



REANNZ ANNUAL REPORT

Year ended 30 June 2018

REANNZ

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

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OUR VISION /

For New Zealand to be at the forefront of digitally-advanced research, education and innovation.

OUR MISSION /

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

OUR ACHIEVEMENTS 2017–2018 /

During 2017–2018, we:

- › Saw a 61% year-on-year increase in international research data traffic.
- › Achieved zero packet loss across our network, ie, $\leftarrow 0.0000001\%$ loss over 58 trillion packets.
- › Accepted the new Hawaiki Cable capability in July 2018, transferring all REANNZ members over by August 2018.
- › Upgraded our national backbone network to a 100 Gbps (gigabytes per second) link from Auckland to Dunedin, comparable to advanced networks in Asia, Europe, Canada and the United States.
- › Prepared to host APAN46 (Asia Pacific Advanced Network Conference) in August 2018. This will be the first time in 10 years that APAN has been hosted in New Zealand. Over 300 members will attend from Asia Pacific's largest and fastest-growing economies.
- › Gained three new members.
- › Prepared to host the National Research and Education Network (NREN) CEO Forum in 2019 – a major event involving the world's 16 largest NRENs.
- › Got ready to facilitate country-to-country initiatives, including a planned new NZ\$57 million bilateral data science and food science partnership with Singapore.

BOARD CHAIR'S REPORT /



Chief Executive Nicole Ferguson and Acting Chair Ross Peat with the Minister of Science, Research and Innovation Hon Dr Megan Woods following her opening address at APAN46, which was hosted by REANNZ and held in New Zealand for the first time in ten years.

This is a pivotal and transformational time for REANNZ and its role in providing core networking infrastructure for New Zealand researchers.

New Zealand's ambitions as a digital nation are growing apace just as our research and education sectors are accelerating rates of data-intensive research and global collaborations.

REANNZ is working hard to ensure that New Zealanders have access to super-fast network infrastructure, services and tools that meet global research and education standards while providing fair-value services and pricing structures that address the wide-ranging requirements of our members.

To remain agile and responsive, REANNZ has been engaging with key stakeholders to design, structure and transition to a new business model. We want to ensure the sustainability of this essential research and education infrastructure and its ability to support the achievement of New Zealand's science and digital nation policy goals. The new REANNZ business model,

which will be rolled out in late 2018, will reflect the broad range of needs of the tertiary, research and innovation organisations that we serve.

In addition to evolving our business model, we are also contributing to the Minister's review of future research needs and future connectivity needs, led by the Ministry for Business, Innovation and Employment (MBIE). The outcomes of this review, due in late 2018, will be instructive for REANNZ and other infrastructure providers as it will establish pathways forward for the New Zealand research sector.

Demand for our network services continues to accelerate. Our investments in international connectivity with the new Hawaiki Cable and in our national network capacity upgrades, ensure that New Zealand has the future capacity to support our research and education sectors with infrastructure and services that meet global NREN standards.

Many New Zealand universities and research institutions are transitioning, or considering

transitioning, to 100 Gbps services, putting them on a level playing field with their research partners in the United States, Asia, Canada and Europe. It is essential that New Zealand sustains its research network performance and service levels to ensure our researchers and research institutions can continue to collaborate and compete effectively with the rest of the world.

We recognise that New Zealand's tertiary sector is facing multiple challenges, including fiscal constraints, slipping or plateauing in world rankings, and major reviews of the ITP sector and their delivery models. This has resulted in a few members choosing not to renew their REANNZ membership for 2018-19 but we hope to attract them back following changes to our membership model.

We are ready and able to support international research collaborations which in turn contribute to positive university rankings and to the economic, social and cultural success of New Zealand.

Looking ahead, as we transition the REANNZ business model, we see real opportunities for a traditionally competitive sector to come together to pursue common goals including: new ways of leveraging specialist expertise, centralising services, and gaining benefits from the collective scale of the sector across a broader range of IT and eResearch functions. REANNZ sees potential to achieve cost saving for our members and to deliver tailored network and research outcomes that fit the unique nature of this sector.

Finally, we welcome three new directors to the REANNZ Board: Sara Brownlie, Dr Judith Johnston, and David Skinner. We look forward to the skills and experience they bring to the Board at this pivotal time. I would also like to acknowledge our departing Chair, Jim Donovan, and directors Susie Johnstone and Simon Hall, who have all made significant contributions to the development and growth of REANNZ over their tenure.

"...we see real opportunities for a traditionally competitive sector to come together to pursue common goals"

In conclusion, the significant achievements of the year, with the upgrades in network capacity and capability both nationally and internationally, the super reliable performance of the network platform, and the extensive engagement across all stakeholders as we work towards a sustainable model, would not be possible without a committed and passionate team. We are all confident in and committed to building a better future for researchers, scientists, academics and students, and supporting New Zealand's national goals and ambitions; and we are confident that REANNZ has the resources and capabilities to achieve this.



Ross Peat
Acting Chair

OUR BOARD /

Throughout 2017-2018, up until 30 June 2018, REANNZ was fortunate to be served by the same experienced directors from prior years. The tenure of three directors, including our Chair, Jim Donovan, ended on 30 June 2018. Ross Peat was appointed Acting Chair from 1 July 2018.



Jim Donovan, Chair*

Jim is a professional director with wide experience in the public and private sectors, including technology-based businesses and tertiary education. In addition to REANNZ, he is Chair of Isambard Limited and Skylight Trust, and a director of Winston Group Limited. He is a Chartered Fellow of the Institute of Directors.



Ross Peat, Deputy Chair/Acting Chair

Ross is Executive Director and co-owner of health technology companies HealthSoft New Zealand Limited and HealthSoft Australia Limited, and Deputy Chair of New Zealand Health IT. He is a Founding Investor of Tuhua Ventures (angel and early-stage investment), a member of the Ice Angels and a director of AUT Ventures Limited.



Professor Simon Hall*

Simon is Head of the Institute of Fundamental Sciences and Deputy Pro Vice-Chancellor (Academic) for the College of Sciences at Massey University. He is a Professor of Electrochemistry at the university and two companies have been spun out based on his research on rechargeable batteries.



Professor Steve Weaver

Steve was formerly Deputy Vice-Chancellor (Research) and Head of Geological Sciences at the University of Canterbury. He serves on the Board of GNS Science Limited, is a member of the Governance Group of the Resilience National Science Challenge and is a Fellow of the Royal Society of New Zealand.



Susie Johnstone*

Susie is based in Balclutha where she is the Managing Partner of Shand Thomson. Susie is a Fellow of Chartered Accountants Australia & New Zealand and of the Institute of Directors, and is the Independent Chair of the Audit and Risk Committee of the Dunedin City Council and the Southern District Health Board.

CHIEF EXECUTIVE'S REPORT /



REANNZ Chief Executive Nicole Ferguson and Dr David Lassner, President of the University of Hawai'i signed a memorandum of understanding to enhance connectivity and collaboration across Oceania, the wider Pacific and into Asia.

Research & Education at the speed of thought /

It has been a significant year for REANNZ. We have taken the next steps in REANNZ's development and implemented a step change in network capability to support the exceptional growth in international collaboration by our members.

Exceptional growth

We've seen a 61% increase in the amount of data flowing between New Zealand's research and education institutions and their international counterparts over the last year. This is a significant jump which reflects the improved data-science and data-transfer capability in many of our leading research institutions.

To meet this growing demand, this year we have increased capacity along our key backbone network from Dunedin to Auckland, transitioning from 20 Gbps to 100 Gbps. This puts New Zealand researchers on an equal footing with

their research partners and institutions across Asia, the United States, Canada and Europe.

We have also successfully planned and delivered a new international network. Transitioning to the new Hawaiki trans-Pacific fibre network provides greater flexibility in the way we design and deliver research and education services for our members. This milestone project has involved multiple streams of work including: establishing new physical infrastructure points overseas; working with New Zealand telecommunications partners to extend our national network footprint; and enhancing our partnerships with international research networks to ensure fast, seamless connectivity to the global research and education network

REANNZ has an anchor tenancy on the Hawaiki Cable on behalf of New Zealand's research community. The launch of this new trans-Pacific, carrier neutral, submarine cable system not only offers REANNZ and our members fast and future-proofed capability but also supports New Zealand's goals of resiliency and improved market competition. New Zealand researchers now have dedicated specialist

"We've seen a 61% increase in the amount of data flowing between New Zealand's research and education institutions and their international counterparts"

research connectivity to Australia and the United States, either as a destination or as a gateway to Asia, Europe, South America or Africa. It enables rapid transfers of vast amounts of data to researcher's colleagues offshore, and access to resources that involve the transfer of huge volumes of data to New Zealand.

We therefore welcomed New Zealand's new ambitions for data-science and international collaboration, announced in Budget 2018. The Budget sets out significant new investments and international partnerships led by MBIE's Strategic Science Investment Fund (SSIF). It is critical that our network platform continues to grow in order to meet the current and future needs of research, science and education, and international standards for network service delivery, for the global community of researchers, scientists and students.

Our network is tailored for the unique needs of collaborative research and education and ready for the future. During the year we worked with a cross-membership technical team to benchmark our network against commercial internet providers. This testing provided clear evidence that the specialist connectivity provided by REANNZ as part of the global research and education network, is crucial for effective science and research collaboration. You can see the results of that testing on page 18.

Looking to the future

Our year has also been focused on working with MBIE and members to identify a sustainable and future-focused business and funding model to support this essential platform. We held over ten stakeholder meetings in the first half of the financial year, which resulted in an acknowledgment from all stakeholders that a national research and education network (NREN) is core infrastructure for New Zealand's research and education community.

In addition, we have been working with stakeholders to develop a new four-year building-block cost framework, service structure and pricing model which will take REANNZ through to the next major capital investment point in 2022/23. The new model will be ready to roll out in December 2018.

Alongside this, the establishment of a new strategic stakeholder engagement model will improve our members' ability to input into future investment decisions, and the strategic direction of the network platform.

This work will provide the foundation upon which REANNZ will become a truly stakeholder-centric organisation.

Diverging capability

At the end of the financial year, with bi-annual member contracts due for renewal, three universities and four ITPs elected to leave REANNZ and the global NREN infrastructure, to address their research and education services through local providers.

Over time, we have noted greater diversity in institutional capability and support for data-intensive science and research, particularly across the university sector. Some institutions are implementing or exploring options for 100 Gbps network access, while others are at the sub-5 Gbps end of the spectrum. This growing diversity, coupled with significant fiscal constraints across the tertiary sector, is making access to NREN services a challenge for some less research-intensive institutions. How we address this dynamic has been a key part of the review of our model and REANNZ is working closely with members and government officials on this issue.

As an increasingly digital and data-driven nation, this growing diversity in capability is a concern. Consideration is needed about what this might mean for our ability as a country to meet our goals and obligations across environmental, health, and geosciences research and

development. All of these areas are increasingly data intensive and require significant collaboration and access to specialist research applications, data and tools.

Prudent financial management

Our financial results for this year were strong, a result of very careful investment planning and operational cost management reflecting the current climate. As a not-for-profit organisation, we manage our finances very carefully, we accumulate funds for future investments in accordance with our mandate, and all reinvestments are focused on improving services to meet our members' needs.

Our cash position is reflective of an organisation whose business model requires saving for network upgrades and major capital asset replacements without borrowing. Over the last year, we have made deliberate decisions to reduce capital expenditure in favour of shorter-term service agreements to preserve our medium-term cash position, in light of member churn and the lead up to major network replacement points in 2022/23. This approach has provided REANNZ, Government and our members with the runway to be able to explore and transition over time to a new operating model.

We continue to actively review our operational and network expenditure to ensure we can deliver the level of service required to achieve New Zealand's research and education policy goals as efficiently as possible.

International role and engagement

Internationally, REANNZ continues to play an important role in the global NREN community, representing New Zealand's interests and supporting the development of a highly scalable, interoperable and specialist global research infrastructure.

We represent New Zealand in the Asia Pacific Advanced Networking (APAN) community, which is made up of some of the largest and fastest growing economies and highest ranked universities in the world. We are working with colleagues across Asia Pacific to pursue opportunities to improve the connectedness of the Pacific, partnering with other NRENs to contribute to shared infrastructure.

REANNZ was proud to host the successful APAN46 meeting in Auckland in August with the opening address delivered by the Minister for Research, Science and Innovation, the Hon Dr Megan Woods.

During the year we developed strong relationships with Internet2 (the USA national research and education network) and the University of Hawai'i, which culminated in signing memorandums of understanding with the respective organisations. We look forward to realising their potential further in 2018-2019.

REANNZ is also fortunate to be one of just 16 NRENs invited to participate in the Global Research and Education Network Forum, to advance the goals of research and education worldwide through better co-ordination, collaboration and co-investment in tailored infrastructure and services. We look forward to hosting this forum in New Zealand in 2019.

Acknowledgements and thanks

Finally, as I head off on parental leave, I am pleased to be leaving the organisation in highly capable hands, with a dedicated team that is passionate about our purpose and role in enabling researchers, scientists and academia to succeed. Their dedication and commitment has been incredible in the face of significant uncertainty and challenge, for which I am very grateful.

I'd also like to thank our membership and other key stakeholders for the significant time and effort they have contributed through many hours of meetings and discussion over the last year.

He tangata, he tangata, he tangata.



Nicole Ferguson
Chief Executive

CASE STUDY /

REANNZ members benefit from Hawaiki Cable connection



In July 2018, the world's newest submarine internet cable opened for business. The 15,000 kilometre umbilical cord links New Zealand with the US, Australia and the Pacific Islands. REANNZ members are among the first to benefit from this ultra-high-speed connection.

With a blistering design capacity of 43.8 Tbps (terabytes per second), the Hawaiki Cable is built for speed – just what New Zealand's research and academic community needs. Being able to transfer vast amounts of research data to colleagues offshore, with minimal downtime and packet loss, is of the essence. Hawaiki fits the bill perfectly.

REANNZ's history with the Hawaiki Cable goes back some years. A NZ\$65 million contract, providing REANNZ with 25 years of capacity on the cable, was signed back in 2014. Now, after years of planning and construction, the Hawaiki Cable is REANNZ's primary international bandwidth provider.

All REANNZ members have been migrated over to Hawaiki. They are benefiting from 20 Gbps connectivity to mainland US and Australia. This will increase to 2 Tbps over the duration of the contract.

Led by a team of specialists from US firm TE SubCom, the Hawaiki build was a feat of administration and engineering, par excellence. Traversing 12 exclusive economic zones,

a battery of permits, easements, resource consents and licences was required before construction could begin.

Two state-of-the-art ships then spent six months laying the Hawaiki Cable onto the ocean floor. The cable contains so much fibre that if stretched out as a single strand it would loop twice around the equator.

The Hawaiki Cable lands at Mangawhai in Northland. From there, it connects to REANNZ's North Shore and central Auckland network points of presence (PoPs), courtesy of backhaul contracts negotiated with local telecommunication companies Vodafone and Chorus.

The US landing point is at Oregon in the Pacific North West. In total, there are five Pacific landing points, encompassing a population of over 350 million people.

REANNZ's investment in the Hawaiki Cable not only gives members from across the research community access to one of the newest, most advanced submarine cable systems in the world, it has also helped stimulate the entry of a much-needed second international cable provider for New Zealand.

For years, New Zealand's only direct submarine link to the US was via the Southern Cross Cable. The entry of Hawaiki is a game changer in improving the resilience of New Zealand's internet connectivity with the global community.

ABOUT US /

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.

We have 47 member organisations, including universities, Crown Research Institutes (CRIs), Institutes of Technology and Polytechnics (ITPs), wānanga and other organisations from New Zealand's research, education and innovation sectors.

Small, specialist REANNZ teams based in Wellington, Auckland, Christchurch and Dunedin provide our members with first-class technical support and service.

OUR PURPOSE /

We own and operate New Zealand's ultra-high-speed, high-performance NREN. The network supports the education, research and innovation sectors for the benefit of New Zealand, nationally and internationally.

We provide researchers, scientists, innovators and educationalists with the specialist infrastructure, connectivity, support and services they need to seamlessly access, share, transfer and store big research data.

Our specialist high-capacity network is engineered to enable huge research data flows to move quickly and efficiently between national and international research and education institutes. The network is an important part of New Zealand's science capability and is needed for high-value international science and research collaborations.

Our specialist backbone network stretches the length of the country, from Invercargill to Auckland, through Australia and the US, and on to other members of the global research, education and innovation community.

Our network lets New Zealand researchers participate in and lead cutting-edge international research that addresses a number of pressing global issues, including climate change, cancer, genomics and natural hazards.

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 for all New Zealanders through improved educational, social, economic and environmental outcomes.

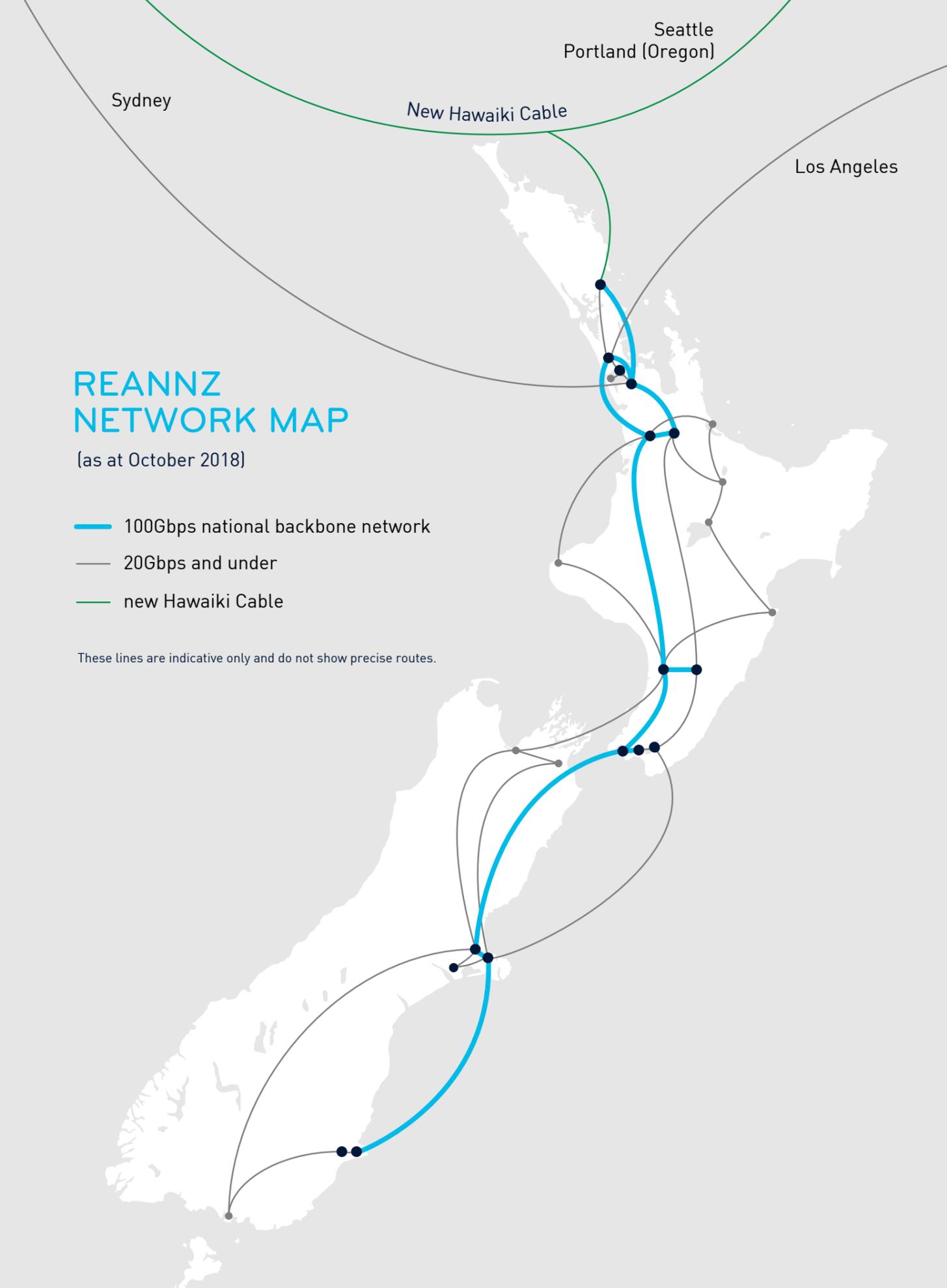
Access to the REANNZ infrastructure provides a platform where transformational change can take place. It creates opportunities to disrupt the way education is delivered, revolutionise research methods, improve scientific outcomes and increase productivity in unprecedented ways.

REANNZ NETWORK MAP

(as at October 2018)

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

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



OUR VALUE /

NEW ZEALAND'S NREN

NRENs like REANNZ exist to provide specialist networking at levels of performance, quality and reach necessary for effective research and science to take place. NRENs also serve an important demand-side purpose – supporting and helping the world's researchers orchestrate and coordinate their activities.

We procure, operate and manage New Zealand's specialist research network, making sure it is fit-for-purpose for the unique needs of our members. Network features include:

- › Speed: the ability to quickly transfer huge datasets – hundreds of gigabytes, terabytes and petabytes are common.
- › Quality: zero tolerance for packet loss, which is catastrophic for long-distance data transfer.
- › Performance: the ability to accommodate bursty and unpredictable science and research traffic, which is unlike enterprise or residential use.
- › Reach: NRENs are highly collaborative, involving multiple users across multiple institutions both nationally and internationally, contributing to and sharing expensive infrastructure.
- › Specialist expertise and support for complex and customised needs, including bespoke applications and protocols.

REANNZ's specialist research and education infrastructure, together with its global partnerships with over 120 equivalent specialist networks, means its capabilities when carrying out large data transfers are unmatched by commercial internet service providers.

NATIONAL SYSTEMS MANAGER

We perform the role of New Zealand's national systems manager. This involves:

- › Maintaining New Zealand's access to NRENs around the world, and collaborating with them to provide high-performing global reach.
- › Enabling New Zealand to adopt and advance international research and education-specific services such as eduroam, and identity and access management platforms (such as the platform on which Tuakiri – REANNZ's federated identity service – is based).
- › Influencing global network architecture to align standards and prepare for the next generation of data intensity. These discussions are only open to NRENs, and are essential in making sure New Zealand's network remains compatible and interoperable with global network standards, features and protocols.
- › Representing New Zealand's interest in global forums and making sure New Zealand maintains a leadership position in science and research capability.
- › Focusing on the future – making sure users have the capability they need when they need it.
- › Managing the timing of technology upgrades to ensure they are cost-effective and meet leading-edge research requirements.
- › Making sure our local research and education community is aligned on technology initiatives – especially those that support cross-sector programmes like the government's National Science Challenges and Centres of Research Excellence, and access to common local platforms like New Zealand eScience Infrastructure's (NeSI) high-performance computing facilities and genomics infrastructure, eg, bio-IT and sequencing platforms.
- › Working together across our research and education sector to combine resources, resulting in increased production for lower expenditure, and improved value-for-money for our members.

- › Providing specialist expertise and support in networking and moving data, including support to end-users and institutional IT teams.
- › Working with a variety of stakeholders, including government, to advance research and education policy objectives nationwide.

We take our responsibilities seriously, listening to the requirements of researchers, data-intensive users and IT teams to help them find the right solution, connect them with the right people and assist them in gaining access to the best technology tools.

OUR GLOBAL ROLE /

As New Zealand's National Research and Education Network (NREN), we are an active member of a global collaboration of over 120 other national and regional research and education networks.

We work together with our international peers to connect global research organisations, enable research collaboration, facilitate massive data flows and provide seamless high-performance connectivity.

We collaborate with the world's other NRENs to improve the ability of our best and brightest to share data, access facilities and make groundbreaking discoveries.

Thanks to REANNZ and our involvement in this global network of NRENs, Kiwi researchers gain access to a worldwide, multi-billion-dollar research and education infrastructure, dedicated to the pursuit of science, research and education, and based on long-established working relationships, shared practices and operational protocols.

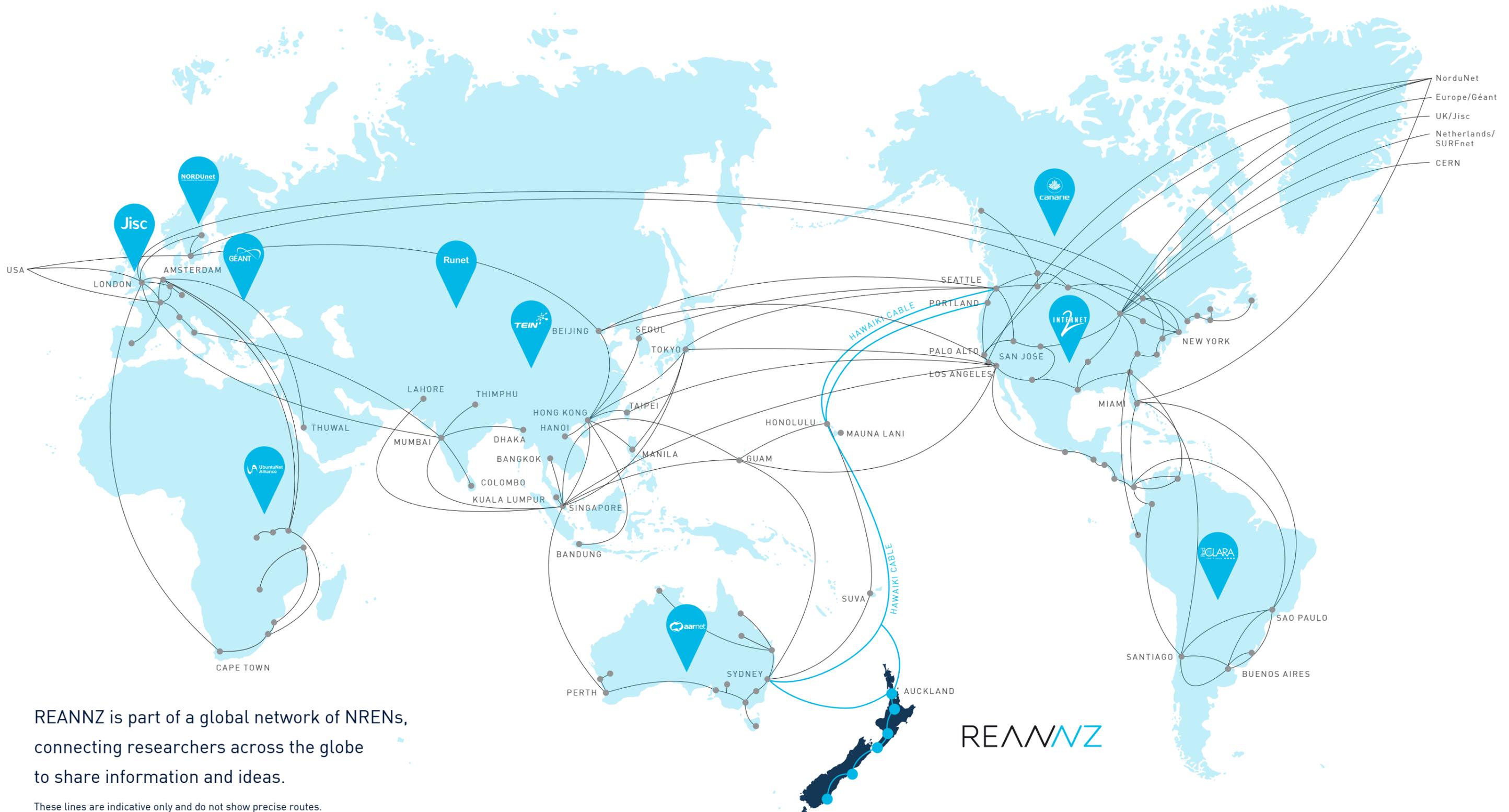
Globally, research and education networks are 'closed systems'. Participants contribute to and use long-term infrastructure platforms like ours to facilitate research access and collaborate with other researchers internationally. eduroam (education roaming: the secure, worldwide roaming access service developed for the international research and education community) and eduGAIN (the global federated identity management

system), for example, are managed by the global advanced network community for NREN members.

"We are an active member of a global collaboration of over 120 other national and regional research and education networks."

REANNZ is the smallest NREN to have a seat at the table of the international Chief Executive's Forum of the 16 key NRENs in the world. We are proud to be hosting the next CEO Forum in New Zealand in February 2019, where important new country-to-country conventions will be endorsed.

GLOBAL RESEARCH AND EDUCATION COMMUNITY /



REANNZ is part of a global network of NRENs, connecting researchers across the globe to share information and ideas.

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

CASE STUDY /

Specialist NREN networks outperform commercial providers for large scientific data transfers

Tests carried out in 2017 showed the REANNZ advanced network outperformed commercial internet service providers for large research data transfers.

The REANNZ network is specially configured to successfully manage huge research and education data transfers, which differ markedly from enterprise or residential use. These big data transfers are bursty and unpredictable, potentially taking place over hours, days or weeks, and transfers of hundreds of gigabytes, terabytes and petabytes are common.

Data integrity is also paramount and REANNZ actively monitors and measures any packet loss. Just imagine the impact of data loss on a genomic sequence!

The performance testing found:

- › A commercial provider was unable to send a large research-grade dataset from New Zealand to Europe. Data transfer rates only reached 2.7 Gbps before failing entirely – see Figure 1 below.
- › In comparison, the same dataset was successfully sent over the REANNZ network over a six-hour period, reaching 9.98 Gbps and achieving a 99.9997% delivery quality – see Figure 2 below.
- › A 10 Gbps research connection transferred data to Australia at almost 100% efficiency in approximately one day. However, the same transfer through a commercial provider would take almost four times longer. A transfer test to Europe would take 12 times longer.

The performance testing report stated: “[T]his highlights a systemic problem caused by the commercial realities of commodity service providers. It is not commercially viable to appropriately support the research community through commercial, commodity internet providers.”

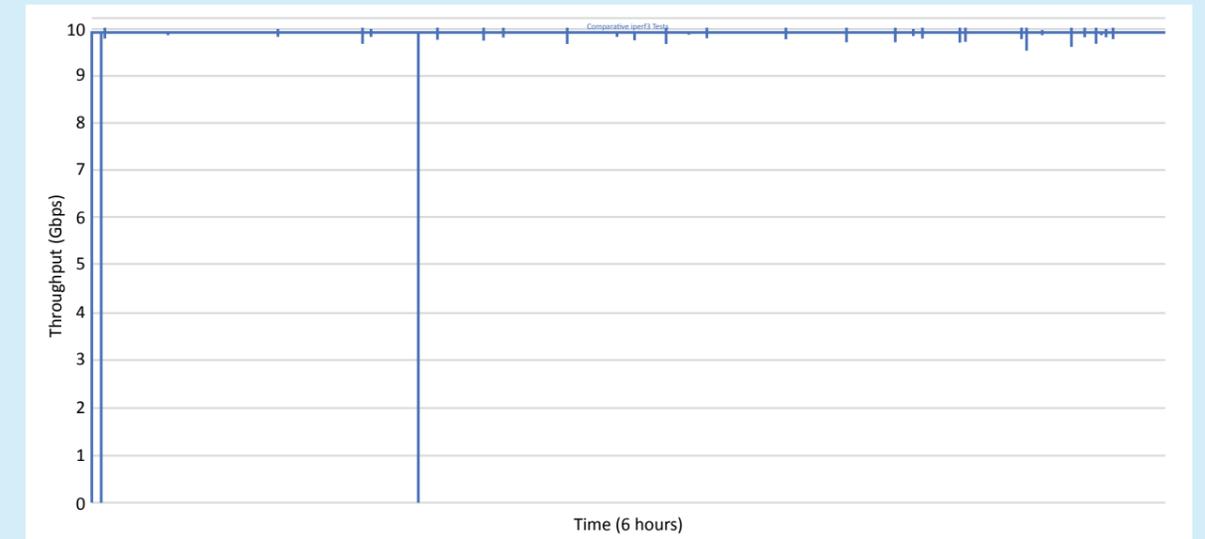
Figure 1 shows how a commercial provider was unable to send a large research-grade dataset from New Zealand to Europe. A data transfer rate of only 2.7 Gbps was reached before the transfer failed entirely.

Commercial provider's transfer to Europe



Figure 2 shows the same dataset which was successfully sent over the REANNZ network in six hours. It reached 9.98 Gbps and achieved delivery quality of 99.9997%.

REANNZ transfer to Europe



High-performance research and education networks like REANNZ aren't just about size and speed of transfers. They also make collaboration possible as never before – across institutions, borders and disciplines. They enable whole new ways of thinking and working, which in turn spark new possibilities and create breakthroughs in resolving the pressing issues of the day.

These networks also mean that New Zealand researchers and innovators can take their place on the world stage and be an active part of game-changing global initiatives across great distances, and all because of specialist technology.

Source: REANNZ performance testing report 2017.

"...it is not commercially viable to appropriately support the research community through commercial, commodity internet providers."

OUR PRODUCTS AND SERVICES /

Our products and services are tailored to meet and support the specialist research and education needs of REANNZ members.

SPECIALISED RESEARCH AND EDUCATION NETWORK SERVICES

Member access

REANNZ members benefit from:

- › Unlimited direct access to all other REANNZ members, eg, national research and education institutions.
- › Unlimited direct access to national science and research tools and applications, eg, NeSI and Catalyst Cloud Compute.
- › Unlimited use of the network to reach other domestic cloud service providers, including data centres and *aaS (as-a-service) providers.

National research and education connectivity

- › Domestic REANNZ transit (member-to-member research and education traffic)
Enables members to transfer data at speed to any other member connected to the REANNZ network.
- › Private WAN services
Enables members to privately connect multiple remote facilities using the REANNZ network.
- › Domestic internet peering services
Enables members to connect to all major New Zealand internet peering exchanges. There is no limit to the volume of domestic internet traffic a member can consume.
- › Caching
Enables members to access international internet content served from REANNZ-hosted local caches. These caches are provided by globally known content sources, ie, Google, Facebook, Akamai and Netflix. There is no limit to the volume of content a member can consume from the caches.

International research and education connectivity services

- › Enables REANNZ members to exchange large volumes of data at high speed with research and education institutions connected to other NRENs in over 120 countries.

eduroam

- › Developed by the collective international research and education community, eduroam lets faculty, staff and students connect to tens of thousands of hotspots in 89 countries.

REANNZ international internet

- › Enables members to connect to international internet destinations.

OTHER SERVICES

REANNZ also offers the following optional services:

- › Identity and access management
 - Tuakiri, federated identity management service
- › Security
 - Managed network-hosted firewall service, including remote-access VPN (virtual private network)
- › Cloud Connect
 - Amazon Web Services (AWS) DirectConnect
 - Microsoft Azure ExpressRoute
- › Managed access and edge services
 - Managed edge devices, such as routers and switches
 - Managed access circuits, such as dark fibre
- › REANNZ Member Portal
 - Traffic usage statistics portal
- › Consultancy and support
 - Network architecture, design and consulting for research and education
 - Science and research data transfer services, including design, troubleshooting and support
 - Technical training, support and advocacy.



REANNZ's new Hawaiki Cable capacity provides researchers with dedicated, specialist research connectivity to the United States and Australia and a gateway to Asia, Europe and beyond. Pictured at REANNZ's launch are: Professor Richard Blaikie (Deputy Vice-Chancellor Research and Enterprise, University of Otago), with REANNZ Chief Executive, Nicole Ferguson, and Rémi Galasso (Chief Executive, Hawaiki Cable).

CASE STUDY /

Supercomputing transfer goes off without a hitch

When the NeSI supercomputers were replaced in early 2018, REANNZ engineers were on hand to make sure the research and education advanced network smoothly handled the transfer of an estimated 900 TB (terabytes) of user data.

NeSI – the New Zealand eScience Infrastructure – makes supercomputing facilities available to scientists through REANNZ’s high-speed network, which links universities and research institutes.

A collaboration between NIWA, Landcare Research and the universities of Auckland and Otago, NeSI is helping researchers solve some of today’s most pressing scientific problems.

Earlier in 2018, NeSI’s supercomputers – ‘FitzRoy’, based at NIWA’s Greta Point, Wellington site, and ‘Pan’, based at the University of Auckland – were replaced with new machines able to deliver up to 10 times the computing capability and four times the storage capacity of their predecessors.

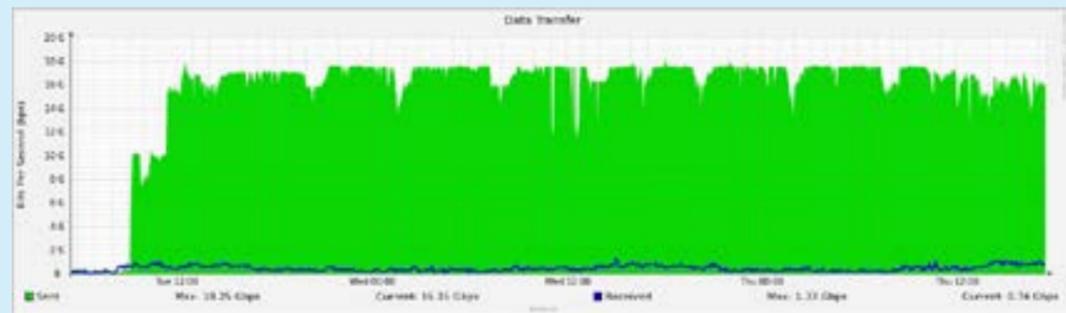
It was no small task. Alongside logistics, physical handling, cabling, electrical work and testing, tens of millions of files and hundreds of terabytes of user data had to be migrated to the new machines – ‘Maui’ and ‘Mahuika’ in Wellington, and ‘Kupe’ in Auckland.

Using the REANNZ network was essential for supporting the massive transfer. REANNZ engineers rebalanced the traffic in the early stages of the transfer to ensure NIWA was able to make the best use of their capability.

The REANNZ network worked overtime on the transfer. Peak transfer speeds topped 19 Gbps. It amounted to the largest one-off transfer of data ever undertaken on the REANNZ network. Testament to the network’s speed, resilience and capacity, there was little to no disruption to regular user operations.

NeSI is planning for the new supercomputers to have three- to six-year lifetimes, with a major technology refresh halfway through – more than enough time to help power the next frontier of scientific research.

"...with peak transfer speeds topping 19 Gbps it was the largest one-off transfer of data undertaken on the REANNZ network."



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.

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.

While REANNZ is not a Crown Entity under the *Crown Entities Act 2004*, it is however the intent of shareholders that 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 five directors appointed for the year ending 30 June 2018.

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 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 eleven scheduled and one special meeting during 2017/18, and convened for six special meetings (two Audit and Risk Committee meetings, two HR Committee meetings and two strategic planning meetings).

Board committees

The Board has formally constituted an Audit and Risk Committee to focus on audit and risk management

issues. Two members of the Board are on this committee, and the committee met two times during 2017/18. The Board also has an HR Committee to advise on remuneration, performance and other employment-related issues. Two Board members served on this committee and it met twice during the year. The Chairperson of the Board is an ex-officio member of both of these committees.

Board changes

There were five directors during the 2017/18 financial year. The tenure of three directors, including our Chair, Jim Donovan, ended on 30 June 2018. Ross Peat was appointed Acting Chair from 1 July 2018 until 31 March 2019.

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 infer from the circumstances that the director or staff member's judgement is likely to be influenced.

An 'interests register' of director's and executive'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

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-advanced research, education and innovation

OUTCOMES to succeed

Outcomes

Sector Outcome

Grow the NZ economy to deliver greater prosperity and opportunity 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.

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 WEF global competitiveness index
- > Maintain NZ ranking for "capacity for innovation" in the WEF global competitiveness index.

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
- > Traffic to international research networks increase 5% YoY
- > > 80% users consider REANNZ network essential or valuable to their work.

Collaboration between science, education and innovation is enhanced

Impact measures

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

Users have access to the content and tools they need

Impact measures

- > Subscriptions to other services increase by 10%

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 service offering increase
- > eduroam usage

Timeliness measures

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

Cost-effective measures

- > Membership base is maintained

OUR OUTPUT /

The advanced research and education network and supporting services

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 2018

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 2018.



Ross Peat
Acting Chair



Steve Weaver
Director

17 October 2018
Signed on behalf of the Board

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 42 to 60, that comprise the statement of financial position as at 30 June 2018, the statement of comprehensive revenue and expenses, 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 32 to 41.

In our opinion:

- › the financial statements of REANNZ on pages 42 to 60:
 - present fairly, in all material respects:
 - its financial position as at 30 June 2018; 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; and
- › the performance information on pages 32 to 41:

- presents fairly, in all material respects, REANNZ's performance for the year ended 30 June 2018, 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 2018. 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 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 27, but does not include the financial statements and the performance information, and our auditor's report thereon.

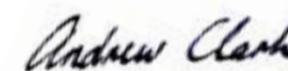
Our opinion on the financial statements and the performance information does not cover the other information and we do not express any form of audit opinion or assurance conclusion thereon.

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

STATEMENT OF SERVICE PERFORMANCE /

For the year ending 30 June 2018

Our suite of performance indicators tracks trends on our high-level outcomes. Our indicators measure the impact we have made, and the quality, quantity, timeliness and cost-effectiveness of our output, the advanced research and education network and supporting services.

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 grow the New Zealand economy to deliver greater prosperity and opportunity for all New Zealanders.</p>	<p>New Zealand maintains its position in the top 500 universities per GDP, as shown in the OECD Science, Technology and Industry Outlook, 'Comparative performance of national science and innovation systems', published every two years.</p>	<p>New Zealand has a current ranking of 200 in the top 500 universities per GDP. The ranking was published on 8 December 2016. A new report will be available late 2018.</p>
<p>REANNZ outcome</p> <p>To enable New Zealand's research, education and innovation sectors to thrive through the provision of tailored digital infrastructure, support and services.</p>	<p>New Zealand maintains its ranking for 'university-industry collaboration in R&D' in the World Economic Forum global competitiveness index.</p>	<p>New Zealand's ranking moved from 19th place in 2016/17 to 17th place in 2017/18 for 'university-industry collaboration in R&D'. The current ranking was published on 26 September 2017.</p>
	<p>New Zealand maintains its ranking for 'capacity for innovation' in the World Economic Forum global competitiveness index.</p>	<p>New Zealand's ranking remained constant at 17th place for both 2016/17 and 2017/18. The absolute value of this measure of 5.3 has remained the same over the past three reports. The current ranking was published on 26 September 2017.</p>

Improvements in a country's capacity for innovation and university-industry collaboration 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 across 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

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

A number of science initiatives with large data requirements are being conducted that could not occur without the reach, reliability and speed of an advanced network. Examples include high-performance computing applications in research, like the climate and geological science facilitated by the NeSI project, genomics work with international collaborators, and radio astronomy data analysis related to the international Square Kilometre Array project. All of these involve 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 recent performance testing, 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 in 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

	Result June 2017	Target June 2018	Result June 2018
Total traffic flows increase			
Year-on-year growth	+54%	+30%	+25%
Total traffic volume	42.38 PB	55.09 PB	52.98 PB

Measurements are in petabytes (PB)

REANNZ year-on-year traffic growth was lower than the target of 30% over the last financial year. This was due to lower levels of international traffic growth over the final quarter of the year as some members, who subsequently left REANNZ at the end of the year, transitioned to their alternative provider.

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

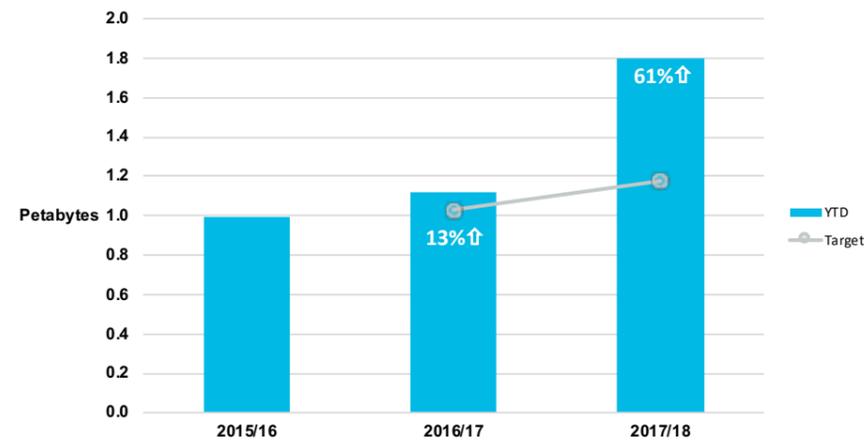
Research and education traffic (traffic flowing internationally between REANNZ members and members of global NRENs) increased 61% for the year ending 30 June 2018, compared with the previous year.

Measure	Result June 2017	Target June 2018	Result June 2018
Total traffic destined for international research and education networks	+1% 1.12 PB	+5% 1.18 PB	+61% 1.80 PB

Measurements are in petabytes (PB)

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 sent over a longer timeframe.

Research & education traffic growth



This measure 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.

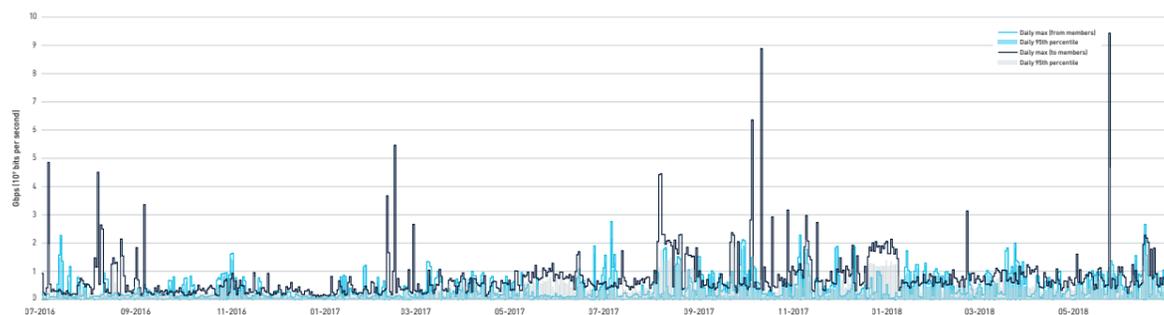
However, an increasing or decreasing total volume of traffic transferred is not, of itself, the only representation of the value of the connection. Focusing on this traffic measure alone ignores the performance features of our network that make it possible for large datasets to be transferred over long distances. 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.

Continued growth is reliant on:

- › Changes in the incentives for researchers and institutions to undertake data-intensive research programmes with international participants and to use international research infrastructures;
- › Increases in the capability (with regard to both technology and skills) of our members to support the transfer of data inside their organisation.

The graph below shows the increasing overall traffic speeds in 2017/18, and international traffic bursts typical of data-intensive science.

Daily international research and education traffic



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

Measure	Result June 2016	Result June 2017	Target June 2017	Result June 2018
Users consider the REANNZ network essential to their work	80%	81%	>80%	N/A
Users consider the REANNZ network valuable to their work	16%	13%		N/A
Total	96%	94%		N/A

As part of our initiative to revise our business model, REANNZ surveyed staff from all core members in June 2018. REANNZ consulted with members through the Member Services Consultancy Group (MSCG). The survey was sent to all core members to attain feedback on how members valued REANNZ current services. The outcome of the survey (which was presented to the MSCG in July) showed an overall value rating of the advanced network services of 2.7 (out of 3 to rate the services as significant value, and 4 to rate the services as critical). The survey was responded to by 57 staff from core members spanning multiple functions, including members who left on 30 June.

This survey about REANNZ services, was not the same survey as prior years and given the high level of engagement (and surveys) generated from the review, it was decided an additional survey would not add any value. REANNZ is working with members through the MSCG on a revised business model, which is also aimed at regaining lost members. The member engagement will continue until the end of the 2018 calendar year.

The member survey will resume in the 2018/19 year.

Impact: 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.

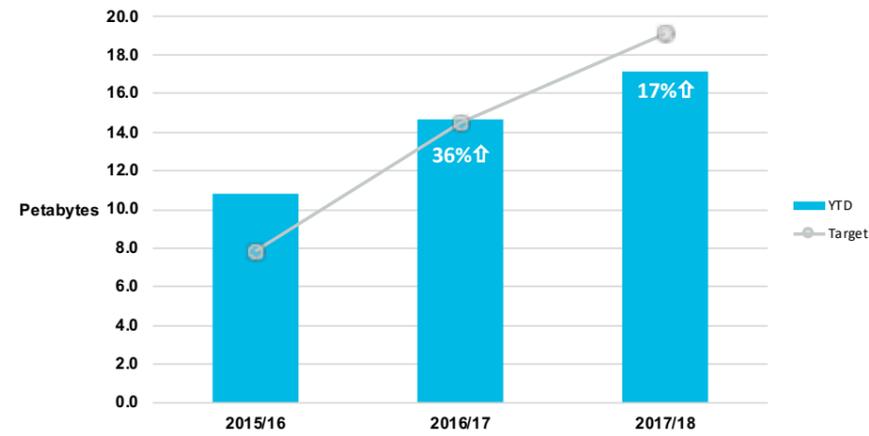
REANNZ has experienced exceptional growth over the past few years, in both international and national traffic volumes, as network upgrades have been implemented.

Measure	Result June 2017	Target June 2018	Result June 2018
International traffic volume			
Year-on-year growth	+36%	+30%	+17%
Total traffic volume	14.69 PB	19.10 PB	17.12 PB
National traffic volume			
Year-on-year growth	+65%	+30%	+30%
Total traffic volume	27.69 PB	35.98 PB	35.86 PB

Measurements are in petabytes (PB)

Goal: International traffic volumes increase

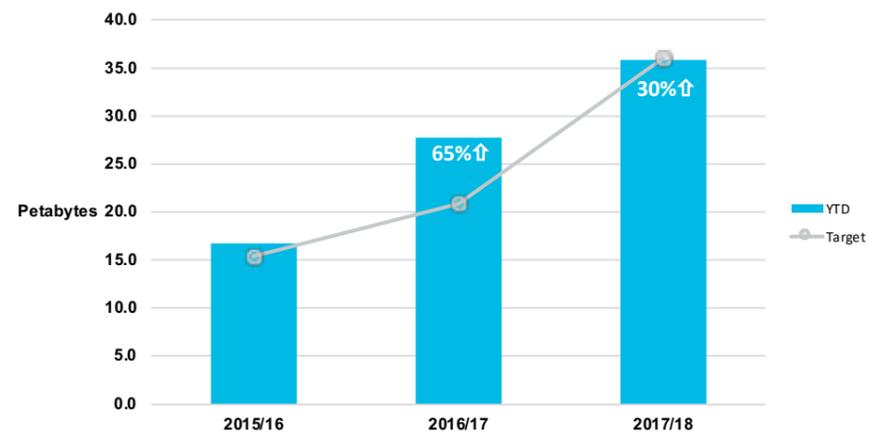
International traffic growth



REANNZ year-on-year international traffic growth was lower than the target of 30% over 2017/18. This was due to lower levels of international traffic growth over the final quarter of the year as some members, who subsequently left REANNZ at the end of the year, transitioned to their alternative provider.

Goal: National traffic volumes increase

National traffic growth



REANNZ year-on-year national traffic growth was on target at 30% over 2017/18.

Impact: Users have cost-effective 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.

Measure	Result June 2017	Target June 2018	Result June 2018
Subscriptions to services increase	+7%	+15%	+16%

Over recent years, REANNZ has worked to bring new value-added services to the community. During 2017/18 there has been a growth in the uptake of our managed firewall and Cloud Connect services, and continued uptake of our managed services. Subscriptions to our services increased by 16% in 2017/18, with 28 new managed services sites added by both existing and new members during the year.

Measuring our output

Output: Provide the REANNZ network and support the member community

REANNZ benchmarks and monitors the performance of our network on the dimensions of quality, quantity, cost-effectiveness and timeliness.

Quality

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 2017/18 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. A major differentiator of research and education networks is our aim to eliminate packet loss, which is catastrophic for large data transfers typical of our user groups. Packet loss directly effects the quality of the user experience and the integrity of the information transferred.

As such, we set packet delivery targets well beyond the levels of an ordinary telecommunications provider. For 2017/18, we reported an average packet delivery of 99.9999999% across our network backbone. Each additional decimal place has an exponentially positive impact on the capacity for data-intensive work. By comparison, Chorus has a target of 99.90% packet delivery. For our users, a 100-terabyte (TB) dataset takes one day to transfer over a clean, high-performance 10 Gbps connection with no packet loss. If the network suffered only 0.002% packet loss during this transfer (a delivery target of 99.998%, which is well above Chorus' target of 99.90%), it would stretch out to 215 days, making work impossible.

We record and report on packet delivery targets, as it is a key element of network quality and one of the defining features of research and education networks.

	Result June 2017	Target June 2018	Result June 2018
Network availability			
National network availability (12-month rolling average)	99.99%	99.90%	99.99%
International network availability (12-month rolling average)	100%	99.99%	100%
Packet delivery	99.9999998%	99.9999%	99.9999999%

Quantity

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

	Result June 2017	Target June 2018	Result June 2018
Volume			
Network scale and reach (volume of member connections)	+66%	+15%	+6%
Year-on-year growth	1,075 Gbps	1,256 Gbps	1,137 Gbps
Total traffic volume			

Measurements are in petabytes (PB)

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 grew by 62 Gbps (6%) in the last year.

New services added	Result June 2017	Target June 2018	Result June 2018
Service offerings increase	Managed firewall services to members	One new service offering available to members	New Cloud Connect service added

REANNZ planned to launch one new service offering during 2017/18, and succeeded in launching a Cloud Connect service, with Amazon Web Services DirectConnect and Microsoft Azure ExpressRoute currently available as providers. REANNZ is also focused on growing existing services, such as Tuakiri and eduroam.

Cost-effectiveness

In a fledging big-data community, not yet mature in optimising the benefits of international data-intensive collaboration, cost-effectiveness is critical. The cost-effectiveness measure of the REANNZ network is best demonstrated by retaining our core membership base and growing overall membership. If we are not cost-effective in providing valuable networking solutions, or able to obtain funding to support the specialist network services at a level that keeps prices affordable for members, our members will have to make choices about their participation in data-intensive research and REANNZ membership.

REANNZ addresses 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. Not only is our network designed to support time-sensitive and bursty traffic flows globally, but the network has other performance attributes, such as very low packet loss thresholds and low latency and jitter, which commercial networks are not designed to support.

Memberships maintained	Result June 2016	Result June 2017	Target June 2018	Result June 2018
Service offerings increase	8/8 universities 7/7 CRIs 1/1 ATI 12/15 ITPs 1/3 wānanga	8/8 universities 7/7 CRIs 1/1 ATI 12/16 ITPs 1/3 wānanga	8/8 universities 7/7 CRIs 1/1 ATI 12/16 ITPs 1/3 wānanga	5/8 universities 7/7 CRIs 1/1 ATI 8/16 ITPs 1/3 wānanga

REANNZ attracted three new members to the network during 2017/18 (Level Two Holdings Limited, Techion Group Limited and BRANZ), but also lost two members (BEST and NZ Genomics Limited).

Three universities and two ITPs withdrew at the end of the financial year, leading up to the services structure and pricing model review. We are committed to working with stakeholders, through both the MBIE review and REANNZ's own services structure and pricing model review, to ensure the essential data-intensive research services are available to the broadest number of New Zealand's researchers, academics and students.

Our target for 2018/19 is to reattract two of the universities and one other major member, with a stretch target of all three universities rejoining as members.

Timeliness

Survey of responsiveness	Result June 2016	Result June 2017	Target June 2018	Result June 2018
Users consider reported issues to be resolved in a timely manner (based on member survey)	100%	97%	80% ¹	N/A

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 manage 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.

As a result of the current work with members regarding the revised business model, and the MBIE review, REANNZ did not survey its members in 2017/18 on this specific question.

However in the Member Services Consultancy Group (MSCG) Survey in June, 33 out of 57 survey respondents rated "access to REANNZ Network operations" as significantly or critically valued. 14 respondents ranked access as somewhat important and the remaining respondents either did not rank or ranked access as unimportant. This shows higher than average ratings by members who value direct access to our New Zealand based team of highly-skilled Network Engineers. The service survey will resume during 2018/19.

¹ 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.

Actual revenues and expenses /

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

	Actual 2018 \$ 000	Budget 2018 \$ 000
Revenue		
Crown revenue	8,250	8,250
Network revenue	8,011	8,000
Other revenue	5,286	4,926
Total Revenue	21,547	21,176
Expenses		
Amortisation and depreciation	2,202	2,745
Network expenses	10,435	11,699
Operating expenses	3,781	4,821
Total Expenditure	16,418	19,265
Surplus/(deficit) before foreign currency gains/(losses)	5,129	1,911
Foreign currency gains/(losses)	1,522	-
Surplus/(deficit)	6,651	1,911

FINANCIAL STATEMENTS /

Research and Education Advanced Network New Zealand Limited

Statement of Comprehensive Revenue and Expense for the year ended 30 June 2018

	Note	Actual 2018 \$ 000	Budget 2018 \$ 000	Actual 2017 \$ 000
Revenue				
Grant revenue				
Strategic Science Investment Fund	2	3,000	3,000	-
Hawaiki contribution	2	5,250	5,250	5,250
Crown funding agreement		-	-	4,000
Network revenue		8,011	8,000	7,855
Other revenue	2	4,534	4,362	3,953
Interest revenue		752	564	770
Total Revenue		21,547	21,176	21,828
Network Expenses				
Depreciation and amortisation		2,000	2,421	1,796
Employment expenses		2,303	2,423	1,486
Network operating expenses	3	8,132	9,276	6,649
Total Network Expenses		12,435	14,120	9,931
Gross Surplus / (Loss)		9,112	7,056	11,897
Less:				
Operating Expenses				
Audit		33	33	32
Depreciation and amortisation		202	324	177
Directors fees	4	126	122	123
Employment expenses		2,222	2,219	2,335
Other operating expenses		731	1,337	1,002
Professional services		207	454	335
Operating leases		213	256	184
Travel expenses		249	400	250
Total Operating Expenses		3,983	5,145	4,438
Surplus / (Deficit) excluding gains		5,129	1,911	7,459
Foreign currency gains / (losses)	5	1,522	-	(788)
Surplus / (Deficit)		6,651	1,911	6,671
Other comprehensive revenue		-	-	-
Total Comprehensive Revenue and Expense		6,651	1,911	6,671

Explanations of major variances to budget are provided in note 25.

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 2018

	Notes	Actual 2018 \$ 000	Budget 2018 \$ 000	Actual 2017 \$ 000
Assets				
Current Assets				
Cash and cash equivalents	6	5,187	4,300	3,094
Funds held in escrow	7	4,029	3,774	10,009
Receivables and debtors	8	3,546	3,051	3,897
GST receivable		92	(141)	(33)
Investments	9	19,092	11,300	20,479
Derivative financial instruments	10	459	531	154
Prepayments		442	115	647
Prepaid network expenses	11	939	1,290	388
Total Current Assets		33,786	24,220	38,635
Current Liabilities				
Accounts payable and accrued expenses	14	1,689	1,988	1,717
Employee entitlements	15	249	144	239
Revenue in advance	16	2,248	2,906	2,660
Deferred revenue	17	3,165	3,000	5,310
Deferred lease incentive		17	17	17
Total Current Liabilities		7,368	8,055	9,943
NET CURRENT ASSETS		26,418	16,165	28,692
Non-current assets				
Property, plant and equipment	12	13,081	16,436	12,943
Intangibles	13	7	-	9
Derivative financial instruments	10	79	121	117
Prepaid network expenses	11	14,742	17,634	8,982
Total non-current assets		27,909	34,191	22,051
Non-Current Liabilities				
Deferred revenue	17	-	-	3,050
Deferred lease incentive		47	47	64
Total Non-Current Liabilities		47	47	3,114
NET ASSETS		54,280	50,309	47,629
EQUITY				
Share capital		16,001	16,001	16,001
Accumulated surplus		38,279	34,308	31,628
Total Equity		54,280	50,309	47,629

Explanations of major variances to budget are provided in note 25.

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 2018**

	Actual 2018 \$ 000	Budget 2018 \$ 000	Actual 2017 \$ 000
CASH FLOWS FROM OPERATING ACTIVITIES			
Cash was provided from (applied to)			
Receipts from the Crown	3,000	3,000	4,000
Network revenue	7,816	8,242	7,717
Interest revenue	766	564	731
Other revenue	4,684	4,057	3,672
GST (net)	(110)	907	(71)
Payments to suppliers and employees	(13,258)	(15,040)	(12,354)
Prepayment for network connectivity	(6,699)	(9,943)	(6,448)
Realised gain on foreign currency	424	-	348
Net cash flow from operating activities	(3,377)	(8,213)	(2,405)
CASH FLOWS FROM INVESTING ACTIVITIES			
Cash was provided from (applied to)			
Purchase of plant and equipment	(2,529)	(6,939)	(1,814)
Funds transferred from escrow	6,699	6,604	6,448
Term deposit investments	1,300	9,000	(2,278)
Net cash flow from investing activities	5,470	8,665	2,356
CASH FLOWS FROM FINANCING ACTIVITIES			
Cash was provided from (applied to)			
Net cash flow from financing activities	-	-	-
Net (decrease)/increase in cash held	2,093	452	(49)
Cash at beginning of year	3,094	3,848	3,143
Cash at end of year	5,187	4,300	3,094
Represented by			
CASH AT BANK	5,187	4,300	3,094

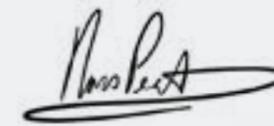
Explanations of major variances to budget are provided in note 25.
The accompanying notes form part of these financial statements.

Research and Education Advanced Network New Zealand Limited

**Statement of Changes in Equity
for the year ended 30 June 2018**

	Notes	Actual 2018 \$ 000	Budget 2018 \$ 000	Actual 2017 \$ 000
Balance at 1 July		47,629	48,398	40,958
Total comprehensive revenue and expense for the year		6,651	1,911	6,671
Equity at end of year	18	54,280	50,309	47,629

Signed on behalf of the Board:



Ross Peat
Acting Chair
17 October 2018



Steve Weaver
Director
17 October 2018

Explanations of major variances to budget are provided in note 25.
The accompanying notes form part of these financial statements.

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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 2018 and were approved by the Board on 17 October 2018.

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).

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' – those activities relating to the acquisition and disposal of long-term assets and other investments not included in cash equivalents.
- › Financing activities' – 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 2017/18 Statement of Performance Expectations dated 30 June 2017 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 12.

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

	2018 \$ 000	2017 \$ 000
Non-exchange transactions		
Ministry of Business, Innovation and Employment Strategic Science Investment Fund contract	3,000	-
Ministry of Business, Innovation and Employment Crown funding agreement – Hawaiki Cable Managed Capacity	5,250	5,250
Ministry of Business, Innovation and Employment Crown funding agreement (ceased 30 June 2017)	-	4,000
Total grant revenue	8,250	9,250

REANNZ and the Ministry of Business, Innovation and Employment ('MBIE') entered into a SSIF Infrastructure Platform Investment contract during the 2017/18 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 \$5.25M was recognised this financial year, in line with the third 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

	2018 \$ 000	2017 \$ 000
Exchange transactions		
Managed services	2,471	2,072
Internet	1,585	1,449
Other	478	432
Total other revenue	4,534	3,953

iii. Gross telecommunications services revenue

In accordance with the information disclosure requirements under Section 83 of the *Telecommunications Act 2001*, gross telecommunications revenue for the year ended 30 June 2018 was \$12.48M (2017: \$11.78M). Revenue from grants, interest and other non-telecommunications services of \$9.07M (2017: \$10.05M) were excluded. Allowable deductions for payments to other telecommunications service providers of \$2.68M (2017: \$2.45M) were made.

3. Network operating expenses

	2018 \$ 000	2017 \$ 000
National network		
Fibre circuits	1,673	1,368
Other network expenses	1,438	1,345
PoP accommodation	349	382
Connectivity	21	21
Asset disposals	-	2
Total national network expenses	3,481	3,118
International network		
International connectivity	4,544	3,426
Other network expenses	72	105
PoP accommodation	33	-
Fibre circuits	2	-
Total international network expenses	4,651	3,531
Total network operating expenses	8,132	6,649

Network expenses include \$325K relating to operating lease expenses recognised during the year (2017: \$309K).

4. Directors' fees

	2018 \$ 000	2017 \$ 000
The total value of remuneration paid or payable to each Board member during the year was:		
J Donovan (Chair)*	41	39
R Peat (Deputy Chair)	25	24
S Hall*	20	20
S Johnstone*	20	20
S Weaver	20	20
Total directors' fees	126	123

*tenure ended on 30 June 2018

Following the 30 June 2018 end of tenures, Ross Peat was appointed Acting Chair until March 2019.

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 (2017: \$Nil).

5. Foreign currency gains/(losses)

	2018 \$ 000	2017 \$ 000
Realised foreign currency gains/(losses)	424	348
Unrealised foreign currency gains/(losses)		
Escrow account (USD)	646	(323)
Fair value gains on derivatives	267	(793)
Bank account (USD)	185	(20)
Total foreign currency gains/(losses)	1,522	(788)

In July 2014, NZ\$15M was deposited into a USD denominated escrow account as the initial fee for a 25-year lease of managed capacity with the Hawaiki Submarine Cable Limited Partnership. The contract came into force in March 2016. Three out of the four milestone payments have been made (US\$10.57M). At year-end, the balance was US\$2.73M. The escrow account incurred unrealised gains resulting from the net movement in the NZD against the USD for the year. Net unrealised gains were made on forward USD contracts held with the New Zealand Debt Management Office (NZDMO), reflecting the increase in the fair value of the contracts for the year. The realised gains largely reflect the gain on trades that settled during the year.

As at 30 June 2018, REANNZ held six forward contracts (2017: nine contracts) to purchase a total of US\$4.10M (2017: US\$6.12M). One contract is settled each quarter until July 2019. The contracts were entered into to mitigate foreign exchange exposure arising from quarterly network payments contractually required to be paid in USD.

6. Cash and cash equivalents

	2018 \$ 000	2017 \$ 000
Cash at bank and on hand	5,187	3,094
Total cash and cash equivalents	5,187	3,094

The total above includes NZ\$3.45M held in USD (2017: NZ\$116K).

7. Funds held in escrow

	2018 \$ 000	2017 \$ 000
NZD equivalent of funds held USD escrow account	4,029	10,009
Total funds held in escrow	4,029	10,009

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 NZ\$15M (US\$13.21M) was deposited into a USD denominated escrow account, as required by the contract whereby all obligations are in USD. Three out of the four milestone payments, totalling US\$10.57M, have been made. The account incurred unrealised foreign exchange gains of NZ\$646K during the year.

8. Receivables and debtors

Accounting Policy

Accounts receivable are recognised at fair value. A provision for impairment of accounts receivable is made where there is objective evidence that REANNZ will not collect all amounts due according to the original terms of the receivable. When this occurs, the receivable is recorded at amortised cost, less provision for impairment. When the receivable is uncollectible, it is expensed in the Statement of Comprehensive Revenue and Expense.

Breakdown of receivables and debtors	2018 \$ 000	2017 \$ 000
Exchange transactions		
Trade receivables	2,643	2,841
Less: provision for uncollectibility	(19)	-
Total receivables	2,624	2,841
Forward USD contract receivable	907	884
Sundry debtors	15	172
Total receivables and debtors	3,546	3,897

Movements in the uncollectibility of receivables are as follows:

	2018 \$ 000	2017 \$ 000
Balance as at 1 July	-	-
Additional provisions made during the year	19	-
Receivables written off during the year	-	-
Balance at 30 June	19	-

In line with member contracts, membership fees are due quarterly in advance. Of the total receivables and debtors above, \$2.07M including GST (2017: \$2.51M including GST) relates to membership fees and services to be provided by REANNZ during the coming financial year. These fees are shown as income received in advance until the service period begins, at which time the fees are recognised as revenue in the Statement of Comprehensive Revenue and Expense.

The carrying value of debtors and other receivables approximates their fair value.

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

9. 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.

Breakdown of investments	2018 \$ 000	2017 \$ 000
Term deposits (maturity three months or less)	19,092	20,479
Total investments	19,092	20,479

There is no impairment provision for investments.

10. 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 remeasured 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 2018, the fair value of derivative financial instrument assets was \$538K (2017: \$271K). Of this amount, \$459K relates to USD forward contracts due to be settled within 12 months, with the remaining amount to be settled in July 2019.

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.

11. 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.

	2018 \$ 000	2017 \$ 000
Balance at beginning of year	9,370	3,310
Prepayment expensed during year	(388)	(388)
Payments made during the year	6,699	6,448
Net book value	15,681	9,370
Current/non-current split		
Current	939	388
Non-current	14,742	8,982
Total prepaid network expenses	15,681	9,370

A prepayment of US\$4.62M was made in October 2017 to the Hawaiki Submarine Cable Limited Partnership for the third milestone of 35% of the initial fee (total US\$13.21M), as required under the 25-year lease for managed capacity.

The contract required four milestone payments in USD, with the final payment made in August 2018 when REANNZ accepted the Required Lease Capacity. Crown funding for the milestone payments of NZ\$15M was received in June 2014 (see note 2) and was deposited into a USD denominated escrow account (US\$13.21M).

The prepayment made in October 2017 of US\$4.62M converted to NZ\$6.70M compared to NZ\$5.25M on the escrow deposit date. The \$1.45M foreign exchange loss increased the cost of the prepayment in NZD and is to be amortised over the 25-year lease period from the date REANNZ accepted the Required Lease Capacity on 10 August 2018.

12. 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 equipment, at cost less accumulated depreciation and impairment losses, and
- › 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 revalued, 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 Revenue 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	Work in progress \$'000	Total \$'000
Cost or valuation									
Balance at 1 July 2016	96	541	9,695	123	381	46	8,202	37	19,121
Balance at 30 June 2017	108	645	11,004	103	381	46	8,202	-	20,489
Additions	24	107	1,912	925	-	-	8	-	2,978
Sales/write offs	-	(31)	(1,860)	-	-	(9)	-	-	(1,900)
Balance at 30 June 2018	132	721	11,056	1,028	381	37	8,210	-	21,565
Accumulated depreciation									
Balance at 1 July 2016	73	343	4,301	111	12	34	1,179	-	6,053
Balance at 30 June 2017	74	415	5,251	103	75	39	1,589	-	7,546
Depreciation expense	13	126	1,537	48	63	5	410	-	2,202
Disposals	-	(30)	(1,225)	-	-	(9)	-	-	(1,264)
Balance at 30 June 2018	87	511	5,563	151	138	35	1,999	-	8,484
Carrying amounts									
Balance at 1 July 2016	23	198	5,394	12	369	12	7,023	37	13,068
Balance at 30 June 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	-	13,801

The net carrying amount of fibre held under finance leases is \$1.69M (2017: \$1.79M) – also refer to note 19.

13. 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 12. 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 2016	-	49	49
Balance at 30 June 2017	9	49	58
Additions	-	2	2
Disposals	-	-	-
Balance at 30 June 2018	9	51	60
Accumulated amortisation			
Balance at 1 July 2016	-	49	49
Balance at 30 June 2017	-	49	49
Amortisation expense	3	1	4
Disposals	-	-	-
Impairment losses	-	-	-
Balance at 30 June 2018	3	50	53
Carrying amounts			
At 1 July 2016	-	-	-
At 30 June 2017	9	-	9
At 30 June 2018	6	1	7

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

14. Accounts payable and accrued expenses

Accounting Policy

Short-term payables are recorded at the amount payable.

Breakdown of payables and accrued expenses	2018 \$'000	2017 \$'000
Exchange transactions		
Creditors	1,462	1,564
Accrued expenses	227	153
Total accounts payable and accrued expenses	1,689	1,717

15. 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, and 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	2018 \$'000	2017 \$'000
Accrued salaries and wages	32	67
Annual leave	217	172
Total employee entitlements	249	239

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

16. Revenue in advance

Exchange transactions	2018 \$'000	2017 \$'000
Fees received in advance	452	480
Fees invoiced but not yet received	1,796	2,180
Total revenue in advance	2,248	2,660

Revenue in advance includes membership fees billed quarterly 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.

17. Deferred revenue

	2018 \$ 000	2017 \$ 000
Current portion		
<u>Non-exchange transactions</u>		
Ministry of Business, Innovation and Employment Crown funding – Hawaiki Cable Managed Capacity (see note 2)	3,000	5,250
<u>Exchange transactions</u>		
Other prepayments for services	165	60
Total current portion	3,165	5,310
Non-current portion		
<u>Non-exchange transactions</u>		
Ministry of Business, Innovation and Employment Crown funding – Hawaiki Cable Managed Capacity	-	3,000
<u>Exchange transactions</u>		
Other prepayments for services	-	50
Total non-current portion	-	3,050
Total deferred revenue	3,165	8,360

REANNZ received a \$15M grant from MBIE in June 2014 to enter into a 25-year lease of managed capacity with the Hawaiki Submarine Cable Limited Partnership. The grant is recognised as revenue when contractual milestones are met, and liabilities fall due. The third milestone payment of 35% was made in October 2017. Accordingly, \$5.25M of the grant was recognised as revenue. The remaining \$3M grant will be recognised as revenue during the next financial year.

18. 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 2018, share capital comprised 1,816 ordinary shares (2017: 1,816). All issued shares are fully paid and have no par value.

	2018 \$ 000	2017 \$ 000
Breakdown of equity		
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	31,628	24,957
Surplus/(deficit) for the year	6,651	6,671
Balance at 30 June	38,279	31,628
Total equity	54,280	47,629

19. 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 Revenue 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:

	2018 \$ 000	2017 \$ 000
Less than one year	581	473
Between one and two years	407	391
Between two and five years	550	584
Later than five years	-	-
Total operating lease commitments	1,538	1,448

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.

	2018 \$ 000	2017 \$ 000
Less than one year	7,904	5,369
Between one and two years	3,226	7,154
Between two and five years	7,216	7,122
Later than five years	46,983	46,346
Total connectivity and managed service commitments	65,329	65,991

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 of the lease is \$15M, paid in USD by instalments. The final payment was made in August 2018. REANNZ recognises the upfront cost of the lease over the term of the contract, commencing when REANNZ accepted the Required Lease Capacity on 10 August 2018.

Following acceptance, REANNZ will incur annual 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 \$1.69M (2017: \$1.79M).

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.

20. Contingencies

There were no contingent assets or liabilities at balance date for which disclosure is required (2017: \$Nil).

21. 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.

There were no related party transactions during 2017/18 that required disclosure.

Key management personnel compensation

The compensation of the Board of Directors and the Chief Executive Officer and senior management (the Leadership Team), being the key management personnel of REANNZ, is set out below:

	2018 \$ 000	2017 \$ 000
Directors		
Remuneration	126	123
Full-time equivalent members	1.46	1.47
Leadership Team		
Remuneration	1,121	1,073
Full-time equivalent members	4.89	4.39
Total key management personnel remuneration	1,247	1,196
Total full-time equivalent personnel	6.35	5.86

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 and attendance at external stakeholder meetings.

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

22. Employee remuneration

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

	2018 Employees	2017 Employees
\$100,000–\$109,999	3	2
\$110,000–\$119,999	2	2
\$120,000–\$129,999	-	1
\$130,000–\$139,999	3	3
\$140,000–\$149,999	1	3
\$150,000–\$159,999	-	1
\$160,000–\$169,999	3	2
\$170,000–\$179,999	1	-
\$180,000–\$189,999	2	-
\$230,000–\$239,999	1	-
\$290,000–\$299,999	-	1
\$330,000–\$339,999	1	-

During the year ended 30 June 2018, REANNZ paid \$44K compensation and other benefits in relation to cessation to three employees (2017: \$69K to one employee).

23. Events after balance date

Core membership contracts that ended on 30 June 2018 were extended until 31 December 2018 while REANNZ works with members on a new pricing model.

24. Financial instruments

Financial instrument categories

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

	2018 \$ 000	2017 \$ 000
Fair value through surplus or deficit – held for trading		
Derivative financial instrument assets	538	271
Financial liabilities measured at amortised cost		
Accounts payable and accrued expenses (excluding income in advance, taxes payable and grants received subject to conditions)	1,689	1,717
Finance leases	1,691	1,790
Total financial liabilities measured at amortised cost	3,380	3,507
Loans and receivables		
Cash and cash equivalents	5,187	3,094
Funds held in escrow	4,029	10,009
Debtors and other receivables	3,546	3,897
Investments – term deposits	19,092	20,479
Total loans and receivables	31,854	37,479

25. Explanation of major variances to budget

Statement of Comprehensive Revenue and Expense

Revenue

Membership fees and grant revenue were in line with budget. The continued growth of the services revenue stream and interest revenue contributed to total revenue exceeding budget for the year. Interest revenue was higher than anticipated from higher levels of cash reserves during the year, due to careful management of expenses, prudent investment evaluations and some deferral of capital expenditure to maximise useful lives and minimise investment commitment. These decisions were partly driven by REANNZ's desire to provide value-for-money to its members, but also to secure stronger levels of cash reserves until REANNZ future funding is more certain.

Network expenses

Network expenses were lower than budget from sustained rigour in procurement processes and network traffic monitoring but also a more favourable USD than budget, all of which resulted in overall savings compared to budget.

- > Careful traffic management enabled savings from the deferral of the planned international network bandwidth capacity upgrades.
- > Careful investment evaluations enabled lower cost of initial investment and depreciation from deferred or permanent capital expenditure savings in relation to the new international cable and national network capacity upgrades.
- > Efficient procurement meant lower levels of third-party contractors (partly offset from internal personnel costs), and other procurement savings.

There were also timing differences (to budgets) with delays in completion of major initiative work (compared to budget) and more favourable USD exchange rates, which also impacted on lower operational costs.

Operating expenses

Overall operating expenses were under budget for the year from prudent monitoring and planning. External consultant use was minimised as projects were able to be completed internally. Legal fees associated with the new international cable were not to the level expected. There were timing differences from open roles in the Member Engagement team for most of the year, and the delays in filling the roles also caused lower levels of communications and events expenditure. All open positions are now filled.

The establishment of an office in Auckland was delayed and setup costs were lower than budget, which resulted in operational savings in rent and depreciation for the year.

Other personnel costs were in line with budget and lower than prior year.

Foreign currency gains/(losses)

Unrealised exchange gains of \$1.1M consist of foreign exchange gains on USD denominated bank accounts plus fair value gains on derivative financial instruments at balance date. Most of the realised gains of \$424K materialised on settlement of forward foreign currency trades.

Statement of Financial Position

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

The investment of the international connectivity upgrade, required as part of the new international cable, will be incurred over time as an operational service and not as capital expenditure and prepaid expenses as budgeted. This saved \$4.5M budgeted cash reserves from capital equipment \$1.18M and \$3.34M prepaid network expenses. The decision also enables flexibility to negotiate future cost savings.

Other capital expenditure budget savings were made:

- › \$200K in leasehold improvements to our Auckland offices not required,
- › Timing differences in asset purchases for the national network capacity upgrade, and
- › Network equipment generally paid for in USD (cost savings were made from more favourable lower actual USD exchange rates compared to budget).

Accounts receivable was lower than budget. Revenue billed in advance for quarterly membership fees was reduced because some less research-intensive members opted not to extend their membership to the REANNZ network from 1 July 2018.

Statement of Cash Flows

Operating cash flows

Outstanding membership fees for the quarter ending 30 June 2018 of \$374K caused the variance in network revenue.

Operational savings from the network and operating expenditure resulted in cash payment savings of \$1.6M to suppliers and employees.

Actual prepaid network expenses were \$3.34M lower than budgeted because of the decision to acquire the international capacity upgrade as a service, and not as a 25-year prepaid commitment.

Investing cash flows

The lower levels of cash required for capital expenditure investments (from permanent savings, deferral of capital expenditure to operating services, and a more favourable USD exchange rate), meant less need to draw down investment funds held on interest bearing term deposit investments.

REANNZ members as at 1 July 2018

Universities



Crown Research Institutes



Institutes or Technology and Polytechnics



Wānanga



Education



Research



*retained membership until 31 July 2018

REANNZ