it connects to the Hawaiki Cable. In the North Island, both sides of the network run at a full 100 gigabits per second (Gbps) data transfer speed. This follows a second connection being put in place between Hamilton and Wellington to provide dual resiliency. The primary South Island network runs at 100Gbps on its primary path from Dunedin to the North Island. This step change in capability means that REANNZ is ready and able to support the exceptional growth in international collaboration by members.

REANNZ network continued to see strong growth with 35% total traffic growth year-on-year. Over 72 petabytes were transferred over the REANNZ network last year.

REANNZ organised a very successful meeting of National Research and Education Networks (NRENs) from the Asia Pacific region at APAN46, which was held in Auckland and attracted over 300 representatives. We appreciated having the Minister for Research, Science and Innovation, Hon Dr Megan Woods open the event. APAN was last hosted in New Zealand in 2008.

During the year we were pleased to see that MBIE's call for data science investment funding required applicants to have access to an advanced network in order to be eligible to apply. This consistent approach across government, industry and the sector will benefit the investment that has been made in the REANNZ network through increased usage at a lower marginal cost.

Looking forward

A key focus of 2019-2020 will be to initiate and support the community collaborative framework, as set out in the Member Services Agreement.

We will work to increase all stakeholders' understanding of the REANNZ network and the benefits of being a member of the global NREN community.

We will continue to demonstrate our value to the sector and to deliver the most cost-effective, high-quality service possible to members.

We will continue to look at options to increase efficiency and scale. We also want to resolve REANNZ sustainability through improved funding mechanisms.

Finally, my thanks to my fellow Directors and to the REANNZ team for their energy and commitment to support the work of New Zealand's science, research, education and innovation community. We are proud of the work and considerable progress made this year.

Lastly, and most importantly, we thank you - our members - for your support over an important year while we reposition REANNZ to meet the current and future needs of our members.



Janine Smith MNZM
Chair

CHIEF EXECUTIVE'S REPORT /

Kia ora tātou

As the new Chief Executive I am delighted to join REANNZ and look forward to working with the Board and members to lead the organisation through this next phase of its development.

A key focus for the year is to develop and implement the community collaborative framework, which is set out in the agreement with our core members. I look forward to actioning our commitment to establishing a group, to ensure a more open, transparent and consultative approach to key investment and strategic decisions. I also want to ensure REANNZ is aligned and has the capability and capacity to meet the current and future needs of members and the eResearch community.

We have also committed to providing more value to our members and to increase their understanding of how we support and enable data-intensive research. Our new website provides a greater depth of information about our organisation, our priorities and our products and services. It is a good first step on this journey.

In my first weeks I have been impressed by the passion and commitment of the REANNZ team and Board to support and enable data-intensive research and collaboration within New Zealand and across the globe. And this same commitment is evident in my meetings so far with members of the university and CRI sectors, and the wider research and education community.

I look forward to meeting many more members and to working with you over the coming year.

Ngā mihi



Dianna Taylor
Chief Executive



Dianna Taylor, Chief Executive

CASE STUDY /

Designing a firewall solution for a complex multi-campus polytechnic.

The Wellington Institute of Technology (WelTec) and Whitireia Community Polytechnic were looking for a firewall solution that would deliver consistent, high-quality internet access across their campuses. They wanted to improve network performance, allow better connectivity, improve security and reduce their technical footprint.

Both the Firewall as a Service (FaaS) project and implementation were highly complex. At the time, it involved ten campus networks, two old firewall products and four geographically dispersed firewall clusters. The project was part of a larger programme of work which included the opening of Te Auaha (a new smart server-less building), rolling out Wi-Fi as a Service, upgrading WAN hardware, replacing the LAN, and changing the WAN infrastructure from a switching (layer 2) to a routed (layer 3) network.

Paul Fallon describes the project as, "a bit like undergoing open heart surgery whilst playing football."

The shared WelTec and Whitireia ICT Services department approached REANNZ. They were aware that GNS had already successfully implemented REANNZ's managed firewall. They needed a trusted partner that was flexible, cost effective and highly competent.

The solution

Together, we workshopped options. REANNZ then developed an in-house tool to translate and automate firewall configurations into the FortiGate solution (a next-generation firewall), saving months of work.

FortiGate's policy-based traffic filter restricts traffic to that which is permitted by the organisation. It reports usage and flow information, which WelTec and Whitireia use to continuously improve security. The resulting firewall service provides a managed highly-available environment, a consistent rule-based policy across

"With REANNZ, we have a trusted partner who is flexible, cost effective and highly competent. I can pick up the phone and talk directly with a networking expert who knows us and understands our network."

- Paul Fallon
Chief Digital Officer,
WelTec and Whitireia

all devices, and the underlying firewall technology is continually monitored and maintained. In addition, we merged the security zones for all staff and students across the two polytechnics which terminate on the managed firewall.

REANNZ provides the resilient WAN connectivity for both WelTec and Whitireia polytechnics to REANNZ's Points of Presence (PoPs) where the firewall service is hosted. Their main campuses have dual 10Gbps links to REANNZ that provide redundant connectivity. They can talk to REANNZ's different PoPs and data can travel over two different paths to get to their Infrastructure as a Service (IaaS) platform which runs in a Hamilton data centre.

All Whitireia and WelTec servers and services are run out of this data centre, including the telephone system. The result is virtually no jitter, very low latency and no additional networking contracts or connections as REANNZ peers directly with a telco to transit all telephone calls through the REANNZ network.

"We took REANNZ's advice and do not get in the way of network traffic and don't restrict performance with traffic shaping or proxy servers. Consequently, we've seen an increase in network performance, a decrease in complaints about internet speeds, and some more cost savings."

"Firewall as a Service not only increased connectivity and security, it enables one network engineer to manage all the campuses and the data centre," says Paul Fallon. "In addition, REANNZ engineers saved \$20K in hardware upgrade costs by re-architecting the network slightly differently to require less expensive software licensing. That's not the sort of thing that would be offered up by a vendor in a commercial setting."

In today's digital world, interconnectivity between geographically dispersed campuses is vitally important. The WelTec and Whitireia firewall service provides an innovative model of secure and seamless connectivity.

"Taking an 'as a service' approach to Wide Area networking and firewalling has meant that we can depend on recognised experts being focused on this technology



and responding to threats 24/7, enabling us to focus on getting more from our ICT investment."

A future national model

Looking ahead, Paul Fallon says the REANNZ Firewall as a service model that WelTec and Whitireia have implemented could be extended to provide a potential future platform to join more polytechnic networks together to provide a seamlessly interconnected experience.

"Under a one national polytech model, high quality interconnectivity between campuses across the country is going to be vitally important, as is security. A Firewall model may be required that can span the whole country."

CASE STUDY /

Climate modellers transfer 11 terabytes in 24 hours



Jonny Williams

11 terabytes is a lot of data in anyone's language. It's roughly equivalent to 5.5 million hours of standard definition film, 3.4 million photographs or 2.2 million songs.

The mammoth transfer of numerical climate data is part of NIWA's ongoing work with the UK Met Office and Korea Meteorological Administration, in joint research for the sixth UN Intergovernmental Panel on Climate Change Assessment Report (IPCC AR6).

Jonny is working with NIWA colleagues Guang Zeng and Olaf Morgenstern to set up and run several atmospheric simulations. Their simulations are among hundreds from modelling centres around the world that will feature in the IPCC's next weighty assessment report.

He automated the big 11-terabyte data transfer as around 40 separate transfers that ran over the course of a single day. The simulations themselves relate specifically to how chemical species in the atmosphere such as ozone will change in the future because of emissions from human activity.

"When NIWA climate scientist Dr Jonny Williams sent a massive 11 terabytes of data to research counterparts in the UK, he didn't give the size of the transfer a second thought. The REANNZ advanced network seamlessly delivered the entire dataset within 24 hours, and without scrambling or dropping data."

Contrary to what you might expect, there are no major challenges involved in a data transfer this big. It's dead easy, says Jonny. So much so that he didn't give the size of the transfer a second thought. That's all down to the quality of the specialist REANNZ network, as well as NeSI's data transfer platform and Globus software used to send and receive data.

REANNZ is New Zealand's advanced National Research and Education Network (NREN). It works seamlessly with over 120 NRENs to provide a specialist international network architected for the unique needs of data-intensive research traffic. NRENs are designed to deal with big data, so there is negligible congestion and therefore no jitter or packet loss.

Jonny has been using the REANNZ network on an almost daily basis for around the last two years. He says advanced networks like REANNZ are transformational in letting researchers collaborate faster and more effectively. He likens them to the difference between a mobile phone from the early

2000s and a modern smartphone in making researchers' lives easier and enabling new applications.

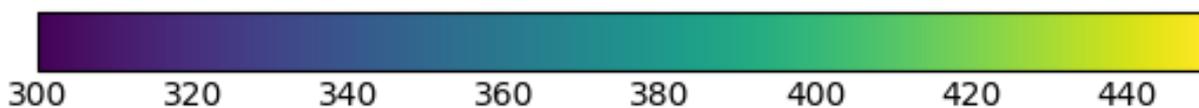
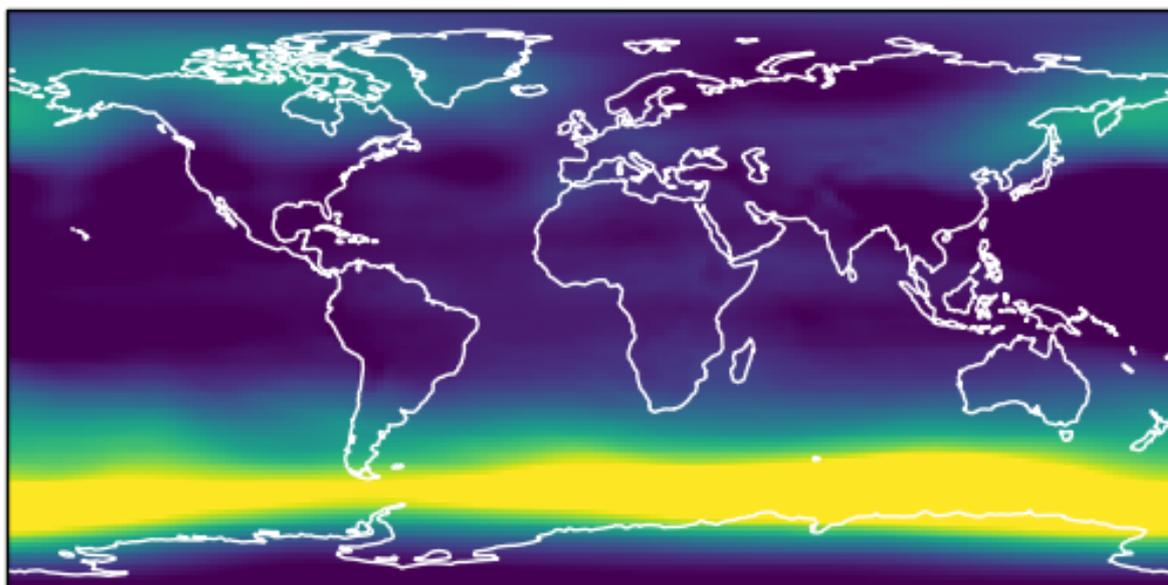
"Without REANNZ's high-speed data transfer network we wouldn't be able to transfer this amount of data this quickly. It's that simple. What took us one day could easily have taken months without REANNZ.

"If you can do something faster, it accelerates your workflow. But sending and receiving large data sets quickly also completely transforms your workflow."

It's not just about sending data. Climate modellers like Jonny, Guang and Olaf equally rely on the speed and reliability of advanced networks to receive large amounts of information from other researchers around the globe.

Engineers from REANNZ say in total the full transfer over the advanced network amounted to 25 terabytes over three days.

Total column preindustrial ozone for October (Dobson units)



Credit: NIWA staff writer Campbell Gardiner

ABOUT REANNZ /

REANNZ Board of Directors

There has been considerable change to the Board during 2018-2019, with a new Chair and three new directors appointed, and an additional two new directors joining in September 2019.



Janine Smith MNZM, Chair

Janine Smith MNZM, was appointed a Director and Chair of REANNZ in November 2018.

She is an experienced chief executive and senior director with experience in publicly-listed, private and Crown-owned companies. Janine is currently Chair of AsureQuality Limited, Executive director of The Boardroom Practice Ltd, the independent member of Fonterra's Governance Development Committee, a member of the AUT University Council, President of London Business School Auckland chapter and a director of several private companies. She was awarded a Member of the New Zealand Order of Merit in 2015 for services to corporate governance. Janine is appointed until 30 June 2021.



Ross Peat, Deputy Chair

Ross is Executive Director and co-owner of health technology companies HealthSoft New Zealand Ltd and HealthSoft Australia Ltd, and a director of AUT Enterprises Ltd. He is a Founding Investor of the Tuhua Fund (angel and early stage investment), a member of the Ice Angels and sits on the Ice Angels Deal Flow Committee. Ross' appointment has been renewed until 30 June 2021.



Sara Brownlie

Sara is the Managing Director of Fargher Woods Ltd, an Independent Director for Catalyst.net Ltd and Independent Member of the Risk and Assurance Committee for Upper Hutt City Council. She is a Fellow Member of CPA Australia and a Chartered Member of the Institute of Directors in New Zealand and the Chartered Accountants Australia and New Zealand. Sara has had an extensive career working in senior financial management roles in the public sector. Sara is appointed until 30 June 2021.



Liz Gosling

Liz is the Chief Information Officer at Auckland University of Technology (AUT). She brings three decades of experience in the IT sector in New Zealand, the US, UK and Europe. She was a Director and faculty member of the Council of Australasian University Directors of Information Technology (CAUDIT) Leadership Institute in Australia, and the New Zealand invited representative on the CAUDIT Executive. Liz has chaired the Universities NZ Information and Communications Technology Committee and last year was re-elected Chair of TUANZ. Liz is appointed until 30 June 2022.



Dr Judith Johnston, Audit and Risk Committee Chair

Judith is an independent management consultant with significant senior executive experience in the public and private sectors. She is currently a Commissioner on the Library Information Advisory Commission and a former board member of the New Zealand Qualifications Authority and the Tertiary Education Commission. In addition, Judith is a member of governance boards and audit and risk committees for major government agencies, and convenes a number of professional conduct committees under the Health Practitioners Competency Assurance Act. Judith is appointed until 30 June 2020.



Professor Jim Metson

Professor Jim Metson is the Deputy-Vice Chancellor (Research) at the University of Auckland. He was a founding member of the MacDiarmid Institute for Materials Science and Nanotechnology, a co-founder of the University of Auckland Research Centre for Surface and Materials Science and of the Light Metals Research Centre, where he is currently an Associate Director. Jim served as Chief Science Advisor to MBIE, chaired the MoRST Research Infrastructure Advisory Group and represented the New Zealand government on the Australian National Science Advisory Committee that oversaw the development of the Australian Synchrotron. Jim is appointed until 30 June 2022.



David Skinner

David is an executive director of Gravelroad Consulting specialising in infrastructure and public policy risk economics. He has had a management career in telecommunications, electronic banking, and defence. Previous positions include Managing Director of Netway, Hypercom, and COO positions in Clear Communications. He has lived and worked previously in the UK, Europe, and Australia. He holds a BE from Canterbury University and an MBA from Auckland University and is an associate fellow of the NZIM. David is appointed until 30 June 2021.



Professor Emeritus Steve Weaver, People and Culture Committee Chair

Steve was previously the Deputy Vice-Chancellor (Research) at the University of Canterbury. He serves on the Board of GNS Science Ltd, is a member of the Governance Group of the Resilience National Science Challenge and is a Fellow of the Royal Society of New Zealand. Steve is appointed until 30 June 2020.

ABOUT REANNZ /

Our Role

REANNZ, the Research and Education Advanced Network New Zealand, is New Zealand's National Research and Education Network (NREN).

Established in 2005, we are a not-for-profit Crown-owned company under Schedule 4A of the Public Finance Act 1989. Our Shareholding Ministers are the Minister of Finance and the Minister of Research, Science and Innovation.

Governance is provided by an independent Board of Directors appointed by the Ministers. REANNZ is funded through MBIE's Strategic Science Investment Fund (SSIF) and by our member organisations.

REANNZ operates and supports a specialist high-performance digital network that is engineered to meet the unique performance demands of scientists, researchers, innovators and educators. It's used by researchers to access, move and share data-intensive research around the country and across the world, enabling them to collaborate and contribute to world-leading research to benefit New Zealand and the world.

REANNZ engineers also develop and support solutions to address complex technical issues in this specialist environment.

Our small team supports 45 member organisations from New Zealand's universities, Crown Research Institutes, institutes of technology and polytechnics, wānanga and the wider education, research and innovation sector.

We are an active member of the international community made up of over 120 National Research and Education Networks (NRENs). REANNZ and these national networks have agreed protocols and settings which enables them to provide a seamless international research infrastructure to enable traffic to transit to or through their countries.

Globally, research is becoming increasingly data-intensive. REANNZ ensures New Zealand can not only participate, but remain at the competitive edge of science and research. This has important implications for New Zealanders, as the work done by our research

communities leads to innovations in areas such as climate change, healthcare, natural hazards, genomics, and agriculture.

Today, a dedicated and high-performance specialist research and education network is a signal of a country's commitment to, and value placed on, data-intensive science. The New Zealand government now requires applicants for data science research funding to have access to an advanced network.

Accessing the research, education and innovation infrastructure required to pursue and achieve excellence creates a ripple effect, attracting more funding, more talent, greater international collaboration and new breakthroughs. This positive cycle delivers benefits to New Zealand and for all New Zealanders through improved social, cultural, economic and environmental outcomes.

"REANNZ network is like a private motorway for research and education traffic – it cuts transfer times for big data from months to weeks, and from days to minutes."

Our Value

REANNZ's high performance network enables researchers to connect, collaborate and contribute to world-leading research to benefit New Zealand and the world.

- › REANNZ's network overcomes the distance and enables New Zealand scientists and researchers to take their place on the world stage and contribute to, or lead, data-intensive global research projects to address pressing issues.

- › REANNZ members are part of a private community of 120 countries (NRENs) who together provide a seamless, high-performing global research and education network, on a not-for-profit basis, to support researchers globally.
- › REANNZ's network is built to meet the unique needs of big science and research data - it delivers massive transfers at high speed, with low latency (minimal delays) and no packet loss (no data loss).
- › Members have direct access to REANNZ's team of specialist network engineers for advice and support and to help resolve any issues encountered with other NRENs.
- › It's a prerequisite to collaborate and to receive funding - top international research institutes will only collaborate with organisations of a similar standard and expect access to a specialist R&E network. NZ researchers need access to an advanced network to be eligible for MBIE data science funding.

Our users

- › Data-intensive researchers use REANNZ network to share their work with collaborators around the country and the world, and to access data from international research libraries eg. researchers working in climate change, earthquake research, genomics, and engineering.
- › Researchers/organisations who stream traffic in real time or near to real time eg GNS use the REANNZ network for their 24/7 National Geohazards Monitoring Centre (which includes GeoNet, tsunamis, volcanoes and landslides).
- › NIWA monitors extreme weather events, and radio astronomers can study celestial events as they occur.
- › Members leverage off the REANNZ network to connect with the cloud service provider of their choice including AWS, Azure, Google.
- › International researchers access New Zealand's world-leading research including research on Antarctica, unique species, geological and earthquake research, engineering, and Māori and Pasifika research.

See the full list of members on page 60.

Seattle
Portland (Oregon)

Sydney

Hawaiki Cable

Los Angeles

REANNZ NATIONAL NETWORK MAP

(as at August 2019)

NB lines are indicative only

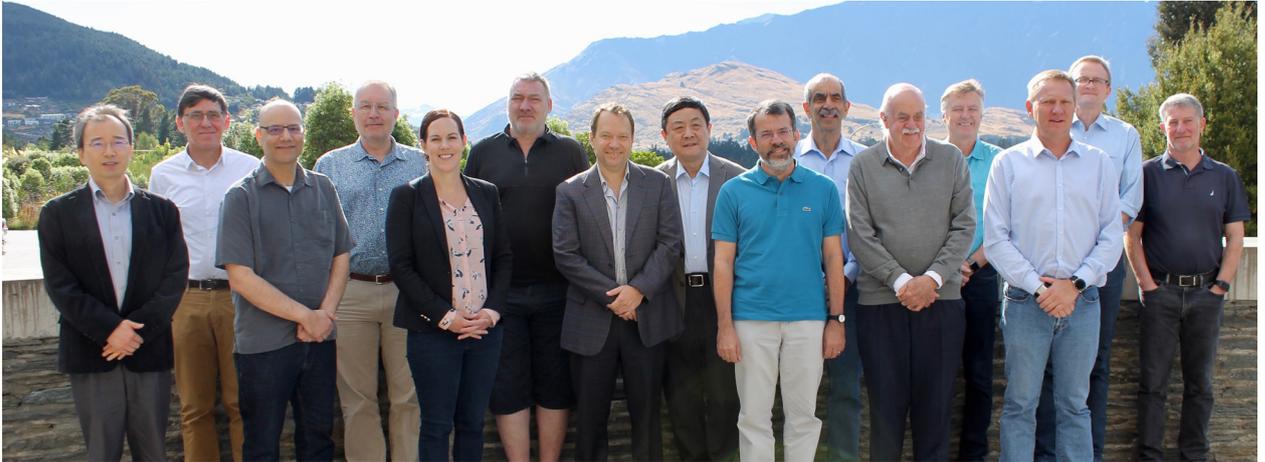
- 100Gbps national backbone network
- 20Gbps and under
- Hawaiki Cable

These lines are indicative only and do not show precise routes.



ABOUT REANNZ /

Our global role and relationships



REANNZ was proud to host the international forum of NREN CEOs in 2019.

As New Zealand's designated national research and education network (NREN), REANNZ is a member of the global community of over 120 NRENs who together provide a seamless international network to support the specialist needs of this community.

These NRENs have long-established working relationships, and have over time developed shared practices and operational protocols, which enable them to work together to transfer data between researchers, research organisations and libraries, around the world.

In effect, NRENs simply "hold hands" to create a high-performance network infrastructure. Together they enable data-intensive traffic to transfer to or from their NREN or to transit through their NREN to a further destination.

The international research and education network enables researchers to connect with their peers nationally and internationally. It supports research collaborations, and facilitates massive data transfers. New Zealand researchers at the southern-most NREN in the world are able to participate in and play an active role in addressing global issues.

Because of this global network of NRENs, New Zealand researchers gain access to a worldwide, multi-billion-dollar research and education infrastructure, dedicated to the pursuit of science, research and education.

Globally, research and education networks are 'closed systems'. This is because each NREN develops and maintains the cost of their national infrastructure with the understanding and expectation that it will be used by other NRENs. They send and receive traffic between each other, at no cost to other parties.

The global advanced network community also develops and manages services for the use of all NREN members. These services include eduroam (education roaming: the secure, worldwide wifi roaming access service developed for the international research and education community) and eduGAIN (the global federated identity management system).

REANNZ actively participates in the international forum of NREN Chief Executives and was proud to host the Forum in New Zealand in February this year.

REANNZ is an active member of APAN - the Asian Pacific Advanced Network which connects, coordinates and shares research, technological and other interests for NRENs in the Asia and Oceania regions.

We also work closely with GÉANT and Internet2 which coordinate and represent the European and US regional NREN communities respectively, as well regional and individual NRENs.

GLOBAL RESEARCH AND EDUCATION



REANNZ INTERNATIONAL NETWORK

[as at August 2019]

NB lines are indicative only

These lines are indicative only and do not show precise routes.

COMMUNICATION COMMUNITY /



ABOUT REANNZ /

Products & Services

REANNZ develops and supports a range of products and services to support the specialist needs of our members in the R&E and innovation community.

Managed Access and Edge - Connecting member's local network with the REANNZ network

Edge devices, including switches and routers, connect a member's local network with the REANNZ network, enabling members to transfer data. Members use either a REANNZ managed edge device or manage this entry point themselves.

REANNZ managed edge devices are engineered and configured for high performance, and where required high availability, to meet the specialist needs of the research community when transferring large volumes of data. This offering is called Managed Access and Edge (MAE).

Managed Firewall Service - Creating a secure perimeter

A well-managed firewall protects the security of your organisation by allowing only authorised traffic into your environment while facilitating collaboration and data sharing with external research partners.

The REANNZ managed firewall service is designed to meet the specialist performance, protection, visibility and information requirements of members, and the wider research and education community.

Science DMZ - A scalable network design model to optimise science data transfers.

Science DMZ provides a frictionless on-ramp and path across REANNZ and the international research and education network, to facilitate the transfer of large volumes of data, from multi-gigabyte to petabytes and terabytes, all while retaining the integrity of the data.

The Science DMZ is scalable, incrementally deployable, and easily adaptable to incorporate high performance and advanced technologies such as 100 Gigabit network services and virtual circuits.

Tuakiri - Federated identity management.

Tuakiri provides trusted and secure federated identity and access management services for students, academics,

researchers and staff from New Zealand's research, science, innovation and education sectors to online content.

Cloud Connect - Leverage off your REANNZ network to connect with your cloud service provider.

REANNZ Cloud Connect Service enables members to use their existing high-performance REANNZ network connection to connect with the cloud service provider of their choice, achieving considerable cost savings and efficiencies for their organisation.

REANNZ Cloud Connect Service connects your cloud service provider and data centre, head office, or co-location environment.

eduroam - Secure, world-wide roaming wifi service

eduroam is a free, secure, world-wide roaming wifi service available for REANNZ members. It provides researchers, staff and students from participating institutions with wifi across campus and when visiting other participating institutions by simply opening their laptop, or turning on their phone.

Today, 30 New Zealand institutions are using and providing eduroam with about 18,000 unique devices using eduroam in New Zealand each month. It's also available in 101 countries and over 10,000 hotspots around the world.

Professional Services

Our highly-skilled engineers and consultants work with members as their organisation evolves to ensure the organisation's capability meets the growing requirements of their researchers, educators and staff.

Our objective is always to support our member's goals and find solutions that work best for them. For this reason we are product and supplier agnostic. A technical solution is never 'one size fits all'. We work together with IT staff and management within the member organisation's to do current state and capability assessments which inform the products we recommend.

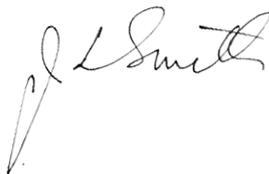
Statement of Responsibility

The Board of REANNZ accept responsibility for the preparation of the annual financial statements and statement of performance, and for the judgements made in them.

The Board is responsible for any end-of-year performance information provided by REANNZ under Section 19A of the Public Finance Act 1989.

The Board and management of REANNZ accept responsibility for establishing and maintaining a system of internal control designed to provide reasonable assurance as to the integrity and reliability of the financial reporting.

In the opinion of the Board, the financial statements and statement of performance fairly reflect the financial position and operations of REANNZ for the year ended 30 June 2019.



Janine Smith, MNZM
Chair



Dr. Judith Johnston
Audit & Risk Committee Chair

17 October 2019
Signed on behalf of the Board

INDEPENDENT AUDITOR'S REPORT /

To the readers of Research and Education Advanced Network
New Zealand's financial statements and performance information
for the year ended 30 June 2019

The Auditor-General is the auditor of Research and Education Advanced Network New Zealand (REANNZ). The Auditor-General has appointed me, Andrew Clark, using the staff and resources of Audit New Zealand, to carry out the audit of the financial statements and the performance information, of REANNZ on his behalf.

Opinion

We have audited:

- the financial statements of REANNZ on pages 41 to 59, that comprise the statement of financial position as at 30 June 2019, the statement of comprehensive revenue and expense, statement of changes in equity and statement of cash flows for the year ended on that date and the notes to the financial statements including a summary of significant accounting policies and other explanatory information; and
- the performance information of REANNZ on pages 30 to 40.

In our opinion:

- The financial statements of REANNZ on pages 41 to 59:
 - present fairly, in all material respects:
 - its financial position as at 30 June 2019; and
 - its financial performance and cash flows for the year then ended; and
 - comply with generally accepted accounting practice in New Zealand in accordance with Public Benefit Entity Reporting Standards.
- The performance information on pages 30 to 40:
 - presents fairly, in all material respects, REANNZ's performance for the year ended 30 June 2019, including:

- for each class of reportable outputs:
 - its standards of delivery performance achieved as compared with forecasts included in the statement of performance expectations for the financial year; and
 - its actual revenue and output expenses as compared with the forecasts included in the statement of performance expectations for the financial year; and
- complies with generally accepted accounting practice in New Zealand.

Our audit was completed on 17 October 2019. This is the date at which our opinion is expressed.

The basis for our opinion is explained below. In addition, we outline the responsibilities of the Board and our responsibilities relating to the financial statements and the performance information, we comment on other information, and we explain our independence.

Basis for our opinion

We carried out our audit in accordance with the Auditor-General's Auditing Standards, which incorporate the Professional and Ethical Standards and the International Standards on Auditing (New Zealand) issued by the New Zealand Auditing and Assurance Standards Board. Our responsibilities under those standards are further described in the Responsibilities of the auditor section of our report.

We have fulfilled our responsibilities in accordance with the Auditor-General's Auditing Standards.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of the Board for the financial statements and the performance information

The Board is responsible on behalf of REANNZ for preparing financial statements and performance information that are fairly presented and comply with generally accepted accounting practice in New Zealand. The Board is responsible for such internal control as it determines is necessary to enable it to prepare financial statements and performance information that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements and the performance information, the Board is responsible on behalf of REANNZ for assessing REANNZ's ability to continue as a going concern. The Board is also responsible for disclosing, as applicable, matters related to going concern and using the going concern basis of accounting, unless there is an intention to merge or to terminate the activities of the REANNZ, or there is no realistic alternative but to do so.

The Board's responsibilities arise from the Crown Entities Act 2004 and the Public Finance Act 1989.

Responsibilities of the auditor for the audit of the financial statements and the performance information

Our objectives are to obtain reasonable assurance about whether the financial statements and the performance information, as a whole, are 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 carried out in accordance with the Auditor-General's Auditing Standards will always detect a material misstatement when it exists. Misstatements are differences or omissions of amounts or disclosures, and can arise from fraud or error. Misstatements are considered material if, individually or in the aggregate, they could reasonably be expected to influence the decisions of readers, taken on the basis of these financial statements and the performance information.

For the budget information reported in the financial statements and the performance information, our procedures were limited to checking that the information agreed to REANNZ's statement of performance expectations.

We did not evaluate the security and controls over the electronic publication of the financial statements and the performance information.

As part of an audit in accordance with the Auditor-General's Auditing Standards, we exercise professional judgement and maintain professional scepticism throughout the audit. Also:

- We identify and assess the risks of material misstatement of the financial statements and the performance information, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- We obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of REANNZ's internal control.
- We evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Board.
- We evaluate the appropriateness of the reported performance information within REANNZ's framework for reporting its performance.
- We conclude on the appropriateness of the use of the going concern basis of accounting by the Board and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on REANNZ's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements and the performance information or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause REANNZ to cease to continue as a going concern.
- We evaluate the overall presentation, structure and content of the financial statements and the performance information, including the disclosures, and whether the financial statements and the performance information represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with the Board regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Our responsibilities arise from the Public Audit Act 2001.

Other information

The Board is responsible for the other information. The other information comprises the information included on pages 3 to 60, but does not include the financial statements and the performance information, and our auditor's report thereon.

Our opinion on the financial statements and the performance information does not cover the other information and we do not express any form of audit opinion or assurance conclusion thereon.

In connection with our audit of the financial statements and the performance information, our responsibility is to read the other information. In doing so, we consider whether the other information is materially inconsistent with the financial statements and the performance information or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on our work, 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.

Independence

We are independent of REANNZ in accordance with the independence requirements of the Auditor-General's Auditing Standards, which incorporate the independence requirements of Professional and Ethical Standard 1 (Revised): Code of Ethics for Assurance Practitioners issued by the New Zealand Auditing and Assurance Standards Board.

Other than in our capacity as auditor, we have no relationship with, or interests, in REANNZ.



Andrew Clark
Audit New Zealand
On behalf of the Auditor-General
Wellington, New Zealand

GOVERNANCE STATEMENT /

Organisational form

REANNZ is a not-for-profit Crown-owned company under Schedule 4A of the *Public Finance Act 1989*. Our shareholders are the Minister of Finance and the Minister of Research, Science and Innovation. At balance date, each shareholder held 908 shares on behalf of the New Zealand public.

REANNZ acts in a manner consistent with the *Crown Entities Act 2004*. REANNZ is subject to the *Official Information Act 1982*.

Role of the Board

REANNZ's Shareholding Ministers appoint a governing Board of Directors. The company's constitution sets the size of the Board at a minimum of two and a maximum of nine directors. There were four new directors appointed for the year ending 30 June 2019.

The Board is responsible under the company's constitution to manage, direct and supervise the company's business affairs. In practice, day-to-day management of the company is delegated to the Chief Executive.

The Board establishes the company's strategic and business plans, approves annual budgets and monitors management's performance against established goals. The Board also considers and approves new policies and business initiatives, authorises transactions outside the prescribed delegated authorities of management and appoints the Chief Executive. Procedures are in place at Board, corporate and operational levels to safeguard the company's assets and its wider commercial interests.

A well-established regime of regular reporting is designed to maintain a high standard of internal communication, and to ensure the Board remains appropriately informed of all aspects of the company's business and activities. Board fees are set by the Shareholding Ministers each year.

Risk management

The Board is also responsible for ensuring that the Company has effective policies in place to manage its risks. The Board decides the level and nature of the risks that are acceptable to the Company. The Chief Executive is delegated responsibility for managing normal business risks. As part of managing its broader risk profile, the Board maintains and regularly reviews a risk register, and approves and reviews all company policies.

Legislative compliance

The Board acknowledges its responsibility to ensure the organisation complies with all legislation. The Board has delegated responsibility to the Chief Executive for the development and operation of a programme to systematically identify compliance issues and ensure staff are aware of relevant legislative requirements.

Board changes during FY2019

There were two directors from 1 July to 30 September 2018, Ross Peat and Steve Weaver. Ross Peat was Acting Chair until the appointment of Janine Smith on 12 November 2018. Sara Brownlie, Judith Johnston and David Skinner were appointed to the Board from 1 October 2018.

Board meetings

The Board generally meets monthly, and these meetings are supplemented with additional meetings as required for strategic planning purposes and to progress specific decisions. The Board attended nine scheduled and four special meetings for the year ended 30 June 2019. One special meeting was to accept the Hawaiki international cable as ready for service and one was for strategic decision-making. The other two special meetings covered matters that would usually be dealt with by either the Audit & Risk or People and Culture Committees.

Board committees

The Board has formally constituted an Audit and Risk Committee to focus on audit and risk management issues and a People and Culture Committee to advise on remuneration, health and safety, and other employment-related issues. Three directors are Audit and Risk committee members and three directors are People and Culture Committee members. The Chair is a member of both.

The Board took on the role of both committees while the appointment process was underway between July and November 2018. Committee members were appointed from December 2018.

During FY2019, temporary committees were established to focus on Network Economics and Communications. There were two directors on the Network Economics Committee and one director on the Communications Committee. The Chair was a member of both. Ad-hoc meetings were held during the year as required.

Interest procedures

The REANNZ Board has a documented conflict of interest policy that sets out procedures for identifying and addressing potential conflicts of interest. This policy applies to the directors and staff of REANNZ.

The key determination when considering whether an interest might create a conflict is whether it incentivises the director or staff member to act in a way that may not be in the best interests of REANNZ. It must be determined whether a reasonably informed objective observer would perceive from the circumstances that the director or staff member's judgement is likely to be influenced.

A register of director and senior management's interests is maintained and updated regularly.

Auditor

Audit New Zealand, acting on behalf of the Controller and Auditor-General, is the auditor of REANNZ in accordance with Section 32 of the *Public Audit Act 2001*.

Registered office

Research and Education Advanced Network
New Zealand Limited
Level 5, Qual IT House
22 The Terrace
Wellington 6011

GOOD EMPLOYER STATEMENT /

REANNZ as a good employer

Policies are in place to guide REANNZ in what it means to be a good employer, and to ensure it provides equal employment opportunities.

Areas of focus are as follows:

Leadership, accountability and culture

REANNZ has a talented and dynamic team. Our culture is built upon our platinum rule: 'treat others as they would like to be treated'. We encourage all staff to lead by example, supporting others to behave in a way that is consistent with our culture and the values that we believe are crucial to our success. These values include putting the community first, integrity, responsiveness, initiative, personal responsibility and continual innovation.

Recruitment, selection and induction

REANNZ recruits new staff members through a number of channels, some through a recruitment agency and others through industry networks and recommendations. All positions are openly advertised. Prospective employees give a short presentation to REANNZ staff, allowing all staff to participate in the recruitment process and have a say in the appointment of their co-workers.

Employee development, promotion and exit

Being a small and diverse organisation, there is opportunity for continual development and experience across multiple disciplines. External training and development is also encouraged and specific budget is set aside for courses and conferences to ensure staff remain current in their field.

Remuneration, recognition and conditions

We are committed to ensuring we attract, retain and motivate high-performing people. We continue to provide an environment that identifies, encourages and rewards excellence, innovation and high-quality services by using a remuneration structure that is competitive and fair. We offer flexible working hours by agreement, to ensure all our staff have the opportunity to be successful in all aspects of their lives.

Harassment and bullying prevention

REANNZ has a published policy on harassment and bullying, and has a zero-tolerance approach. An employee assistance programme is available to all staff to enable them to get confidential support. Open communication between staff and the leadership team is supported and encouraged.

Safe and healthy environment

Health and safety is taken seriously at REANNZ, and procedures are in place to minimise risks, whether working in the office, handling network equipment or when visiting our PoP locations. Staff wellbeing is a high priority, and REANNZ offers a flexible working environment where staff are able to manage their work responsibilities around other personal commitments.

PERFORMANCE FRAMEWORK /

This performance framework shows how our output, the advanced network and related tools, enables research and education that leads to a strong research ecosystem and growing economy.

OUR VISION /

For New Zealand to be at the forefront of digitally-adv

OUTCOMES
to succeed

Outcomes

Sector Outcome

Grow the NZ economy to deliver greater prosperity and well-being for all New Zealanders.

REANNZ Outcome

To enable NZ's research, education and innovation sectors to thrive through the provision of tailored digital infrastructure, support and services.

IMPACTS
that enable

Measuring Our Impacts

Researchers across all fields are able to conduct data-intensive research

Impact measures

- > Total traffic flows increase 12% YoY (Year on Year)
- > Traffic to international research networks increase
- > > 80% users consider REANNZ network essential or valuable to their work.

OUTPUTS
deliver

Monitoring our Output

Quality measures

- > National network availability > 99.90%
- > International network availability > 99.90%
- > Packet loss < 0.0001%

Quantity measures

- > Network capacity
- > Points of presence
- > New services
- > edu roam usage

OUR OUTPUT /

The advanced research and education network and sup

anced research, education and innovation

d opportunity

ctors to
ucture,

OUTCOME SUCCESS MEASURES /

Outcome Success Measures

- › Maintain position in the Top 500 Universities per GDP in the OECD Science, Technology & Industry Outlook
- › NZ maintains its ranking for “university-industry collaboration in R&D” in the World Economic Forum global competitiveness index
- › Maintain NZ ranking for “capacity for innovation” in the WEF global competitiveness index.

e

Collaboration between science, education and innovation is enhanced

Impact measures

- › Total international traffic volumes increase 15% YoY
- › National traffic volumes increase 10% YoY

5% YoY

Users have access to the content and tools they need

Impact measures

- › Subscriptions to other services increase by 10%

measures

capacity
esence
e offering increase
page

Timeliness measures

- › > 80% members consider any issues resolved in a timely manner

Cost-effective measures

- › Membership base is maintained

pporting services

STATEMENT OF PERFORMANCE /

For the year ending 30 June 2019

The quality of our work in designing and providing a high-performance network and other services, in collaboration with our community, is key to enabling data-intensive science, research, education and innovation, which in turn impacts on the provision of a strong research ecosystem and a growing economy. Our performance framework shows how we measure and monitor success, and the impact we make.

REANNZ contributes towards New Zealand's success in global science, research, education and innovation

Outcomes

REANNZ is one of many contributors to New Zealand's high-performing and globally competitive research, education and innovation system. As with other research infrastructures, it is difficult to measure the direct impact our advanced network and services have on the country's innovation ecosystem. For this reason, we track trends for this outcome using external, publicly available indicators of the performance of New Zealand's research, education and innovation ecosystem, but we do not forecast specific changes in the trend indicators.

Outcomes	Trend Indicators	Results
<p>Sector outcome</p> <p>To build a productive, sustainable and inclusive economy and to improve the wellbeing of New Zealanders and their families.</p>	<p>Maintain position in top 500 Universities per GDP in the OECD Science, Technology & Industry Outlook.</p>	<p>This year we used a new measure from OECD Science; the cumulative ranking of all New Zealand universities in the latest QS World University Rankings.</p> <p>The cumulative ranking is 2,052. This is a 2.2% improvement from the previous ranking and a 4.5% improvement since 2017.</p> <p>The 'per country' measurements presented in prior years, from OECD Science, are no longer available.</p>
<p>REANNZ outcome</p> <p>To provide pathways and connectivity for New Zealand to be at the forefront of digitally advanced science, research, education and innovation.</p>	<p>New Zealand maintains its ranking for "university-industry collaboration in R&D" in the WEF global competitiveness index.</p>	<p>This ranking in the WEF report, ranks New Zealand 47th for the quality of research institutions. Although this ranking has fallen since 2017 (19th place), New Zealand remains in the top 35% of all countries surveyed.</p> <p>The 'per country' measurements presented from WEF global competitiveness, presented in prior years, are no longer available.</p>
	<p>Maintain New Zealand's ranking for "capacity for innovation" in the WEF global competitiveness index.</p>	<p>New Zealand improved from 27 (2017) to 20 (2018). This puts New Zealand inside the top 15% for its ability to innovate.</p>

Improvements in a country's capacity for innovation are clear indicators of its enhanced global competitiveness – these increasing trends are growing the New Zealand economy, enabling greater prosperity and opportunity for all New Zealanders. Overall, New Zealand has maintained its rankings over the past few years. As a key platform for cross-sector collaboration and facilitator of innovation, we play a key enabler role in the achievement of these results.

Measuring our impacts

The quality of our work has an external impact. We know if our work makes a difference by tracking its effectiveness through impact measures.

Impact 1 : Researchers across all fields are able to conduct data-intensive research

Globally, research is becoming increasingly data-intensive. REANNZ ensures New Zealand can not only participate, but remain at the competitive edge of science and research. This has important implications for New Zealanders, as the work done by our research communities leads to innovations in areas such as climate change, geological science, healthcare and agriculture.

This work involves scientific instruments that generate massive datasets. These datasets need to be transported quickly and accurately from the instruments to hosting or processing centres, and then shared across the globe with scientists and researchers. During a prior performance test, a large research-grade dataset was successfully sent over the REANNZ network from New Zealand to Europe in just six hours, reaching 9.98 Gbps and achieving a 99.9997% delivery quality.

An indication of the amount of data-intensive science occurring, is the amount of data transmitted over the REANNZ network as well as in our users' assessment of the network's importance and value.

Goal: Total traffic flows increase

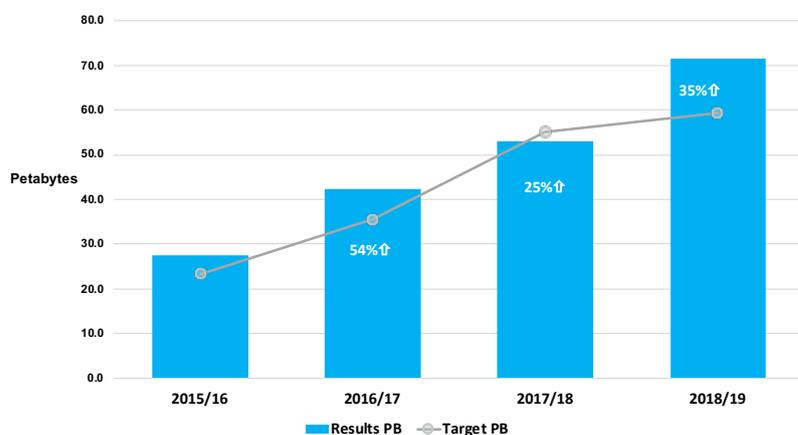
Total traffic flows increase	Result June 2018	Target June 2019	Result June 2019
Year-on-year growth	+25%	+12%	+35%
Total traffic volume	52.98 PB	59.34 PB ¹	71.56 PB

Measurements are in petabytes (PB)

REANNZ year-on-year 35% traffic growth was greater than the 12% target in the 2018-19 Statement of Performance. The target had been reduced from the 30% target because of the unknown impact of the members who discontinued their services from 1 July 2018.

The higher growth over the previous year and forecast, shows increasingly higher levels of research data being transferred over the network and high value placed by members who require high-performance data transfer solutions.

Total traffic growth



¹ The Target PB is based on prior year actual results, since that number was not included in the SPE.

REANNZ actively works with members to improve campus network performance, a key enabler of high-speed data transfer. This effort continues to enable the community to better utilise the advanced network.

Across the network, REANNZ continues to focus on improving network resilience, availability and performance through network upgrades. Domestically, we've also continued to focus on improving access to content through settlement-free peering, content caches, and increased use of services such as eduroam, all of which increase the value our network brings to the community.

Goal: Total traffic destined for international research and education networks increase

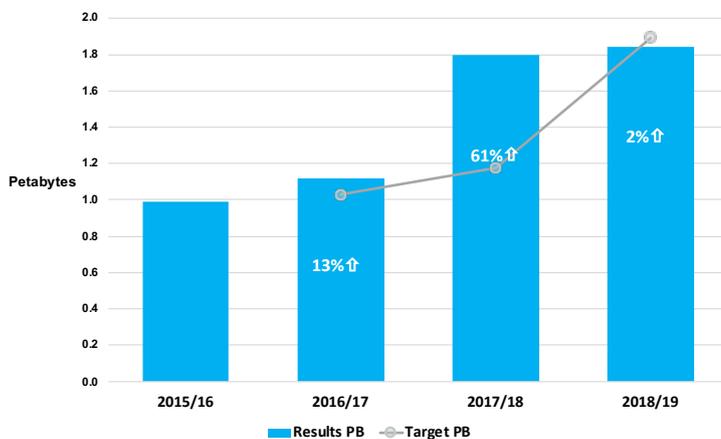
Measure	Result FY 2018	Target FY 2019	Result FY 2019
Traffic destined for international research and education increases	+61% 1.80 PB	+5% 1.89PB ²	+2% 1.84 PB

Measurements are in petabytes (PB)

Research and education traffic (traffic flowing internationally between REANNZ members and members of global NRENs) increased 2% for the year ending 30 June 2019.

The profile of the traffic being sent is important to fully understand the value and utilisation of this capability – the ability for traffic to be sent all at once is more valuable than the same amount of traffic to be sent over a longer timeframe.

International research & education traffic growth



The seemingly lower growth rate in FY2019 is a return to normal growth high rates (30%) after staggering growth in FY2018 (61%). The average for the two years FY2018 and FY2019 is 31%, and shows the increasing level of data transfers and collaboration between New Zealand and international NREN researchers.

This measure also does not include research and education activity that utilises other research and education services, such as Amazon Web Services or Microsoft Azure (which include activities such as computing, storage and analytics). Use of these services is growing and REANNZ is looking at ways to report use and profiles associated with this type of activity.

Not all traffic is equal; focusing on traffic alone does not represent the true value of high-performance international connections. The REANNZ network has performance features that make it possible for large datasets to be transferred over long distances without contention. This means an increasing or decreasing total volume of traffic transferred is not the

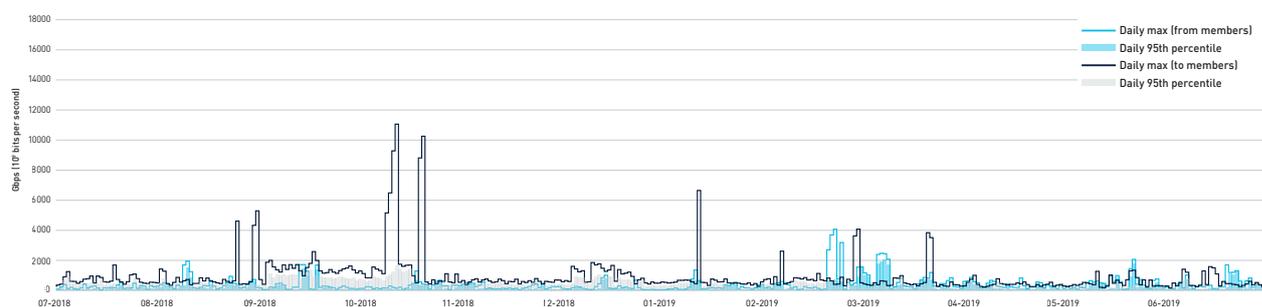
2 The SPE target of 2.17BP was based on 5% of estimated 2017/18 results, whereas the annual report target of 1.89BP is based on the actual 2017/18 results.

only representation of the value of the connection. The profile of the traffic being sent is important to fully understand the value and utilisation of this capability. This means the ability for traffic to be sent all at once is more valuable than the same amount of traffic sent over a longer timeframe.

We are seeing increasing capability of our end-users to source, produce and share their data-driven research with other members of global NRENs, which is a critical indicator of the value of our international NREN partnership and how it is used to facilitate inter-institutional collaboration.

It is difficult to set performance targets or trends for traffic profiles, so instead we show a trend graph of the traffic profile over time. The Graph below shows international research traffic over a two year period from April 2017. The 'spikes' show data-intensive research and science activity.

Daily international research and education traffic



Continued growth in international research and education traffic growth will be reliant on:

- > programmes with international member participants and/or the use of international research infrastructures.
- > The increasing capability of our member organisations, in technology and skills, to support the transfer of data inside their institutions.
- > Member investment confidence in data-intensive science and infrastructure on the basis that the long-term future of the REANNZ digital research infrastructure is assured.

Goal: Users consider the REANNZ network valuable or essential to their work

Measure	Result June 2018	Target June 2019	Result June 2019
Users consider the REANNZ network valuable or essential to their work	N/A	>80%	100%

The user survey for FY2018 was not undertaken because of the separate work with members to develop a revised business model.

The FY2019 survey, done via SurveyMonkey, was sent to 109 respondents covering 45 members. There were 39 individual respondents (37%) covering 20 (44%) of our member base, and 97.4% respondents (38 out of 39) answered this question.

Impact 2: Collaboration between science, innovative business and education sectors is enhanced

Collaboration takes many forms: it can be as simple as having a conversation over video conference, or as complex as the multi-step process of turning one scientist's research project into a commercial product. REANNZ enables these collaborations by providing the connectivity and the tools to make collaboration easier and more effective.

Increasing amounts of traffic flowing through our network is an indirect indicator of increased collaboration with both national and international participants, enabled by REANNZ.

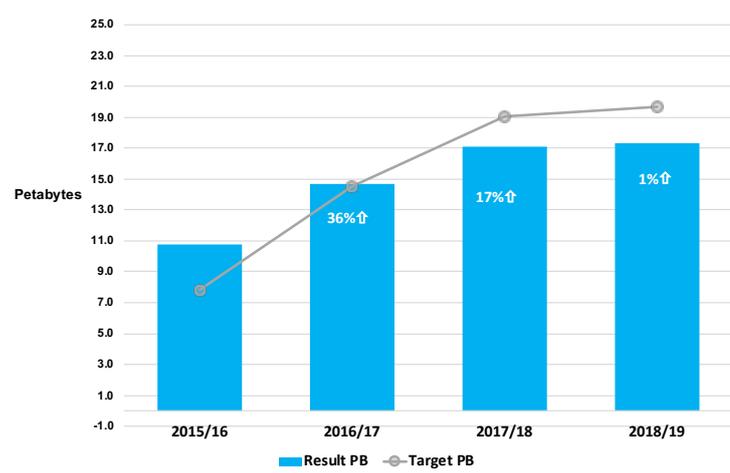
REANNZ has experienced exceptional growth over the past few years, in both international and national traffic volumes, as network upgrades have been implemented.

Measure	Result June 2018	Target June 2019	Result June 2019
International traffic volume			
Year-on-year growth	+17%	+15%	+1%
Total traffic volume	17.12 PB	19.69 PB ³	17.36 PB
National traffic volume			
Year-on-year growth	+30%	+10%	+51%
Total traffic volume	35.86 PB	39.45 PB⁴	54.20 PB

Measurements are in petabytes (PB)

Total traffic has increased seven-fold from 9.87PB in FY2014 to 71.56PB in FY 2019, and these high levels of increasing traffic flows is an indirect indicator that REANNZ is enabling increased collaboration with both national and international research and education participants.

International traffic growth



International traffic 2018/19 growth of 1% is lower than the target of 15%. This is due to the departure of some core members last year along with the installation of New Zealand content caches. The later has meant less traffic from major content providers on the international network thereby reducing the load on our international links. Most of these international caches are served domestically which also explains some of the increased traffic on the national network. Both of these negative impacts have been more than offset by other traffic demand on the international network from remaining members throughout 2018/19.

³ The Target PB is based on prior year actual results, since that number was not included in the SPE.

⁴ The Target PB is based on prior year actual results, since that number was not included in the SPE.

National traffic 2018/19 growth of 51% is as a result of the increased use of the national network by smaller members and the content caches noted above. We have also seen an increase in national traffic from data transfers to and from NIWA's supercomputer and the Measurement Lab nodes hosted by REANNZ for the Commerce Commission for SamKnows⁵ testing.

National traffic growth



Impact 3 : Users have access to the content and tools they need

REANNZ continues to develop services that meet the unique needs of our members, across research, academia, teaching and learning. We partner with our members to deliver services that add value, through leveraging the investment in network infrastructure, developing customised solutions where it is not available in the market, and creating a communal resource to increase production while lowering costs for our member community.

Examples of these services include eduroam (a global wi-fi roaming service between research and education organisations), Tuakiri (identity and access management) security services, technical advisory services, managed network services, high-quality internet, caching, cloud, and data centre connectivity.

An increase in members subscribing to REANNZ services indicates REANNZ's ability to deliver services that are relevant and provide value-for-money to our members.

Goal: Subscriptions to services increase

Measure	Result June 2018	Target June 2019	Result June 2019
Subscriptions to services increase	+16%	+10%	+8%

REANNZ has increased the number of service subscriptions by 44 over a 3-year period at an average yearly increase of 14% per annum.

Over recent years, REANNZ has worked to bring new value-added services to the community. During FY 2019 we have delivered a new 100Gbps service which has been taken up by one member and is under consideration by others.

⁵ Commerce Commission, 'Measuring New Zealand's broadband performance', <https://comcom.govt.nz/regulated-industries/telecommunications/monitoring-the-telecommunications-market/monitoring-new-zealands-broadband>.

Goal: eduroam usage increases

Users have access to content and tools they need	Result June 2018 ⁶	Target June 2019	Result June 2019
Total visitors – number of device connections in New Zealand made via eduroam	52,450	54,000	70,974
Total visitors – number of different institutions the visitors came from	2,122	2,300	2,371
Overseas visitors – number of device connections in New Zealand made via eduroam	33,766	34,800	39,460
Overseas visitors – number of different countries the visitors came from	65	65	74
New Zealand travellers – number of device connections made via eduroam by New Zealand users at other sites in New Zealand or overseas	52,991	50,500	79,920

Increasing eduroam usage, is a new measure introduced because of the importance our members place on this service which allows member participants to automatically join the wi-fi networks of any other participating institution, anywhere in the world. Eduroam has shown significant growth in FY 2019. Use of this service is another indicator of the quantity of services provided and their value to both our members and visitors to New Zealand from within the global research and education community.

Measuring our output

Output: Provide the REANNZ network, and, support the member community

Output performance measures tell us how well our work is delivering the desired results. We measure quality, quantity, timeliness and cost-effective performance measures.

Output measures: Quality

National network availability →99.90%

National and international network availability measures the reliability of the network. Network downtime includes faults and other connectivity or hardware outages, but excludes planned maintenance outages. The standard network availability for research and education networks internationally is 99.90%.

Network availability is crucial for our users to be able to perform their work when they need to. Network design is one way to maintain availability, even during outages, by the use of physically diverse paths, fail-over hardware and protected circuits. REANNZ's impressive network availability statistics (99.99% for the national network and 100% for the international network) are the result of our focus on operational excellence and designing for network resilience.

Packet delivery is a key element of network quality and one of the defining features of research and education networks. Research and education networks aim to eliminate 'packet loss' because it is catastrophic for large data transfers, which is typical of our user groups. Packet loss directly effects the quality of the user experience and the integrity of the information transferred.

⁶ A newly introduced measure, therefore amounts not audited in prior year.

Network availability	Result June 2018	Target June 2019	Result June 2019
National network availability	99.99%	99.90%	99.99%
International Network	100.00%	99.90%	99.95%*
Packet Delivery	99.999999%	99.999999%	99.999993%

* Since the cross over to the Hawaiki international submarine cable during 2019, the international network availability measure is an average of the network availability to Australia (FY2019 100.0%) and US (FY2019 99.89%)

Packet loss - poorly tuned networks that experience hardware or software faults or network congestion will drop packets – this is referred to as ‘packet loss’. Our community, who globally collaborate and participate in research, science, education and innovation, cannot accept packet loss. If they did, the time taken to transmit large datasets would extend from hours or days into weeks and months. In the worst case scenario, datasets couldn’t be sent and members simply couldn’t collaborate.

REANNZ focuses on **operating a ‘packet loss-less’ network**. We actively measure packets sent, and if packet loss is found, it is immediately minimised or eliminated. Some packet loss (errors) can occur while we’re fixing a network segment, but because of our **resilient design**, traffic will have been diverted to the other side and therefore **most packet loss does not impact our community** and the majority of the time, our network is without packet loss.

That is why our packet delivery targets are well beyond the levels of a regular telecommunications provider and it is the reason we have reported an average packet delivery of over 99.9999% across our network over the last 3 years. Telecommunications providers aim for 99.90%.

Output measures: Quantity

The number and size of our members’ network connections demonstrate the quantity of the services we provide. Adding new services is a measure of providing an increasing quantity of services to our members.

Capacity of connected sites increases - volume

	Result June 2018	Result June 2019
Network Scale and reach (volume of member connections)	+6% 1,137 Gbps	+23% 1,395 Gbps

Gbps = Gigabits per second

The volume of member connections is a calculation based on the number of member connections and their size. Volumes have grown over the last financial year as our members increased the size of their connections to meet increased demand, as we implemented second connections to our network for resilience, and as we added new members and connected new sites to the network.

Member connections have grown on average 40% each year from FY 2014.

Network capacity – speed

	Result June 2018 ⁷	Target June 2019	Result June 2019
Core national backbone capacity (speed)	20Gbps	100Gbps	100Gbps
Core international network capacity (speed)	34Gbps	54Gbps	60Gbps
Number of Points of Presence (national and international)	26	30	28

Gbps = Gigabits per second

The success of delivering large volumes of data is the result of the distance the data travels, *multiplied* by the speed the data travels *multiplied* by the packet delivery ratio.

REANNZ has no control over the distance the data is required to travel, but it can impact on speed through network capacity and packet delivery through a finely tuned and monitored network. The increasing capacity demonstrates the improved ability of the network to deliver large datasets.

The target of 30 PoP's was based on establishing a 2nd PoP in Sydney and a PoP in either Hawaii or a second site in the US. Both of these planned PoP's have been put on hold pending consultation with the community.

New Service Offerings

	Result June 2018	Target June 2019	Result June 2019
Service offerings added	1 Cloud Connect	1 New service offering available to members	1 100Gbps national connection

REANNZ planned to launch one new service offering during FY 2019. We succeeded in launching the 100Gbps national connection. This has already been taken up by one member and is actively being discussed with 3 other members.

Output Measures: Timeliness

More than 80% members consider any issues resolved in a timely manner

	Result June 2018	Target June 2019	Result June 2019
Users consider reported issues to be resolved in a timely manner (based on member survey)	N/A	80% ⁸	95%

⁷ A newly introduced measure, therefore amounts not audited in prior year.

⁸ Our target of 80% of responses resolved in a timely manner represents an appropriate balance between responsiveness and the cost of resourcing to increase responsiveness.

The speed at which we identify and resolve faults and other network performance issues is not only a measure of the quality of our customer service, but also a measure of the timeliness of our network management activity. We actively monitor the network to identify issues before they affect our members, and proactively advise of issues rather than simply being reactive to member calls. The REANNZ helpdesk also logs incident reports from users, and although we have internal resolution time targets, the true test of our timeliness is our members' opinion of our responsiveness to their challenges.

58% of the FY 2019 survey respondents, via SurveyMonkey, indicated that they had logged a support issue with REANNZ in the last year. Of these 95% (target 80%) indicated that the issue was understood and resolved in a timely manner.

Output measures: Cost-effectiveness

REANNZ is New Zealand's designated national research and education network. We're a highly specialised network service provider established to serve the complex and unique needs of New Zealand's research and science community, whose needs differ from other user groups. Our purpose is to design, deliver and operate New Zealand's backbone network to connect researchers and research institutes nationally and internationally so they can collaborate and contribute.

REANNZ's high-performance network is architected to support the unique needs of data-intensive research – it can manage time-sensitive and bursty traffic flows, delivers massive transfers at high speed, with low latency (minimal delays) and no packet loss (no data loss).

We are a highly specialised provider addressing a niche market that commercial networks cannot – the provisioning of the unique services that meet the needs of science, research and education. Direct comparisons of cost with commercial telecommunications providers are misleading.

Our network is designed to support time-sensitive and bursty traffic flows globally. The network also has other performance attributes such as very low packet loss thresholds and low latency and jitter, which commercial networks are not designed to support.

REANNZ maintains its core membership base

	Result June 2018	Target June 2019	Result June 2019
Service offerings increase	5/8 universities 7/7 CRIs 1/1 ATI 8/16 ITPs 1/3 wānanga	7/8 universities 7/7 CRIs 1/1 ATI 10/16 ITPs 1/3 wānanga	5/8 universities 7/7 CRIs 1/1 ATI 8/16 ITPs 1/3 wānanga
Core participating members	22	26	22
Other participating members	16	17	20
Total participating members	38	43	42

During the year, REANNZ reduced overall sector fees and renegotiated sector-based agreements with the university and CRI sectors respectively. Three universities who discontinued their services in 2018 have indicated their intention to renew their membership, which will occur in the 2019-2020 financial year.

REANNZ gained four new members: The College of Law, Lincoln Agritech, New Zealand Qualifications Authority and Whitecliffe College.

Increased membership shows REANNZ is cost effective for those members undertaking data intensive research and/or rely on an effective WAN to facilitate their decentralised approach to running their organisations.

Whilst the new sector pricing did encourage and enable individual members to positively evaluate the overall cost

effectiveness of the REANNZ services, the pricing changes have not addressed the future financial sustainability of REANNZ. REANNZ will be working with MBIE to identify options for a sustainable financial future, including opportunities to increase efficiency and scale, and improved funding mechanisms.

Output: The advanced research, education and innovation network and related tools

	Actual 2019 \$ 000	Budget 2019 \$ 000
Revenue		
Crown revenue	6,000	6,000
Network revenue	6,096	6,441
Other revenue	5,204	5,125
Total Revenue	17,300	17,566
Expenses		
Amortisation and depreciation	2,392	2,463
Network expenses	13,707	16,421
Operating expenses	3,855	4,826
Total Expenditure	19,954	23,710
Loss before gains	(2,653)	(6,144)
Plus: Gains	125	0
Surplus/(deficit)	(2,528)	(6,144)

FINANCIAL STATEMENTS /

Research and Education Advanced Network New Zealand Limited

Statement of Comprehensive Revenue and Expense for the year ended 30 June 2019

	Note	Actual 2019 \$ 000	Budget 2019 \$ 000	Actual 2018 \$ 000
Revenue				
Grant revenue				
Strategic Science Investment Fund	2	3,000	3,000	3,000
Hawaiki contribution	2	3,000	3,000	5,250
Network revenue		6,096	6,441	8,011
Other revenue	2	4,603	4,584	4,534
Interest revenue		601	541	752
Total Revenue		17,300	17,566	21,547
Network Expenses				
Depreciation and amortisation		2,199	2,239	2,000
Employment expenses		2,389	2,550	2,303
Network operating expenses	3	11,318	13,871	8,132
Total Network Expenses		15,906	18,660	12,435
Gross Surplus / (Loss)		1,394	(1,094)	9,112
Less:				
Operating Expenses				
Audit		33	35	33
Depreciation and amortisation		193	224	202
Directors' fees	4	161	129	126
Employment expenses		2,131	2,319	2,222
Other operating expenses		945	1,204	731
Professional services		150	518	207
Operating leases		247	258	213
Travel expenses		187	363	249
Total Operating Expenses		4,047	5,050	3,983
Surplus / (Deficit) excluding gains		(2,653)	(6,144)	5,129
Foreign currency gains / (losses)	5	125	-	1,522
Surplus / (Deficit)		(2,528)	(6,144)	6,651
Other comprehensive revenue		-	-	-
Total Comprehensive Revenue and Expense		(2,528)	(6,144)	6,651

Explanations of major variances to budget are provided in note 23.

The accompanying notes form part of these financial statements.

Research and Education Advanced Network New Zealand Limited

**Statement of Financial Position
as at 30 June 2019**

	Note	Actual 2019 \$ 000	Budget 2019 \$ 000	Actual 2018 \$ 000
CURRENT ASSETS				
Cash and cash equivalents	6	3,909	3,263	5,187
Funds held in escrow	6	-	-	4,029
Receivables and debtors	7	3,810	3,252	3,546
Investments	8	16,131	14,000	19,092
Derivative financial instruments	9	91	46	459
Prepayments		529	1,177	442
Prepaid network expenses	10	1,080	848	939
Total current assets		25,550	22,586	33,694
NON-CURRENT ASSETS				
Property, plant and equipment	11	11,103	12,525	13,081
Intangibles	12	3	3	7
Derivative financial instruments	9	48	-	79
Prepaid network expenses	10	18,084	17,464	14,742
Total non-current assets		29,238	29,992	27,909
TOTAL ASSETS		54,788	52,578	61,603
CURRENT LIABILITIES				
Accounts payable and accrued expenses	13	1,506	1,855	1,689
GST payable		210	254	(92)
Employee entitlements	14	155	183	249
Revenue in advance	15	1,117	2,782	2,248
Deferred revenue	15	-	-	3,165
Deferred lease incentive		17	17	17
Total current liabilities		3,005	5,091	7,276
NON-CURRENT LIABILITIES				
Deferred lease incentive		31	28	47
Total non-current liabilities		31	28	47
TOTAL LIABILITIES		3,036	5,119	7,323
NET ASSETS		51,752	47,459	54,280
EQUITY				
Share capital		16,001	16,001	16,001
Accumulated surplus		35,751	31,458	38,279
TOTAL EQUITY		51,752	47,459	54,280

Explanations of major variances to budget are provided in note 23.

The accompanying notes form part of these financial statements.

Research and Education Advanced Network New Zealand Limited

**Statement of Cash Flows
for the year ended 30 June 2019**

	Actual 2019 \$ 000	Budget 2019 \$ 000	Actual 2018 \$ 000
CASH FLOWS FROM OPERATING ACTIVITIES			
Cash was provided from / (applied to)			
Receipts from the Crown	3,000	3,000	3,000
Network revenue	4,685	6,420	7,816
Other revenue	4,503	4,534	4,684
Interest revenue	692	651	766
GST (net)	265	392	(110)
Payments to suppliers and employees	(14,473)	(18,058)	(13,258)
Prepayments for network connectivity	(6,864)	(6,061)	(6,699)
Realised gain on foreign currency	337	-	424
Net cash flow from operating activities	(7,855)	(9,122)	(3,377)
CASH FLOWS FROM INVESTING ACTIVITIES			
Cash was provided from / (applied to)			
Purchase of plant and equipment	(452)	(1,713)	(2,529)
Funds transferred from escrow	4,029	3,723	6,699
Term deposit investments	3,000	7,000	1,300
Net cash flow from investing activities	6,577	9,010	5,470
CASH FLOWS FROM FINANCING ACTIVITIES			
Cash was provided from / (applied to)			
Net cash flow from financing activities	-	-	-
Net (decrease) / increase in cash held	(1,278)	(112)	2,093
Cash at beginning of year	5,187	3,375	3,094
Cash at end of year	3,909	3,263	5,187
Represented by			
CASH AT BANK	3,909	3,263	5,187

Explanations of major variances against budget are provided in note 23.

The accompanying notes form part of these financial statements.

Research and Education Advanced Network New Zealand Limited

**Statement of Changes in Equity
for the year ended 30 June 2019**

	Note	Actual 2019 \$ 000	Budget 2019 \$ 000	Actual 2018 \$ 000
Balance at 1 July		54,280	53,603	47,629
Total comprehensive revenue and expense for the year		(2,528)	(6,144)	6,651
Equity at end of year	16	51,752	47,459	54,280

Signed on behalf of the Board:



Janine Smith, MNZM
Chair
17 October 2019



Dr. Judith Johnston
Audit & Risk Committee Chair
17 October 2019

Explanations of major variances to budget are provided in note 23.

The accompanying notes form part of these financial statements.

NOTES TO THE FINANCIAL STATEMENTS /

1. Statement of Accounting Policies	46
2. Revenue	47
i. Grant revenue	47
ii. Other revenue	48
3. Network operating expenses	48
4. Directors' fees	48
5. Foreign currency gains / (losses)	49
6. Cash and cash equivalents	49
7. Receivables and debtors	49
8. Investments	50
9. Derivative financial instruments	50
10. Prepaid network expenses	50
11. Property, plant and equipment	51
12. Intangible assets	53
13. Accounts payable and accrued expenses	54
14. Employee entitlements	54
15. Revenue in advance & deferred revenue	54
16. Equity	55
17. Capital commitments and operating leases	55
i. Capital commitments	55
ii. Operating lease commitments	55
iii. Connectivity and managed service commitments	56
iv. Finance leases	56
18. Contingencies	56
19. Related party transactions	56
20. Employee remuneration	57
21. Events after balance date	57
22. Financial instruments	57
23. Explanation of major variances to budget	58

1. Statement of accounting policies

REPORTING ENTITY

The reporting entity is Research and Education Advanced Network New Zealand Limited ('REANNZ'), a Crown entity as defined by the Crown Entities Act 2004 and a New Zealand incorporated company. As a Crown entity, REANNZ's ultimate parent is the New Zealand Crown.

REANNZ's primary objective is to establish, own and operate a high-speed communications network for the research and education sector. As such, REANNZ's aim is to provide services to the public, rather than make a financial return.

Accordingly, REANNZ has designated itself as a public benefit entity for the purposes of Public Benefit Entity (PBE) accounting standards with reduced disclosures.

The financial statements for REANNZ are for the year ended 30 June 2019 and were approved by the Board on 17 October 2019.

BASIS OF PREPARATION

The financial statements have been prepared on a going-concern basis, and the accounting policies have been applied consistently throughout the year.

Statement of compliance

The financial statements of REANNZ have been prepared in accordance with the Crown Entities Act 2004, which includes the requirement to comply with generally accepted accounting practice in New Zealand (NZ GAAP).

The financial statements comply with Public Benefit Entity accounting standards.

The financial statements have been prepared in accordance with Tier 2 PBE Accounting Standards with reduced disclosures. REANNZ is eligible to report as a Tier 2 reporting entity on the basis that it does not have public accountability and is not large.

Presentation currency and rounding

The financial statements are presented in New Zealand dollars (NZD) and all values are rounded to the nearest thousand (\$000).

Early adoption of standards

PBE IFRS 9 Financial Instruments sets out requirements for recognising and measuring financial assets, financial liabilities and some contracts to buy or sell non-financial items. The Treasury has elected

to early adopt PBE IFRS 9 in the Financial Statements for the Government for the 30 June 2019 financial year. REANNZ has also early adopted the standard for the 30 June 2019 financial standards to be consistent with Crown's accounting policies for financial instruments.

The adoption of this standard has had no material impact on the financial statements.

SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Accounting policies are selected and applied in a manner that ensures that the resulting financial information satisfies the concepts of relevance and reliability. REANNZ accounting policies, therefore, are designed to report the substance of the underlying transactions undertaken by the entity.

Significant accounting policies are included in the notes to which they relate.

Significant accounting policies that do not relate to a specific note are outlined below:

Foreign currency transactions

Transactions in foreign currencies, including those for which forward foreign exchange contracts are held, are translated to New Zealand dollars (the functional currency) at the spot rate on the date of transaction.

Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognised in the Statement of Comprehensive Revenue and Expense.

Statement of Cash Flows

The Statement of Cash Flows is prepared exclusive of GST, which is consistent with the method used in the Statement of Comprehensive Revenue and Expense.

Definitions of the terms used in the Statement of Cash Flows are:

"Cash" includes coins and notes, demand deposits and other highly liquid investments readily convertible into cash used by REANNZ as part of its day-to-day cash management.

"Investing activities" are those activities relating to the acquisition and disposal of long-term assets and other investments not included in cash equivalents.

"Financing activities" are those activities relating to changes in equity of REANNZ.

“Operating activities” include all transactions and other events that are not investing or financing activities.

Goods and Services Tax (GST)

These financial statements have been prepared on a GST exclusive basis except for accounts receivable and accounts payable that are stated inclusive of GST.

The net GST paid to, or received from, Inland Revenue, including the GST relating to investing and financing activities, is classified as an operating cash flow in the Statement of Cash Flows.

Commitments and contingencies are disclosed exclusive of GST.

Income tax

As a public entity under section CW 38(2) of the Income Tax Act 2007, the company is exempt from income tax. Accordingly, no provision has been made for income tax.

Budget figures

The budget figures are those that form part of the REANNZ 2018/19 Statement of Performance Expectations dated 1 July 2018 and approved by the Board.

The budget figures have been prepared in accordance with generally accepted accounting practice and are consistent with the accounting policies adopted by REANNZ for the preparation of the financial statements.

Critical accounting estimates and assumptions

In preparing these financial statements, REANNZ has made estimates and assumptions concerning the future. These estimates and assumptions may differ from subsequent actual results. Estimates and assumptions are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

The estimates and assumptions that have significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are:

- Useful lives and residual values of property, plant and equipment – refer to note 11.

2. Revenue

Accounting Policy

The specific accounting policies for significant revenue items are explained below:

Grant revenue

REANNZ is funded in part by the Crown from the Strategic Science Investment Fund (SSIF). The SSIF grant is provided to partially fund the delivery of specialist services and activities to meet the Government’s goals for research and education. REANNZ must undertake an agreed work plan (Platform Plan) and the grant is recognised as revenue when paid because there are no other conditions attached.

Other grants are recognised as revenue when they become receivable unless there is an obligation in substance to return the funds if conditions of the grant are not met. If there is such an obligation, the grants are initially recorded as deferred income in the Statement of Financial Position and recognised as revenue when conditions of the grant are satisfied.

Network and other revenue

Revenue is measured at the fair value of the consideration received or receivable. All transactions are exchange transactions.

Interest revenue

Interest revenue is recognised by accruing the interest due for the investment on a time proportion basis.

i. Grant revenue

	2019 \$ 000	2018 \$ 000
Non-exchange transactions		
Ministry of Business, Innovation & Employment Strategic Science Investment Fund contract	3,000	3,000
Ministry of Business, Innovation & Employment Crown funding agreement - Hawaiki Cable Managed Capacity	3,000	5,250
Total grant revenue	6,000	8,250

REANNZ and the Ministry of Business, Innovation and Employment (‘MBIE’) entered into a SSIF Infrastructure Platform Investment contract during the 2018 financial year. The contract is for seven years, expiring on 30 June 2024, and provides REANNZ with an annual grant of \$3M (total grant \$21M).

In June 2014, REANNZ received a \$15M grant from MBIE expressly for the initial fee of a 25-year lease of managed capacity with Hawaiki Submarine Cable

Limited Partnership ('Hawaiki'). The grant was held in escrow and paid to Hawaiki upon the achievement of agreed milestones. Grant revenue of \$3M was recognised this financial year, in line with the final milestone payment to Hawaiki. The cable was Ready for Service ('RFS') on 20 July 2018 and the final milestone payment was made on 16 August 2018.

All conditions relating to the Crown funding agreement have been met.

ii. Other revenue

	2019 \$ 000	2018 \$ 000
Exchange transactions		
Managed services	2,403	2,471
Internet	1,224	1,585
Other	763	478
APAN 46 meeting fees & sponsorship	213	-
Total other revenue	4,603	4,534

3. Network operating expenses

	2019 \$ 000	2018 \$ 000
National network		
Fibre circuits & maintenance	1,958	2,034
Other network expenses	751	1,077
PoP accommodation	375	349
Connectivity	21	21
Asset disposals	-	-
Total national network expenses	3,105	3,481
International network		
International connectivity	7,661	4,544
Fibre circuits	247	2
Other network expenses	187	72
PoP accommodation	118	33
Total international network expenses	8,213	4,651
Total network operating expenses	11,318	8,132

International connectivity costs were significantly higher than the previous financial year because of the \$4.24M paid to the prior provider during the crossover period of the two supply contracts.

Network expenses include \$378K relating to operating lease expenses recognised during the year (2018: \$325K).

4. Directors' fees

	2019 \$ 000	2018 \$ 000
The total value of remuneration paid or payable to each Board member during the year was:		
J Smith (Chair)^	28	-
R Peat (Deputy Chair)	31	25
S Brownlie*	19	-
J Johnston*	16	-
D Skinner*	46	-
S Weaver	21	20
J Donovan**	-	41
S Hall**	-	20
S Johnstone**	-	20
Total directors' fees	161	126

^ appointed 12 November 2018

* appointed 1 October 2018

**appointed to 30 June 2018

2019 directors' fees include special fees of \$37K (2018: \$Nil) approved by the Minister of Research, Science and Innovation.

There have been no payments made to committee members appointed to the Board who are not directors during the year.

REANNZ provides a deed of indemnity to directors for certain activities undertaken in performance of REANNZ's functions.

REANNZ holds Directors and Officers Liability and Professional Indemnity insurance cover in respect of the liability of Board members and employees.

No Board members received compensation or other benefits in relation to cessation (2018: \$Nil)

5. Foreign currency gains/ (losses)

	2019 \$ 000	2018 \$ 000
Realised foreign currency gains / (losses)	463	424
Unrealised foreign currency gains / (losses)		
Escrow account (USD)	-	646
Fair value losses on derivatives*	(398)	267
Bank account (USD)	60	185
Total foreign currency gains / (losses)	125	1,522

*includes reversal of unrealised gains on settlement of trades

Realised gains arose from the settlement of forward contracts to purchase USD and the closure of the USD denominated escrow account, established for the sole purpose of making Hawaiki initial fee milestone payments.

Unrealised gains were made on forward USD contracts held with the New Zealand Debt Management Office (NZDMO) and ASB reflecting the net movement in fair value of open contracts for the year. The unrealised losses reflect the reversal of unrealised gains on settlement of the trades offset by unrealised gains on the open trades.

As at 30 June 2019, REANNZ held seven forward contracts (2018: six contracts) to purchase a total of US\$4.28M (2018: US\$4.10M). Four contracts will settle during FY2020. The contracts were entered into to mitigate foreign exchange exposure arising from annual network payments contractually required to be paid in USD.

6. Cash and cash equivalents

	2019 \$ 000	2018 \$ 000
Cash at bank and on hand	3,909	5,187
Total cash and cash equivalents	3,909	5,187

The total above includes NZ\$6K Held in USD (2018: \$3.45M).

In July 2014, REANNZ entered into a 25-year lease of managed capacity with the Hawaiki Submarine Cable Limited Partnership. At this time, the initial fee of \$15M (US\$13.21M) was deposited into a USD denominated escrow account, as required by the contract where all obligations were payable in USD. The balance of the account as at 30 June 2018 was NZ\$4.03M. The final milestone of US\$2.6M was paid in August 2018 and the account was closed.

7. Receivables and debtors

Accounting Policy

Accounts receivable are recorded at the amount due less an allowance for credit losses. REANNZ applies the simplified credit loss model of recognising lifetime expected credit losses for receivables.

In measuring expected credit losses, receivables have been assessed on an entity-type basis as this determines shared credit risk characteristics.

Receivables are expensed in the Statement of Comprehensive Revenue and Expense when there is no reasonable expectation of recovery. Indicators that there is no reasonable expectation of recovery include the debtor being in liquidation.

Previous accounting policy for impairment of receivables

In the previous year, the provision for credit losses was based on the incurred credit loss model. An allowance for credit losses was recognised only when there was objective evidence that the amount due would not be fully collected.

Breakdown of receivables and debtors	2019 \$ 000	2018 \$ 000
Exchange transactions		
Trade receivables	2,923	2,643
Less: provision for uncollectibility	(40)	(19)
Total receivables	2,883	2,624
Forward USD contract receivable	926	907
Sundry debtors	1	15
Total receivables and debtors	3,810	3,546

Membership fees are due quarterly in advance and service fees are due monthly in advance. Of the total receivables and debtors above, \$1.26M including GST (2018: \$2.07M including GST) relate to membership fees and services to be provided by REANNZ during the coming financial year. These fees are shown as revenue

in advance until the service period begins, when the fees are recognised as revenue in the Statement of Comprehensive Revenue and Expense.

REANNZ holds no collateral as security or other credit enhancements over receivables that are past due or impaired.

8. Investments

Accounting Policy

Bank term deposits

Investments in bank term deposits are initially measured at the amount invested.

Interest is subsequently accrued and added to the investment balance. A loss allowance for expected credit losses is recognised if the estimated loss allowance is not trivial.

Breakdown of investments	2019 \$ 000	2018 \$ 000
Term deposits (maturity one year or less)	16,131	19,092
Total investments	16,131	19,092

There is no impairment provision for investments as there is no expectation of credit losses. All term deposits are held with major trading banks with Standard & Poor's AA- rating.

9. Derivative financial instruments

Accounting Policy

REANNZ enters into derivative financial instruments, including forward foreign exchange contracts, as part of its normal operations to manage its exposure to foreign exchange rate risk. REANNZ does not hold or issue derivatives for trading purposes. REANNZ has not adopted hedge accounting.

Derivatives are initially recognised at the fair value on the date a derivative contract is entered into and are subsequently re-measured to their fair value at each balance date with the resulting gain or loss recognised in the Statement of Comprehensive Revenue and Expense.

A forward foreign exchange derivative is classified as current if the contract is due for settlement within 12 months of balance date. Otherwise, the full fair value of forward foreign exchange derivatives is classified as non-current.

Derivative financial instruments are recognised at fair value in the Statement of Financial Position.

On 30 June 2019, the fair value of derivative financial instrument assets was \$139K (2018: \$538K). Of this amount, \$91K relates to USD forward contracts due to be settled within 12 months, with the remaining amount to be settled in FY2021.

The fair value of forward foreign exchange contracts has been determined using a discounted cash flows valuation technique based on quoted market prices. The inputs into the valuation model are from independently sourced market parameters such as currency rates. Most market parameters are implied from forward foreign exchange contract prices.

10. Prepaid network expenses

Prepaid network expenses relate to core connectivity and network service operations and management. These prepayments will be expensed to the Statement of Comprehensive Revenue and Expense on a straight-line basis over the contract term.

	2019 \$ 000	2018 \$ 000
Balance at beginning of year	15,681	9,370
Prepayment expensed during year	(3,381)	(388)
Payments made during the year	6,864	6,699
Net book value	19,164	15,681
Current/non-current split		
Current	1,080	939
Non-current	18,084	14,742
Total prepaid network expenses	19,164	15,681

REANNZ and the Hawaiki Submarine Cable Limited Partnership entered into a 25-year lease contract for managed international capacity in July 2014. The contract required four milestone payments in USD. The final payment of US\$2.62M for 20% of the initial fee (total US\$13.21M plus taxes) was made in August 2018.

The milestone payments were converted into NZD at the spot rate on payment date. The total amount of the four milestone payments (including taxes) was NZ\$19.31M. Annual amortisation of the initial fee of \$774K is on a straight-line basis over the 25-year life of the contract from August 2018.

An upfront build fee of \$100K for network connectivity was paid in September 2018. This amount is being amortised over the two-year contract period.

11. Property, plant and equipment

Accounting Policy

Property, plant and equipment consists of six classes, which are measured as follows:

- › Leasehold improvements, at cost less accumulated depreciation and impairment losses.
- › Routers, switches and optical equipment, at cost less accumulated depreciation and impairment losses.
- › Information technology equipment, at cost less accumulated depreciation and impairment losses.
- › Office equipment, at cost less accumulated depreciation and impairment losses.
- › PoP ('Point of Presence') equipment, at cost less accumulated depreciation and impairment losses.
- › Fibre and fibre housing, at cost less accumulated depreciation and impairment losses.

Additions

The cost of an item of property, plant and equipment is only recognised as an asset when it is probable that future economic benefits or service potential associated with the item will flow to REANNZ and the cost of the item can be measured reliably.

Work in progress is recognised at cost less impairment and is not depreciated.

In most instances, an item of property, plant and equipment is initially recognised at cost. Where an asset is acquired through a non-exchange transaction, the asset will be recorded at fair value at the date of acquisition.

Costs incurred subsequent to initial acquisition are capitalised only when it is probable that future economic benefits or service potential associated with the item will flow to REANNZ and the cost of the item can be measured reliably.

The costs of servicing property, plant and equipment are recognised in the Statement of Comprehensive Revenue and Expense as they are incurred.

Disposals

Gains and losses on disposals are determined by comparing the proceeds of disposal with the carrying amount of the asset. Gains and losses on disposal are included in the Statement of Comprehensive Revenue and Expense.

Depreciation

Depreciation on property, plant and equipment (excluding work in progress) is calculated on a straight-line basis, from the time the asset is in the location and condition necessary for its intended use. This basis allocates the cost or value of the asset, less its residual value, over its estimated useful life.

The depreciation method, estimated useful lives and residual values of property, plant and equipment are reviewed annually to assess appropriateness.

The following estimated useful lives are used in the calculation of depreciation:

Leasehold improvements	6 years
Routers, switches & optical equipment	3-8 years
Information technology equipment	3 years
Office equipment	5 years
PoP equipment	8 years
Fibre and fibre housing	20 years

Leasehold improvements are depreciated based on estimated useful life or the remaining lease term, whichever is shorter.

Impairment of property, plant and equipment and intangible assets

REANNZ does not hold any cash-generating assets. Assets are considered cash-generating where their primary objective is to generate a commercial return.

Non-cash generating assets

At each reporting date, assets are reviewed by the directors to determine whether there are any events or changes in circumstances that indicate that carrying amounts may not be recoverable. An impairment loss is recognised as the amount by which the asset's carrying amount exceeds its estimated recoverable amount.

If the carrying amount of an asset exceeds its recoverable amount, the asset is impaired and the carrying amount is written down to the recoverable amount. The impairment loss is then recognised as an expense in the Statement of Comprehensive Revenue and Expense.

Where an item of property, plant or equipment has been revalued, any impairment loss is recognised against the revaluation reserve for that class of asset. Where this results in a debit balance in the revaluation reserve, the balance is recognised in the Statement of Comprehensive Revenue and Expense.

Any reversal of an impairment loss is recognised in the Statement of Comprehensive Revenue and Expense.

Impairment losses can only be reversed to the extent that the carrying amount of the asset matches the carrying amount as calculated under the cost less accumulated depreciation method.

For items of property, plant or equipment that have been re-valued, any reversal of impairment loss is credited back to the revaluation reserve. However, to the extent that an impairment loss for that class of asset was previously recognised in the Statement of Comprehensive Revenue and Expense, a reversal of impairment loss is also recognised in the Statement of Comprehensive Revenue and Expense.

Critical accounting estimates and assumptions

Estimating useful lives and residual values of property, plant and equipment:

At each balance date, the useful lives and residual values of property, plant and equipment are reviewed. Assessing the appropriateness of useful life and residual value estimates of property, plant and equipment requires a number of factors to be considered such as the physical condition of the asset, expected period of use of the asset by REANNZ, and expected disposal proceeds from the future sale of the asset.

An incorrect estimate of the useful life or residual value will affect the depreciation expense recognised in the Statement of Comprehensive Income and Expense, and carrying amount of the asset in the Statement of Financial Position. REANNZ minimises the risk of this estimation uncertainty by:

- › Physical inspection of assets,
- › Asset replacement programmes, and
- › Review of second-hand market for similar assets.

REANNZ has not made significant changes to past assumptions concerning useful lives and residual values.

Breakdown of property, plant and equipment

Movements for each class of property, plant and equipment are as follows:

	Office equipment \$'000	ICT equipment \$'000	National PoP equipment \$'000	International PoP equipment \$'000	Leasehold improvements \$'000	Network services \$'000	Fibre and fibre housing \$'000	Total \$'000
Cost or valuation								
Balance at 1 July 2017	108	645	11,004	103	381	46	8,202	20,489
Balance at 30 June 2018	132	721	11,056	1,028	381	37	8,210	21,565
Additions	-	12	400	-	-	-	-	412
Sales/write-offs	-	(41)	(265)	(4)	-	(12)	-	(322)
Balance at 30 June 2019	132	692	11,191	1,024	381	25	8,210	21,655
Accumulated depreciation								
Balance at 1 July 2017	74	415	5,251	103	75	39	1,589	7,546
Balance at 30 June 2018	87	511	5,563	151	138	35	1,999	8,484
Depreciation expense	13	117	1,617	167	63	1	410	2,388
Disposals	-	(40)	(265)	(4)	-	(11)	-	(320)
Balance at 30 June 2019	100	588	6,915	314	201	25	2,409	10,552
Carrying amounts								
Balance at 1 July 2017	34	230	5,753	-	306	7	6,613	12,943
Balance at 30 June 2018	45	210	5,493	877	243	2	6,211	13,081
Balance at 30 June 2019	32	104	4,276	710	180	-	5,801	11,103

The net carrying amount of fibre held under finance leases is \$1.58M (2018: \$1.69M). Also refer to note 17.

12. Intangible assets

Accounting Policy

Software is a finite life intangible and is recorded at cost less accumulated amortisation and impairment. Amortisation is charged on a straight-line basis over the estimated useful life of the intangible asset.

Costs associated with maintaining computer software are recognised as an expense when incurred.

Staff training costs are recognised as an expense when incurred.

Costs associated with the development and maintenance of the REANNZ website are recognised as an expense when incurred.

The useful life and associated amortisation rates of major classes of intangible assets have been estimated as follows:

Illustration and software licences	3 years	33.3%
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Impairment of intangible assets

Refer to the policy for impairment of property, plant and equipment in note 11. The same approach applies to the impairment of intangible assets.

Breakdown of intangible assets	Illustration licence \$000	Software \$000	Total \$000
Gross carrying amount			
Balance at 1 July 2017	9	49	58
Balance at 30 June 2018	9	51	60
Additions	-	-	-
Disposals	-	(49)	(49)
Balance at 30 June 2019	9	2	11
Accumulated amortisation			
Balance at 1 July 2017	-	49	49
Balance at 30 June 2018	3	50	53
Amortisation expense	3	1	4
Disposals	-	(49)	(49)
Impairment losses	-	-	-
Balance at 30 June 2019	6	2	8
Carrying amounts			
At 1 July 2017	9	-	9
At 30 June 2018	6	1	7
At 30 June 2019	3	-	3

There are no restrictions over the title of intangible assets, nor are any intangible assets pledged as security for liabilities.

13. Accounts payable and accrued expenses

Accounting Policy

Short-term payables are recorded at the amount payable.

Breakdown of payables and accrued expenses	2019 \$ 000	2018 \$ 000
Exchange transactions		
Creditors	1,409	1,462
Accrued expenses	97	227
Total accounts payable and accrued expenses	1,506	1,689

14. Employee entitlements

Accounting Policy

Employee benefits due to be settled within 12 months after the end of the year in which the employee provides the related service are measured based on the accrued entitlements at current rates of pay. These include salaries and wages accrued up to balance date, annual leave earned but not yet taken at balance date.

A liability and an expense are recognised for bonuses where there is a contractual obligation or where there is a past practice that has created a constructive obligation and a reliable estimate of the obligation can be made.

Breakdown of employee entitlements	2019 \$ 000	2018 \$ 000
Accrued salaries and wages	24	32
Annual leave	131	217
Total employee entitlements	155	249

It is expected that all employee entitlements will be settled within 12 months of balance date.

15. Revenue in advance

	2019 \$ 000	2018 \$ 000
Exchange transactions		
Fees received in advance	18	452
Fees invoiced but not yet received	1,099	1,796
Total revenue in advance	1,117	2,248

Revenue in advance includes membership fees billed in advance and fees for services billed in advance. All services billed in advance will be provided by REANNZ in the coming financial year. These fees are shown as revenue received in advance until the service period begins, at which time the fees will be recognised as revenue in the Statement of Comprehensive Revenue and Expense.

There was no deferred revenue at balance date (2018: \$3.17M). The final \$3M MBIE Crown funding for the initial fee of the Hawaiki Cable Managed Capacity received in July 2014 was recognised in August 2018 when the cable was Ready for Service. The remaining deferred revenue amount was recognised during the year in line with services provided.

16. Equity

Capital management

REANNZ's capital is its equity, which comprises accumulated funds and contributed capital. Equity is measured as the difference between total assets and total liabilities.

REANNZ is subject to the financial management and accountability provisions of the Crown Entities Act 2004, which impose restrictions in relation to borrowings, acquisition of securities, issuing guarantees and indemnities and the use of derivatives.

REANNZ manages its equity as a by-product of prudently managing revenues, expenses, assets, liabilities, investments, and general financial dealings to ensure REANNZ effectively achieves its objectives and purpose, whilst remaining a going concern.

Contributed capital

At 30 June 2019, share capital comprised 1,816 ordinary shares (2018: 1,816). All issued shares are fully paid and have no par value.

Breakdown of equity	2019	2018
	\$ 000	\$ 000
Contributed capital		
Balance at 1 July	16,001	16,001
Capital contribution	-	-
Repayment of capital	-	-
Balance at 30 June	16,001	16,001
Accumulated surplus/(deficit)		
Balance at 1 July	38,279	31,628
Surplus / (deficit) for the year	(2,528)	6,651
Balance at 30 June	35,751	38,279
Total equity	51,752	54,280

17. Capital commitments and operating leases

i. Capital commitments

There were no capital commitments at balance date.

ii. Operating lease commitments

Accounting Policy

An operating lease is a lease that does not transfer substantially all the risks and rewards incidental to ownership of an asset to the lessee. Lease payments under an operating lease are recognised as an expense on a straight-line basis over the lease term.

Lease incentives received are recognised in the Statement of Comprehensive Income and Expense as a reduction of rental expense over the lease term.

Where the leased items are not in use, the operating lease payments will be treated as a prepayment in the Statement of Financial Position. Once the items begin to be used in deriving revenue, these prepayments are released to the Statement of Comprehensive Revenue and Expense on a straight-line basis over the period of the remaining operating lease term.

Operating leases relate to the following activities:

- Office premises at 22 The Terrace, Wellington and 24 Balfour Road, Parnell, Auckland; and
- Network PoP accommodation and associated support facilities

The future aggregate minimum lease payments payable under non-cancellable operating leases are as follows:

	2019	2018
	\$ 000	\$ 000
Less than one year	459	581
Between one and two years	324	407
Between two and five years	270	550
Later than five years	-	-
Total operating lease commitments	1,053	1,538

There are no restrictions placed on REANNZ by any of its leasing arrangements.

iii. Connectivity and managed service commitments

Connectivity and managed service commitments relate to:

- › Payments to suppliers for national and international connectivity services, and
- › Payments to suppliers for service management of the national network.

	2019 \$ 000	2018 \$ 000
Less than one year	3,915	7,904
Between one and two years	2,559	3,226
Between two and five years	7,117	7,216
Later than five years	44,973	46,983
Total connectivity and managed service commitments	58,564	65,329

In June 2014, REANNZ entered into a 25-year lease of managed capacity with Hawaiki Submarine Cable Limited Partnership. The first condition of the lease was met on 31 March 2016, at which point the contract became non-cancellable.

The upfront cost ('initial fee') of the lease was \$19.31M paid in USD instalments as key milestones were met. The final payment was made in August 2018 at which point recognition of the initial fee over the 25-year term of the contract commenced.

REANNZ will incur additional annual connectivity charges over the 25-year lease term. These costs are reflected above and form the whole amount of the later than five years total.

iv. Finance leases

Accounting Policy

A finance lease is a lease that transfers to the lessee substantially all the risks and rewards incidental to ownership of an asset, whether or not title is eventually transferred.

At the commencement of the lease term, prepaid finance leases where REANNZ is the lessee are recognised as an asset in the Statement of Financial Position at the fair value of the leased item.

The amount recognised as an asset is depreciated over its useful life. If there is no reasonable certainty as to whether REANNZ will obtain ownership at the end of the lease term, the asset is fully depreciated over the shorter of the lease term and its useful life.

Indefeasible Rights of Use (IRUs) have been granted to REANNZ over specific fibre pairs and have been accounted for as finance leases as the risks and rewards of ownership have transferred to REANNZ. The net carrying amount of the leased assets is \$1.58M (2018: \$1.69M).

The finance lease term is for the expected economic life of the asset and has been prepaid. As such, there are no future finance lease payments payable.

REANNZ does not hold an option to purchase the asset at the end of the lease term.

18. Contingencies

There were no contingent assets or liabilities at balance date for which disclosure is required (2018: \$Nil).

19. Related party transactions

REANNZ is a wholly owned entity of the Crown.

Related party disclosures have not been made for transactions with related parties that are within a normal supplier or client/recipient relationship with terms and conditions no more or less favourable than those that it is reasonable to expect REANNZ would have adopted in dealing with the party at arm's length in the same circumstances.

Further, transactions with other government agencies (for example, government departments and Crown entities) are not disclosed as related party transactions when they are on normal terms and conditions consistent with the normal operating arrangements between government agencies.

Gravelroad Limited, a consultancy company that REANNZ director David Skinner is also a director of, was paid \$94K for the Acting Chief Executive services he provided. David was in the role for three months during the search for a permanent Chief Executive. The REANNZ Board of directors made the appointment because of his specialist network knowledge. The appointment was consistent with the terms approved by the Minister of Research, Science and Innovation.

Key management personnel compensation

The compensation of the Board of directors and the Chief Executive and senior management (the Senior Leadership Team), being the key management personnel of REANNZ, is set out overleaf:

	2019 \$ 000	2018 \$ 000
Directors		
Remuneration	161	126
Full-time equivalent members	0.90	1.46
Senior Leadership Team		
Remuneration	1,305	1,121
Full-time equivalent members	5.19	4.89
Total key management personnel remuneration	1,466	1,247
Total full-time equivalent personnel	6.09	6.35

The full-time equivalent for Board members has been determined based on the frequency and length of Board and committee meetings, estimated time for Board members to prepare for meetings, attendance at external stakeholder meetings and advice provided to the Senior Leadership team.

The Board had two directors for the full year, three were appointed on 1 October 2018 and the Chair was appointed on 12 November 2018.

An analysis of Board member remuneration is provided in note 4.

20. Employee remuneration

Remuneration and other benefits of \$100,000 per annum or more paid or payable to employees in their capacity as employees were:

	2019 Employees	2018 Employees
\$100,000 - \$109,999	3	3
\$110,000 - \$119,999	3	2
\$120,000 - \$129,999	5	-
\$130,000 - \$139,999	2	3
\$140,000 - \$149,999	1	1
\$150,000 - \$159,999	1	-
\$160,000 - \$169,999	2	3
\$170,000 - \$179,999	-	1
\$180,000 - \$189,999	1	2
\$190,000 - \$199,999	2	-
\$200,000 - \$209,999	1	-
\$220,000 - \$229,999	2	-
\$230,000 - \$239,999	-	1
\$330,000 - \$339,999	-	1

During the year ended 30 June 2019, REANNZ paid \$46K compensation and other benefits in relation to cessation to one employee (2018: \$44K to three employees).

21. Events after balance date

There were no significant events after balance date.

22. Financial instruments

Financial instrument categories

The carrying amount of financial asset and liability categories are as follows:

	2019 \$ 000	2018 \$ 000
Mandatorily measured at fair value through surplus or deficit – (2018: Held for trading)		
Derivative financial instrument assets	139	538
Financial liabilities measured at amortised cost		
Accounts payable and accrued expenses (excluding income in advance, taxes payable and grants received subject to conditions)	1,506	1,689
Finance leases	1,580	1,691
Total financial liabilities measured at amortised cost	3,086	3,380
Financial assets measured at amortised cost (2018: Loans and receivables)		
Cash and cash equivalents	3,909	5,187
Funds held in escrow	-	4,029
Debtors and other receivables	3,810	3,546
Investments – term deposits	16,131	19,092
Total financial assets measured at amortised cost	23,850	31,854

23. Explanation of major variances to budget

Statement of Comprehensive Revenue and Expense

Revenue

Total revenue was \$266K under budget for the year. Reduced membership fees from the university and Crown Research Institute sectors from January 2019 were partly offset by conference fee and sponsorship revenue of \$213K from the APAN meeting hosted by REANNZ in August 2018. Interest revenue exceeded budget because cash reserves were generally higher than budgeted throughout the year. Higher levels of cash reserves were achieved through deferring capital expenditure, delaying operational expenses, and prudent procurement - so long as there was no adverse impact to the business or network performance. Management will continue to actively minimise use of cash reserves until long term financial sustainability is more certain.

Network expenses

Overall, network expenses were \$2.76M lower than budget. Savings were obtained from;

- › The delay to the acceptance of Hawaiki international cable to August 2018, reduced the costs of the initial fee amortisation and the crossover of the Hawaiki capacity (with the previous international capacity supplier).
- › Deferred or permanent capital expenditure savings in national network capacity upgrades reduced the cost of depreciation compared to budget. Investment in international network equipment are deferred while options for a permanent international internet solution are collaborated and agreed with our membership. Meanwhile, the cost of the interim international resiliency solution was less than budget because of the timing.
- › A High Court appeal in relation to REANNZ's eligibility to pay the Telecommunications Development Levy was successful. Net savings of \$220K resulted, consisting of a refund of \$110K for the FY2017 levy plus the budgeted FY2018 levy not required to be paid during FY2019.
- › Lower than budget third party managed service and PoP hosting costs, from lower levels of new services that drive those incremental network costs.

Other costs

Overall operating expenses were under budget for the year from cost efficient procurement. Use of external consultants was minimised due to deferment or using internal resource. Legal fees associated with international supplier contracts and new member contracts were not to the level expected.

Personnel costs were under budget from roles vacated during the year that were not re-appointed and timing of recruitment. Staff training, and benefits were not to the level expected. These savings were partly offset with the cost of recruitment itself and the higher costs of backfilling vacant roles with temporary staff.

Travel costs were minimised through the full year impact of the Auckland office which reduced the need for domestic travel and lower levels of international travel from lower attendance at community meetings and conferences overseas.

Foreign currency gains/(losses)

Unrealised exchange losses of \$338K consist of foreign exchange gains on USD denominated bank accounts offset by the reversal of unrealised fair value gains on derivative financial instruments on settlement. Most of the realised gains of \$463K materialised on settlement of forward foreign currency trades and closure of the USD denominated escrow account.

Statement of Financial Position

Differences between actual expenditure and budget assumptions for the new international cable impacted cash, investments, prepaid network expenses and property, plant and equipment.

Capital expenditure in international network hardware did not occur as a permanent international resiliency solution has not been able to be finalised with our membership through the proposed new community collaboration framework. National network capital expenditure was under budget because demand in capacity was managed with existing equipment. The cumulative effect of the savings contributed to cash reserves being higher than expected at balance date.

Accounts receivable were higher than budget as the university sector were billed in arrears for quarterly membership fees while a new contract was being finalised.

Statement of Cash Flows

Operating cash flows

Reduced membership fees and the delayed billing of university membership fees while contracts were under negotiation caused the variance in network revenue of \$1.74M.

Operational savings from the network and operating expenditure resulted in cash payment savings of \$3.59M to suppliers and employees.

Actual prepaid network expenses were \$803K higher than budgeted because of a downward movement in the NZD against the USD and US taxes that were not budgeted.

Investing cash flows

Minimal investment was required in national network capital expenditure as existing equipment was able to manage capacity increases. There was no investment in international network equipment while a permanent international internet solution was still being agreed with members. The lower levels of cash required for capital investment meant less need to draw down investment funds held on interest bearing term deposit investments.

REANNZ members as at 1 July 2019

Members

Universities



Crown Research Institutes



Institutes of Technology and Polytechnics



Wānanga



Education



Research



REANNZ