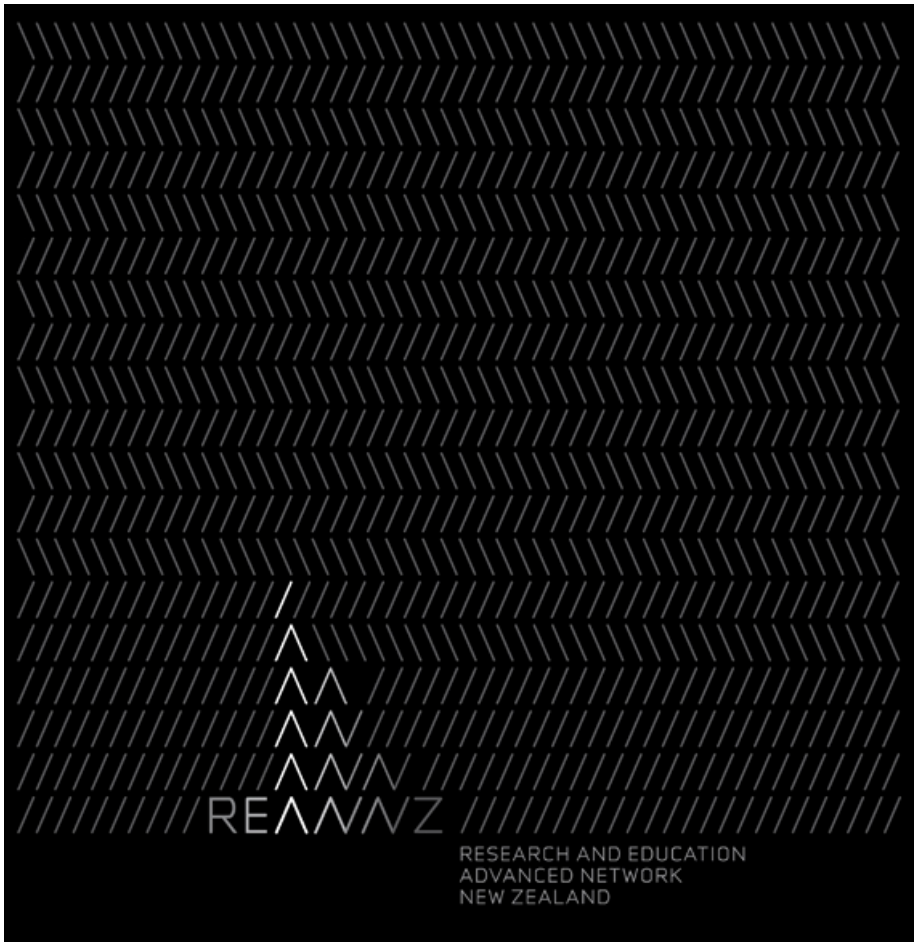
REANNZ

RESEARCH AND EDUCATION
ADVANCED NETWORK
NEW ZEALAND

Research and Education Advanced Network New Zealand Limited Statement of Intent

2012 – 2015

May 2012



REANNZ

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1. Introduction

This Statement of Intent is submitted by the Board of Directors of Research and Education Advanced Network New Zealand Limited (REANNZ), pursuant to the Crown Entities Act 2004. It sets out the strategic direction for REANNZ for the period 1 July 2012 to 30 June 2015.

Statement of responsibility

REANNZ's Board is responsible for the prospective financial statements and statement of forecast service performance contained in this document, including the appropriateness of the assumptions underlying them. It is also responsible for internal control systems, which provide reasonable assurance as to the integrity and reliability of financial reporting.

Prof. John Raine	Prof. George Benwell
Chair	Deputy Chair

17 May 2012

2. About REANNZ

Who are we?

REANNZ is a Crown Owned Company that procures, operates and maintains the infrastructure and support services that allow New Zealand's researchers, scientists and educators to collaborate with their peers around the world via instantaneous and unlimited access to any resource for knowledge creation, innovation and learning.

Today's science is becoming increasingly distributed and data-intensive. Those researchers that can collect, sort, mine and analyse data quickly and effectively will be generating the new inventions in areas like healthcare, education and manufacturing that will power New Zealand's future economy. REANNZ provides the network platform that allows researchers, scientists and educators to innovate by removing the barriers to data mobility that are inhibiting the creation of these disruptive new technologies. With access to large data transfer capabilities and network tools that encourage multi-institutional collaboration, our scientists will have access to the world's unique science facilities and more effective and efficient ways of working.

By providing this network platform, REANNZ aims to create a landscape without barriers to the exchange and development of ideas and knowledge, and where a high performing research, education and innovation sector contributes to improving New Zealand's wealth and wellbeing.

Why do we need a specialised R,E & I network?

Large-scale science and data-intensive disciplines need networks optimised for very different traffic patterns than the commercial Internet. Commercial networks see many millions of small, short duration flows that, when aggregated, produce smooth and easy to predict diurnal traffic patterns. Research networks' traffic mix is dominated by bursty, high-throughput, multi-terabit flows that may last for days. This requires the provisioning of capacity beyond what is typically cost effective for commercial networks. For research networks to facilitate

science, there needs to be enough space for traffic to burst and allow these large flows through, but this space is not fully utilised all of the time.

Science disciplines require different network technology than an ordinary Internet user. Time sensitive science data requires the network to be optimised for minimal latency, large data sets need guaranteed end-to-end performance, (from the scientist to their, often international, end host destination), and compatibility between different networks and end users. These specialist requirements are on a scale that commercial networks simply cannot cost-effectively provide.

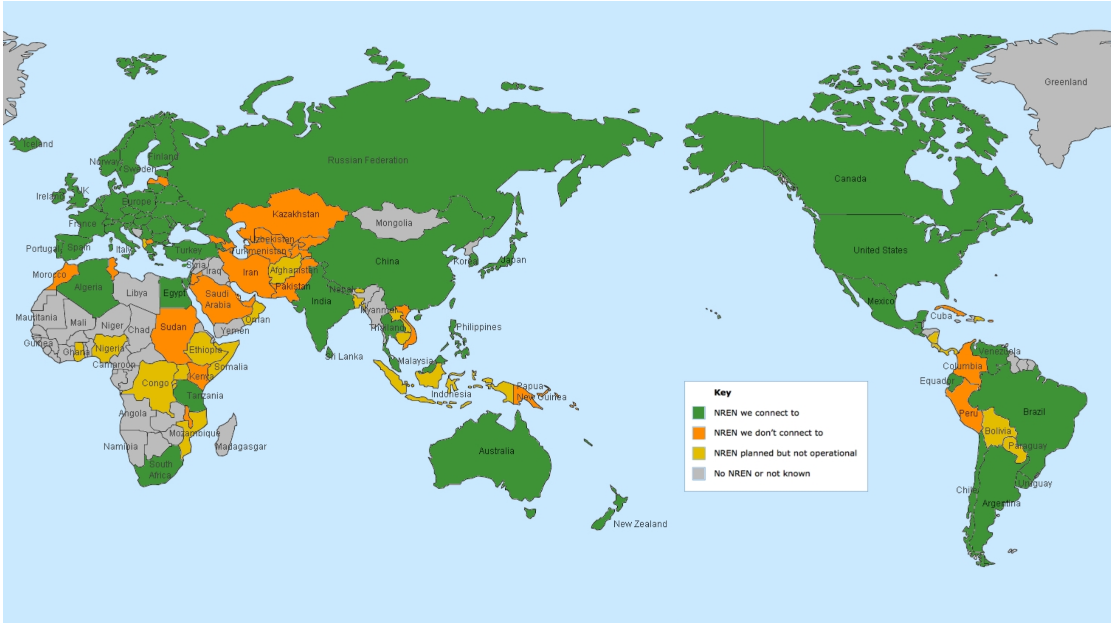
In this sense, REANNZ exists to address a niche market that commercial networks don't meet - the provisioning of the unique services that meet science, research and education needs.

In addition to this, the nature of science activity has changed dramatically in recent years due to the increasing availability of optical fibre networks. These fibre-based networks have enabled science to become increasingly distributed, with remote access to instruments, wider collaboration on projects between institutions and countries, and the sharing of massive datasets between multiple users for different research purposes. Gone are the days where scientists conducted ground breaking research by toiling away in isolation in their labs.

Purpose-built network platforms like the one REANNZ provides to its community are oxygen for data-intensive science and advanced applications and are proving to be essential in the recruitment and retention of world-class talent.

Who do we support?

Networks are the common infrastructure that binds communities. At REANNZ, we form part of the research, education and innovation ecosystem, connecting participants in those sectors to each other and the world. Nearly all developed countries, and many developing countries, have a research network similar to REANNZ.



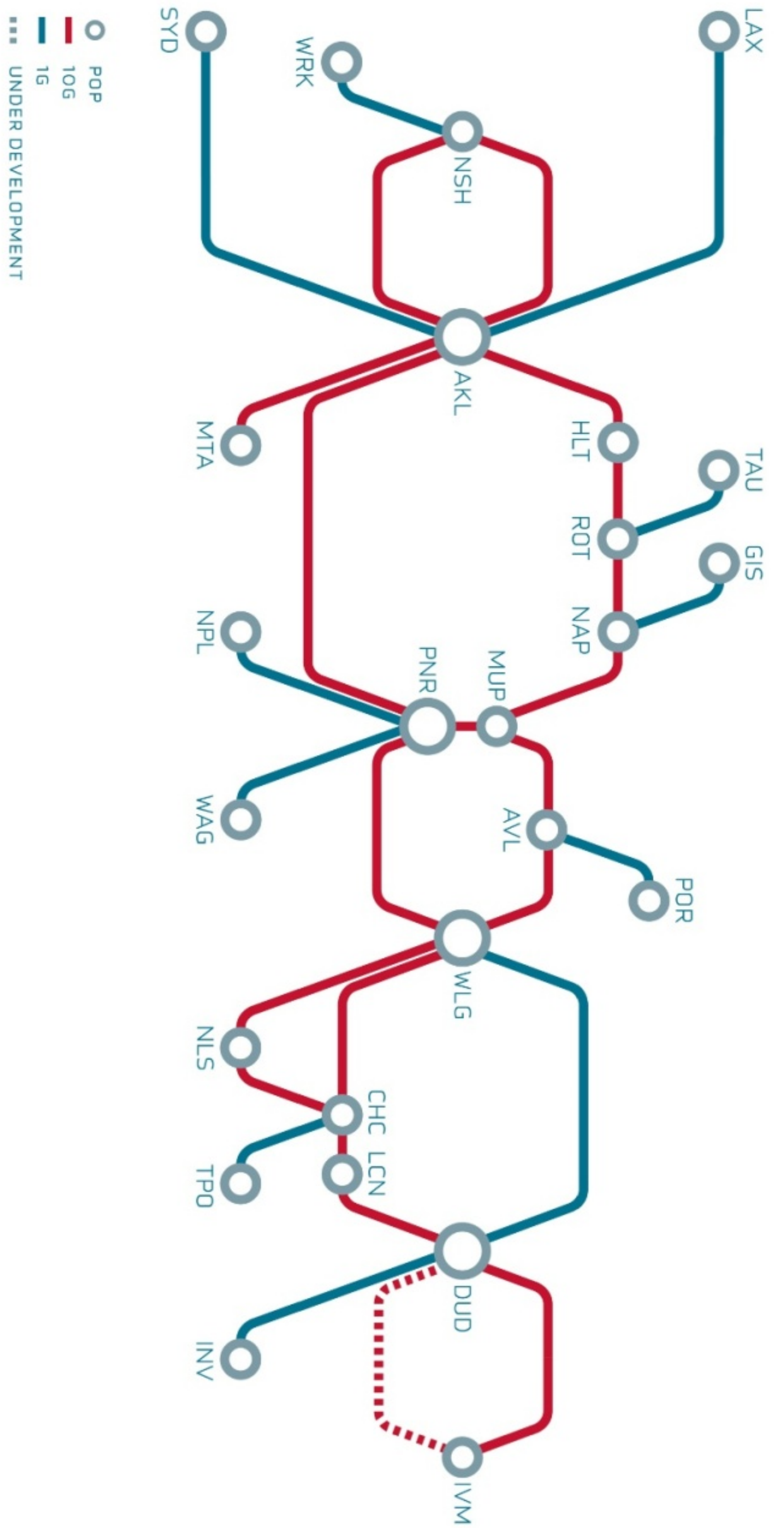
REANNZ is a membership organisation, funded by a mix of Crown contributions and Member revenues. From July 2013, an agreed sustainable funding model will be realised, with 67% of revenues obtained from member fees and the remaining 33% funded by Crown operating contributions.

REANNZ's core members are the New Zealand Universities and Crown Research Institutes, with Polytechs, Institutes of Technology and Wananga making up the remainder of the tertiary education membership base. We are also increasingly supporting the free flow of knowledge from the tertiary to the secondary education sector, having connected more than 126 schools across New Zealand.

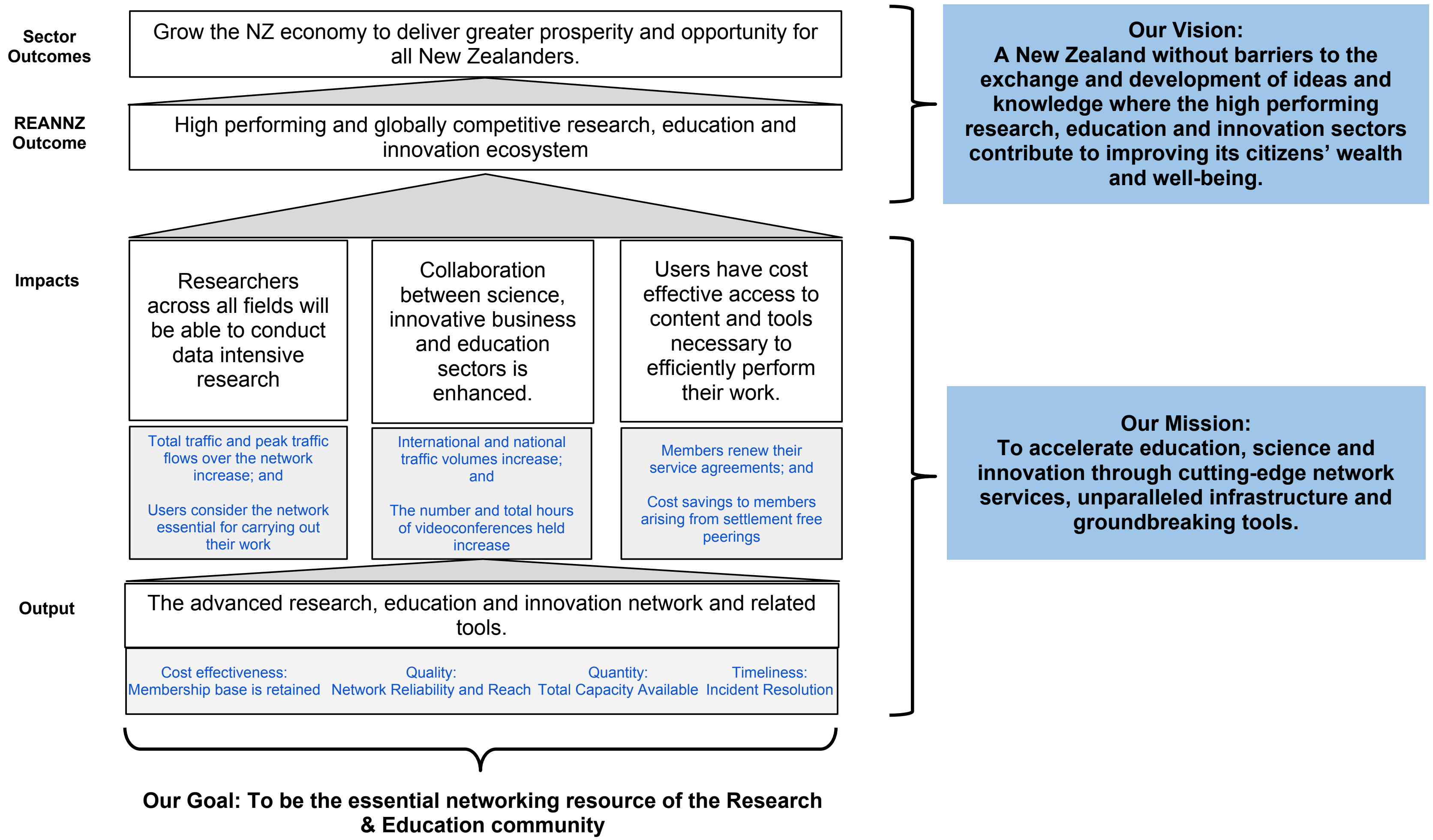
In order to help facilitate our mission, REANNZ also connects organisations that provide services of benefit to our membership base, such as e-learning content providers. This both decreases the cost to members of accessing relevant content by delivering it across our network instead of over commercial carriers, and improves the quality of their user experience by ensuring it is accessible at faster network speeds.

Additionally, REANNZ connects innovative businesses to the network, allowing them to work directly with the science and research institutions that are assisting them with product development or commercialisation.

The REANNZ network's national footprint is shown below:



3. How does REANNZ contribute?



3. What are we seeking to achieve?

Government and Sector Outcomes

A clear goal for Government is to grow the New Zealand economy. Recognising that modern economies are built upon the free exchange of ideas, a key pillar of this strategy is to stimulate economic growth through increased research, collaboration, and innovation.

The Ministry of Science and Innovation, soon to become part of the Ministry of Business, Innovation and Employment, is a key driver of these policies, aiming to double the value from science and innovation for New Zealand within the next five years.

"Innovation is underpinned by scientific research capacity and skills that create and absorb new knowledge, technology and expertise. Flourishing innovation requires not only scientific discovery and invention, but successful commercial application".[1]

REANNZ provides the network platform that supports the scientific research capacity and skills that are required for innovation to flourish.

1 Ministry of Science and Innovation, Briefing for the incoming minister 2011

REANNZ Outcomes

REANNZ is one of many contributors to a high performing research, education and innovation ecosystem. The scale and diversity of the REANNZ member community (over 175 institutions are connected, serving hundreds of scientists, researchers and educators) makes it difficult to isolate REANNZ's direct contribution to this ecosystem. However, the goal for all participants is to lift performance across the board, with particular emphasis on lifting the performance of the innovation system, which turns ideas and knowledge into value.

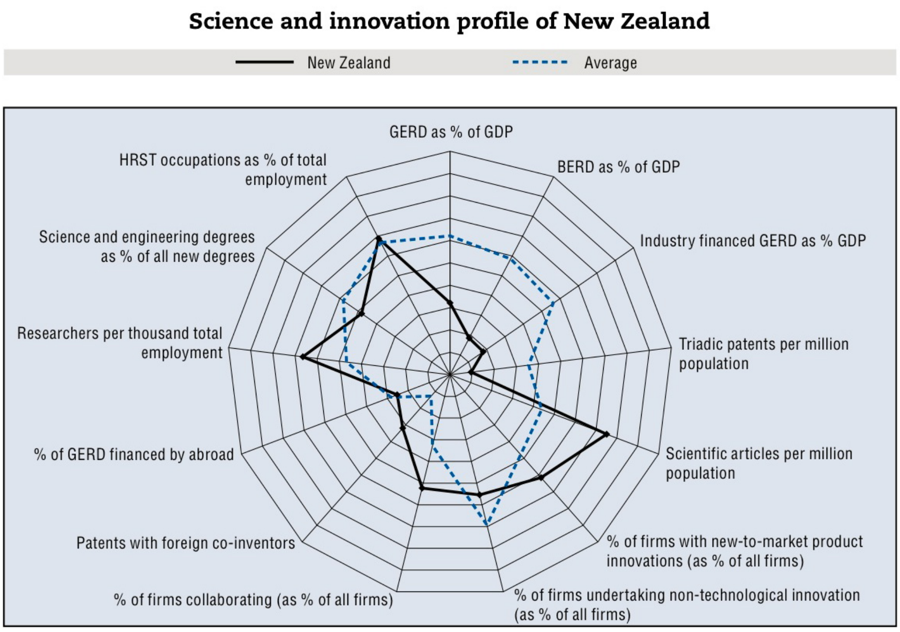


Fig 1 – OECD Science, Technology and Industry Outlook 2010

Tracking the performance of New Zealand's science and innovation ecosystem as a whole is an indirect indicator of the achievement of REANNZ's outcomes. The diagram above shows that the science system is generally well performing, although private sector research and development is low compared with the OECD average. Scientific articles per million, patents with foreign co-investors and researchers in employment are all above the OECD average, despite the comparatively low amounts of investment in research and development. By increasing its industry membership REANNZ may help lift industry investment in R&D by enabling high speed data connections with the research community.

The wider, more direct outcomes of REANNZ's services are, by nature, generated through the outputs of the researchers who use our infrastructure. It is their use of our services, amongst other things, that will help lift the performance of the New Zealand research and development ecosystem on measures as indicated by Figure 1.

4. What does success look like for our users?

If REANNZ is successful in delivering a quality research, education and innovation network platform, we will have the following impact on our users:

Researchers across all fields will be 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 NeSI (National eScience Infrastructure), NZGL (New Zealand Genomics Limited which performs genome sequencing), and radio astronomy. All of these projects involve instrumentation that generates massive datasets. These datasets need to be transported quickly and accurately from the instruments to hosting or processing centres, and to the scientists performing the research.

The international connectivity REANNZ provides also reduces the negative impact our geographic remoteness has on our ability to participate in global science collaborations, creating opportunities for New Zealanders to participate in large-scale science initiatives.

This plays a key role in being able to attract overseas talent to New Zealand, and for New Zealand to be competitive on the world stage.

Indicators that data intensive science can be performed are based on the amount of data flowing over the network, as well as our users' own assessment of the need for the network.

Able to Conduct Data Intensive Science & Research	**Actual 2010/11**	**Estimate 2011/12**	**Forecast 2012/13**	**Forecast 2013/15**
Total Traffic Flows increase	n/a	40 PB[2]	56 PB	+ 40% p.a
Increases in the total amount of traffic flowing over the network indicate more science is being conducted. This suggests REANNZ is enabling more and more scientific applications.				

[2] PetaBytes (PB), see glossary

Able to Conduct Data Intensive Science & Research	Actual 2010/11	Estimate 2011/12	Forecast 2012/13	Forecast 2013/15
Peak Traffic Flows increase	2.7 Gb/s[3]	3.7 Gb/s	4.5 Gb/s	+ 20% p.a
Increases in the peak traffic flows indicate that activities with larger data transfer needs are being conducted, as more data is being shifted at one time. There is potential for the growth of peak traffic to be effected as users reach the limits of their campus infrastructure.				
Users consider the REANNZ network essential to their work	69%	70%	75%	Improvement on prior year
This indicator suggests users could not perform their work without the network platform REANNZ provides.				

Collaboration between science, innovative business and education sectors is enhanced

As mentioned before, advanced networks provide a platform on which collaboration can take place. They provide connectivity that allows collaboration between institutions, between sectors and between countries. This collaboration drives the development of new ideas and leads to breakthrough science; the building blocks of an innovation led economy.

Researchers now partner in virtual collaborations spanning time zones and continents; local laboratories have become global user facilities generating petabytes of data. This system is supported by advanced networks and computing resources. Large scientific instruments are routinely generating thousands of terabytes of data on a daily basis that need to be shared and analysed by researchers located at many sites around the world.

Collaboration takes many forms, it can be a simple as having a conversation over videoconference, or as complex as the multistep process of turning one scientist's research project into a commercial product. REANNZ can help these collaborations take place, by providing connectivity and the tools to make collaboration easier and more effective.

[3] Gigabits per second, see glossary

The following indicators are indirect measures of the collaboration enabled by REANNZ. Traffic volume through the international network is an indirect measure of the international collaboration enabled by the network platform. The amount of videoconferencing taking place is an indicator of the most basic and direct form of collaboration that could occur as a result of REANNZ’s network; a multi participant videoconference.

Enhanced Collaboration	**Estimate 2011/12**	**Forecast 2012/13**	**Forecast 2013/15**
Traffic volume through international network	.87 PB	.96 PB	> 1 PB
Traffic volume through the national network	39.13 PB	55.04 PB	+ 40% p.a
International and national traffic is an indirect measure of the amount of collaboration enabled by REANNZ. Increasing amounts of traffic flowing through our network indicate that more collaboration with both national and international participants is taking place. Growth on the international network will be artificially constrained until Pacific Fibre’s international cable is ready for service in the 2014/15 year.			
Number of videoconferences held	17,300	19,000	+10% pa
Number of person hours of videoconferencing	20,400 hrs	22,400 hrs	+10% pa
Videoconferencing is a good example of direct collaboration between parties. The number of conferences held, combined with the total person hours spent videoconferencing demonstrates the amount of collaboration taking place that has been enabled by REANNZ.			

Our users have cost effective access to content and tools necessary to efficiently perform their work

Many of the services required by the REANNZ community are cost-prohibitive (or simply unavailable) on the commercial market. Today, such services include schedule-able bandwidth, multi-domain circuits, flexible traffic engineering, IPv6 service and performance parity, and active multi-domain performance monitoring. These are networking features that are required by members on top of core network bandwidth. As a not for profit company that acts in the bests interests of its community, REANNZ is able to provide these services that would otherwise be unavailable to members through the commercial market.

Another way in which REANNZ contributes to this impact is by operating as a procurement vehicle, aggregating demand in order to drive down the cost of services for our members. In this sense REANNZ acts as a market provider, with members buying cost effective procured services such as videoconferencing and commodity internet through REANNZ. However, where the services REANNZ procures are more widely available in the marketplace, REANNZ often becomes a market maker, forcing competitors to drop their prices in reaction to our activity. Without our activity in the marketplace, prices would have remained high.

Being able maintain this position is dependent on the support of our members themselves. It is the strength of a co-operative that generates the buying power necessary for sustainable, lower cost services.

Indicators of our success at enabling our member's access to cost effective content and tools include:

Cost Effective Access	**Estimate 2011/12**	**Forecast 2012/13**	**Forecast 2013/15**
Members renew their service agreements	Core Members 100% Other Members 90%	Core Members 100% Other Members 90%	Core Members 100% Other Members 90%
Members subscribing to REANNZ services indicate that they are better value for money than others available in the market, as otherwise members would buy elsewhere. This demonstrates REANNZ ability to take cost out of the sector and deliver services that are relevant to our members.			

Cost Effective Access	Estimate 2011/12	Forecast 2012/13	Forecast 2013/15
Cost savings to members from settlement free peering	$85,000 p.a	$120,000 p.a	+ 10% (growth will be naturally limited until Pacific Fibre is live)
Settlement Free Peering is a method by which two networks interconnect. Peers agree to transit each other's traffic free of charge. For our members, transit of traffic over REANNZ's network rather than the commercial Internet is cheaper as commercial providers charge per unit, whereas REANNZ members pay a fixed fee regardless of how much traffic is sent or received. Each unit transited over the REANNZ network is a unit cost saved for our members. Examples of REANNZ current peering partners include Microsoft and Google.			

5. What does success look like for us?

REANNZ provides a high performance network platform that is optimised for research and education data, and services that leverage this platform. As described above, our members use this platform to conduct their science, research, education and innovation activity. Their success is dependent on our ability to provide a world-class service and success for REANNZ is the enhancement of data intensive research performance of our members.

A Full Forecast Statement of Service Performance, including performance measures by which the quality, quantity, cost effectiveness and timeliness of our services may be assessed, can be found in section nine.

6. What will we do to achieve these results?

REANNZ has set the following long term strategic priorities for delivering a service that supports the achievement of the impacts and wider outcomes outlined above:

- Engage with and facilitate higher performance from the research, education and innovation sectors
- Provide a network platform that supports production quality advanced services, networking research & development and experimental test beds
- Know our community better than anyone
- Set the global standard for user experience
- Foster a culture of continuous improvement

Each strategic priority is supported by key actions for the upcoming year.

Engage with and facilitate higher performance from the research, education and innovation sectors

The government's science and innovation agenda, and part of the Ministry of Science and Innovation's mandate, is to facilitate the transfer of knowledge and technology from the Research, Science and Technology sector to New Zealand businesses and others users, to foster commercialisation, enhance productivity and achieve wider benefits for New Zealand through the application of research results[4].

To support the government's strategy, REANNZ has developed a four-point approach:

- Enable and support specific network based research initiatives, such as the CyberSecurity initiative, NESI (New Zealand e-Science Infrastructure) and BUIC (Crown Fibre Holding's Broadband Usage and Innovation Centre)

[4] Cabinet Paper "Implementing Next Steps in Improving State Services Performance: Paper 2 – Legislative and Financial Implications" http://www.ssc.govt.nz/upload/downloadable_files/cabpaper-nextsteps-legislative-financial-implications.pdf

- Connect innovation hubs and commercialisation clusters (like Kiwinet and other joint ventures) to the research and education sectors, and to each other.
- Support industry wide special technology platforms, e.g. IPv6, international connectivity, and leading networking technologies such as Openflow.
- Directly connect innovative businesses to the research and education sectors, and to each other

Provide a network platform that supports production quality advanced services, networking research & development and experimental test beds

Breakthrough science leads to the formation of new industries and is based on disruptive innovation. Therefore, it is critical REANNZ supports this activity. Science networks that support such research are becoming increasingly a service environment. Because this market is relatively small in commercial terms, service providers typically ignore it and members of this community are often left lacking the support they need to develop and test new technologies or methods of teaching. REANNZ will provide this platform so that advanced users remain engines for innovation through access to capabilities that continue to stay ahead of what is commercially available at affordable prices.

To achieve this goal REANNZ will:

- Maintain and operate a production-quality R, E & I network platform
- Increase the breadth and quality of services available on this platform
- Plan and procure the next generation REANNZ network platform
- Support New Zealand network researchers by deploying a testbed environment that supports emerging network technologies like OpenFlow
- Leverage opportunities to participate in the proposed Network for Learning

Know our community better than anyone

A thorough understanding of how our users conduct research and facilitate learning is essential to the creation and delivery of cost-effective services and capabilities that are required by our community. Understanding new trends and the impact of technological breakthroughs will allow REANNZ and the community to quickly capitalise on them in order to further enhance New Zealand's economic competitiveness. And finally, understanding our users' motivations and drivers will enable REANNZ to better serve its community.

To achieve this goal REANNZ will:

- Deploy and use network monitoring and measurement infrastructure to better understand how the needs of our users are changing over time
- Engage with our members to enhance our understanding of user network service and capacity requirements

Set the global standard for user experience

The structure of large-scale science now assumes the availability of high-bandwidth, reliable, feature-rich networks that can interconnect globally-distributed instruments, facilities and collaborators. While this hierarchical, multi-domain, multi-scale model connects research facilities no matter where they are located, it is far from seamless. To help address these and many other challenges, REANNZ is adopting a services culture, one that puts users at the centre.

To achieve this goal REANNZ will:

- Codify and promote network best practices, including the deployment of a high performance science networking domain for NeSI
- Provide direct assistance in provisioning, monitoring and troubleshooting of network performance from the member site right through to the end user's ultimate destination

Foster a culture of continuous improvement

Looking ahead, REANNZ recognizes the oncoming data deluge is just the beginning of a long-term, data intensity trend that will only accelerate as more and more equipment becomes connected to the network and 'talk' to one another. New Zealand's researchers and educators must continuously innovate and improve, or risk falling behind in this hyper-competitive world. REANNZ must stay ahead of its users and its peers if it is to play a role in improving New Zealand's citizens' wealth and wellbeing.

To achieve this goal REANNZ will:

- Continue to operate cost effectively and sustainably
- Look to offer the Crown other opportunities to leverage its investment in REANNZ for the benefit of other sectors.

7. Organisational Capability

Structure

REANNZ is governed by a Board of Directors, appointed by its shareholding Ministers following agreement by Cabinet. REANNZ currently has four directors, with a new director currently being sought.

Current directors are:

- Professor John Raine (Chair) - to June 2012
- Professor George Benwell (Deputy Chair) – to June 2014
- Michael Riley – to June 2014
- Susie Johnstone – to June 2014

The Board appoints the Chief Executive, who is responsible for the day-to-day operations of REANNZ.

The Network Operations team is responsible for day-to-day operational management of the current REANNZ network platform, management of network supply contracts, implementation and support of new platform based services, connecting members and supporting their end-to-end network performance, and policy and planning for THE REANNZ NETWORK's use and evolution. The Network Operations team is also focussed on operating an advanced network platform, and planning for the next generation of the REANNZ network platform.

The Member Engagement team is responsible for catalysing a network-enabled community of researchers, educators and innovative institutions in New Zealand with the capabilities to take full advantage of the opportunities advanced network connectivity provides. The Member Engagement team is focused on engaging with our members to identify ways in which REANNZ can help them perform their work more effectively.

The Corporate and Finance team provides administrative, financial and general compliance support across the organisation, ensuring REANNZ continues to run efficiently and effectively.

Capability

As a small organisation, REANNZ is critically dependent upon its human resources. The highly specialised nature of REANNZ's work means these resources are relatively rare and expensive.

REANNZ promotes and supports flexible working and a good work-life balance. The nature of our work provides exciting, leading edge opportunities for personal and professional development.

Good Employer

To ensure that REANNZ meets its Good Employer obligations prescribed in the Crown Entities Act Part 3 Section 118, REANNZ will provide opportunities to:

- Enhance the abilities of individual employees
- Recognise the aims, aspirations and employment requirements of women, and the cultural differences of ethnic or minority groups
- Recognise the employment requirements of persons with disabilities.

REANNZ values the uniqueness of its employees and their contribution to the organisational personality and culture. Being responsive to a diverse range of viewpoints and cultures within the workplace will help the organisation develop a more representative workforce able to respond to an increasingly diverse NZ society.

Sustainability

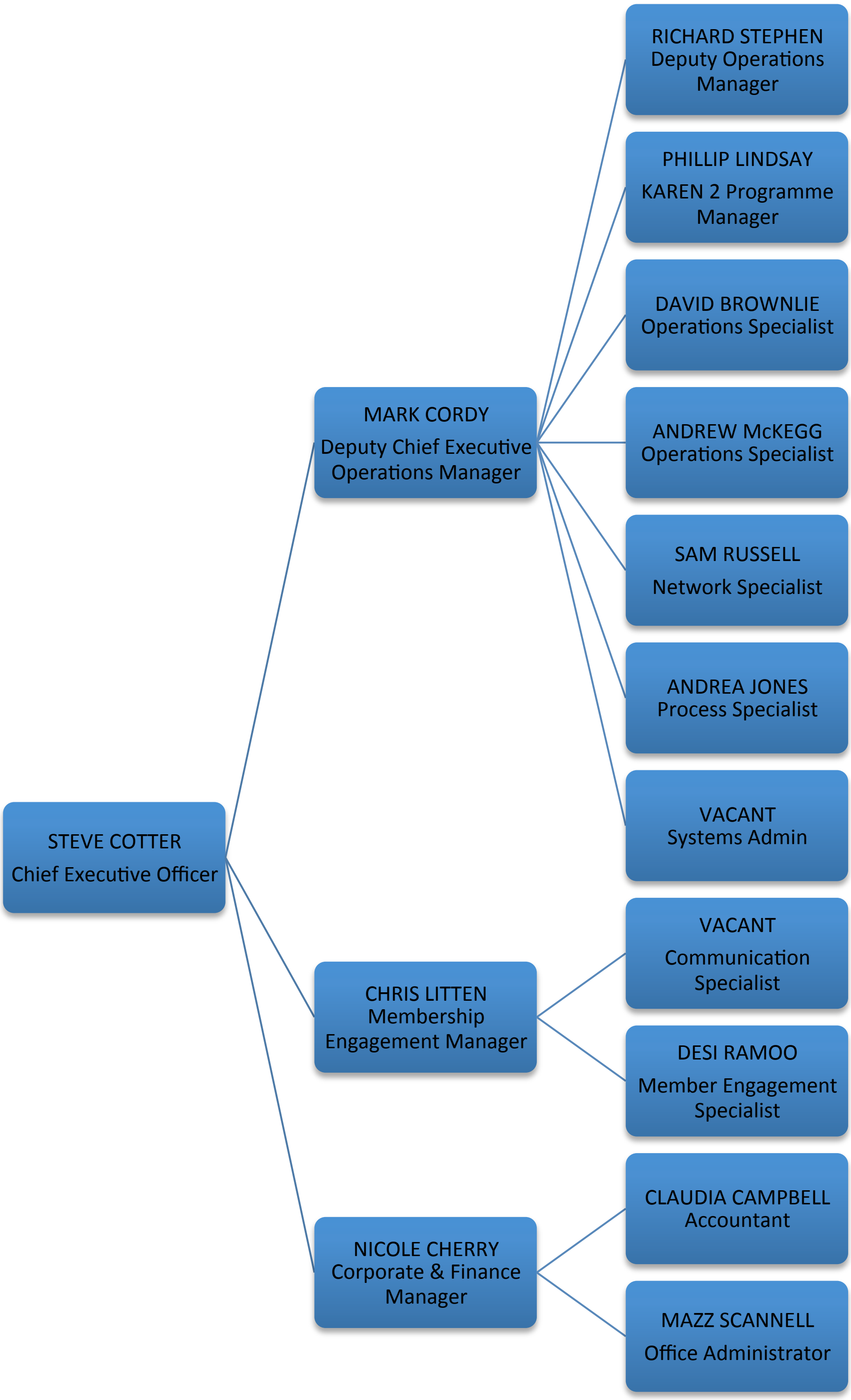
In 2011, REANNZ secured revenue commitments from members and the Crown sufficient to ensure that the REANNZ network could be sustainably delivered and supported for the foreseeable future. REANNZ has developed a four pillar approach to ensuring the financial sustainability of the network and the Company over the long term. These include:

- Active Revenue Management,
- Moving to a lower unit cost network,
- Containing corporate costs, and
- Active Cash Management.

REANNZ actively monitors its business risks and has appropriate mitigation strategies in place.

REANNZ

Organisational Chart



8. Accountability

Corporate

REANNZ is a Crown-owned company, listed under schedule 4 of the Public Finance Act 1989 and incorporated under the Companies Act 1993. Its current shareholders are the Minister of Finance and the Minister of Science and Innovation. Each shareholder holds 908 shares on behalf of the New Zealand public.

Although REANNZ is not a Crown Entity listed under the Crown Entities Act 2004, it is the intent of the shareholders that it acts in a manner consistent with the Crown Entities Act. REANNZ is subject to the Official Information Act 1982.

The functions and purpose of the company are contained in its Constitution and further augmented by an annual Letter of Expectations from shareholding Ministers.

REANNZ's performance is currently monitored by the Ministry of Science and Innovation. The Ministry of Science and Innovation, in partnership with Treasury, maintain policy oversight roles with respect to REANNZ's outcomes. It is anticipated that the Ministry of Business, Innovation and Employment will take on the monitoring role, once it has been established.

Stakeholders

As a network company – both literally and figuratively – REANNZ must retain excellent relationships with a large number of members, government and non-government stakeholders.

Key working relationships are important with:

- Members, Associates and Partners
- Ministry of Science and Innovation (soon to be the Ministry of Business, Innovation and Employment) – as monitoring agency and financial analysts
- Crown Ownership Monitoring Unit – as shareholders' financial analysts

- Ministry of Economic Development – as a coordinator of telecommunications policy in government, and funder of digital strategy initiatives
- Tertiary Education Commission – as policy development and implementation agent for the tertiary education sector
- Ministry of Education – as policy development and co-ordinator of technology strategies for schools
- Supplier partners – the local and national fibre providers and local wireless providers
- Internet community – InternetNZ and related community for their foresight and influence
- Other NRENs – to ensure good transit and peering agreements and to leverage their experience.

Acquisitions and disposals

While it is unlikely that the Board will seek to acquire or form a subsidiary, it would only take such action after providing adequate written notice seeking shareholding Ministers' approval of its intentions, in accordance with Government policy.

REANNZ will advise the shareholding Ministers, in consultation with the Ministry of Science and Innovation, where it is contemplating new investments exceeding $1.5 million per transaction (or related set of transactions), and will seek shareholding Ministers' approval in advance for new investments exceeding $3 million per transaction (or related set of transactions).

Reporting

Annual Report

An Annual Report will be made available to Ministers within four months of the end of each financial year. It will comply with the reporting provisions of the Crown Entities Act 2004, the Companies Act 1993, and the Financial Reporting Act 1993.

Statement of Intent

A draft of our Statement of Intent will be made available to shareholding Ministers no later than one month prior to the commencement of the financial year.

Quarterly Reports

Quarterly reports will be submitted to shareholding Ministers providing provisional financial and non-financial performance data, measured against the forecasts in this Statement of Intent. This information will be provided through CFISnet, the Crown's Financial Information System.

Other Information

REANNZ will provide other information relating to the affairs of the Company as requested by its shareholding Ministers.

9. Forecast Statement of Service Performance 2012-2013

REANNZ's sole output is the high performance network infrastructure and tools that are optimised for research and education. The below service performance measures and prospective statement of service performance relate to the delivery of this output.

Performance Measures

Quality

The quality of our service can be measured by the reliability of the network and its reach.

	Actual 2009/10	Actual 2010/11	Estimate 2011/12	**Target 2012/13**
National Network availability	99.98% 12 month rolling average	99.90% 12 month rolling average	99.9% 12 month rolling average	**99.9% 12 month rolling average**

	Actual 2009/10	Actual 2010/11	Estimate 2011/12	**Target 2012/13**
International Network availability	99.98% 12 month rolling average	99.90% 12 month rolling average	99.7%[5] 12 month rolling average	**99.9% 12 month rolling average**

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

[5] During 2011/12 some hardware in our Los Angeles PoP suffered an unplanned outage that was not able to be promptly fixed. As a result of this, REANNZ is putting in place redundant international hardware to ensure that a similar outage in the future does not effect network availability.

Our goal is to maintain this level of reliability. Network reliability is a function of cost, as every order of magnitude increase in reliability is usually matched by a greater order of magnitude increase in network costs, due to the need to purchase additional resilient circuits. REANNZ aims for network reliability to be as high as possible, given the need to balance the costs associated with each magnitude increase.

	Actual 2010/11	Estimate 2011/12	**Target 2012/13**
Routes available to REANNZ members compared to those available to Internet2 members (US based NREN)	**IPv4** ≥ 100% of Internet2 routes available to REANNZ members **IPv6** ≥ 90% of Internet2 routes available to REANNZ members	**IPv4** 102% of Internet2 routes available to REANNZ members **IPv6** 103% of Internet2 routes available to REANNZ members	**IPv4** **≥ 100% of Internet2 routes available to REANNZ members** **IPv6** **≥ 100% of Internet2 routes available to REANNZ members**

This measures the reach (or connectedness) of the REANNZ network. Each route represents a different Internet destination. IPv4 and IPv6 are different Internet addressing protocols, both of which are supported on the REANNZ Network. Domestic and international route availability reflects how "well connected" our membership base is. Our aim is to ensure New Zealand researchers have access to the same locations as their international peers, so that they remain competitive and be able to participate in world-class science.

We compare route availability on the REANNZ network to that of Internet2, the US network with a membership of over 200 US based universities. Internet2 is a large, well connected network. We aim to have at least as many routes available to REANNZ members as are available to Internet2 members, which is why we can have more than 100% of the Internet2 routes available.

Quantity

The quantity of the services we provide is demonstrated by the amount of network capacity we provide our members.

	Actual 2010/11	Estimate 2011/12	**Target 2012/13**
Core network capacity available	10 Gb/s National 1 Gb/s International	10 Gb/s National 1 Gb/s International	**10 Gb/s National** **1 Gb/s International**

Our current network contracts provide for 10Gb/s on the core national network, and 1Gb/s on our core international network. Work is underway on planning for the next generation REANNZ network that is expected, subject to the demand case, to deliver increases in national capacity from the 2013/14 financial year. The Pacific Fibre cable, which is expected to be ready for service in 2014, will increase international capacity to 40 Gb/s, increasing to 160 Gb/s over time.

Cost Effectiveness

The cost effectiveness of the REANNZ network platform is best demonstrated by our ability to retain our core membership base. If we were not cost effective and providing valuable networking solutions, alternative suppliers would enter the market, and we would lose our membership base.

	Actual 2010/11	Estimate 2011/12	**Target 2012/13**
REANNZ maintains its core membership base	8/8 Universities 8/8 CRIs 13/20 ITPs 2/3 Wanangas	8/8 Universities 8/8 CRIs 13/20 ITPs 2/3 Wanangas	**8/8 Universities** **8/8 CRIs** **13/20 ITPs** **2/3 Wanangas**

REANNZ addresses a niche market that commercial networks cannot - the provisioning of the unique services that meet science, research and education needs. Comparisons of cost with commercial telecommunications providers are

misleading, as not only is our network designed to be under-utilised[6], but the network has other attributes which commercial networks cannot provide. Performance is more valuable to our members than maximising utilisation.

Likewise, it is difficult to compare cost structures with international NRENs, as each country operates its network differently, with a different array of services on offer, geography and telecommunications supply markets; all of which significantly affect the cost of delivering a world class network.

Timeliness

		Target 2012/13
Member Survey of helpdesk users	new measure	**75% of users considered issues to be resolved in a timely manner.**

The speed at which we identify and resolve faults and other network performance issues is a measure of the timeliness of our network management activity. The REANNZ helpdesk logs incident reports from users, and our service manager actively monitors the network for performance issues. Although we have target resolution times agreed with our suppliers, the true test of our timeliness is our members' perception of our responsiveness to their issues.

[6] Excess capacity is required to allow for the infrequent by high data flows that science and innovation require.

Prospective Statement of Service Performance

Output: The Advanced Research, Education and Innovation Network and Related Tools	
2012/13	**$ 000**
Revenues	
Grant Income	1,179
Membership Fees	8,260
Other	1,953
Total Income	**11,392**
Expenses	
Amortisation & Depreciation	794
Network Expenses	7,683
Corporate Expenses	3,293
Total Expenditure	**11,770**
Surplus/(Deficit)	**(378)**

10. Prospective Financial Statements

Prospective Statement of Comprehensive Income

Research and Education Advanced Network New Zealand Limited
For the year ending 30 June

F'cast 2012 $000		**2013** $000	**2014** $000	**2015** $000
	REVENUE			
3,468	Grant income	1,179	16,588	4,000
6,295	Network income	8,260	8,132	8,179
887	Other income	1,375	1,092	1,383
492	Interest income	578	320	238
11,142	**Total Revenue**	**11,392**	**26,132**	**13,800**
	EXPENSES			
35	Audit fees	35	36	37
1,595	Amortisation & depreciation	794	1,300	1,979
140	Directors fees	143	147	151
1,981	Employment expenses	2,003	2,063	2,125
7,221	Network expenses	7,683	9,322	9,683
445	Other operating expenses	523	543	559
446	Professional services	359	312	322
110	Rental and lease expenses	110	113	171
123	Travel and vehicle expenses	120	124	127
12,096	**Total Expenses**	**11,770**	**13,960**	**15,153**
(954)	**Surplus/(Loss) before Taxation**	**(378)**	**12,172**	**(1,353)**
-	Taxation	-	-	-
(954)	**Net Surplus/(Loss) after Taxation**	**(378)**	**12,172**	**(1,353)**
-	Other Comprehensive Income	-	-	-
(954)	**Total Comprehensive Income/(Loss)**	**(378)**	**12,172**	**(1,353)**

Prospective Statement of Cashflows

Research & Education Advanced Network New Zealand Limited
For the year ending 30 June

F'cast 2012 $000		2013 $000	2014 $000	2015 $000
	CASH FLOWS FROM OPERATING ACTIVITIES			
	Cash was provided from (applied to)			
2,412	Crown revenue	-	16,588	4,000
1,341	Other Government Department funding	1,182	98	-
5,569	Network Income	8,260	8,132	8,179
492	Interest received	578	320	238
299	Sundry income	642	529	892
(140)	Net GST	11	(189)	75
(5,634)	Payments to suppliers and employees	(6,051)	(5,545)	(6,482)
(763)	Prepayment for Network Connectivity	(652)	(19,055)	(4,900)
3,576	**Net Operating Cash Flows**	**3,969**	**878**	**2,002**
	CASH FLOWS FROM INVESTING ACTIVITIES			
	Cash was provided from (applied to)			
(113)	Purchase of plant & equipment	(300)	(16,743)	(126)
(6,600)	Term investments	(3,900)	16,500	-
(6,713)	**Net Investing Cash Flows**	**(4,200)**	**(243)**	**(126)**
	CASH FLOWS FROM FINANCING ACTIVITIES			
	Cash was provided from (applied to)			
-	Issue of equity share capital	-	-	-
-	**Net Financing Cash Flows**	**-**	**-**	**-**
(3,137)	**Net (decrease)/increase in cash held**	**(231)**	**635**	**1,876**
7,008	Cash at beginning of year	3,871	3,640	4,275
3,871	**Cash at end of year**	**3,640**	**4,275**	**6,151**
	Represented by:			
3,871	**Cash at bank**	**3,640**	**4,275**	**6,151**

Prospective Statement of Financial Position

Research & Education Advanced Network New Zealand Limited
For the year ending 30 June

F'cast 2012 $000		2013 $000	2014 $000	2015 $000
	CURRENT ASSETS			
3,871	Cash and cash equivalents	3,640	4,275	6,151
12,600	Investments	16,500	-	-
2,589	Receivables and debtors	2,457	2,431	2,443
616	General prepayments	616	616	616
4,877	Prepaid network expenses	3,646	1,742	769
24,553	**Total Current Assets**	**26,859**	**9,064**	**9,979**
	NON-CURRENT ASSETS			
1,790	Property, plant & equipment	1,339	16,800	14,953
27	Intangible assets	7	4	2
3,717	Prepaid network expenses	754	14,607	13,838
5,565	**Total Non-Current Assets**	**2,100**	**31,411**	**28,793**
	CURRENT LIABILITIES			
354	Account payable & accrued expenses	429	432	470
182	GST Payable	175	2	93
200	Employee entitlements	200	200	200
2,315	Income in advance	2,006	2,059	2,030
540	Deferred Income	540	450	181
3,591	**Total Current Liabilities**	**3,350**	**3,143**	**2,974**
	NON-CURRENT LIABILITIES			
1,170	Deferred Income	630	181	-
1,170	**Total Non-Current Liabilities**	**630**	**181**	**-**
25,357	**NET ASSETS**	**24,979**	**37,151**	**35,798**
	PUBLIC EQUITY			
16,001	Share capital	16,001	16,001	16,001
9,356	Accumulated surplus	8,978	21,150	19,797
25,357	**Total Public Equity**	**24,979**	**37,151**	**35,798**

Prospective Statement of Movements in Public Equity

Research and Education Advanced Network New Zealand Limited
For the year ending 30 June

F'cast 2012 $000		2013 $000	2014 $000	2015 $000
26,311	**Public Equity at beginning of year**	**25,357**	**24,979**	**37,151**
(954)	Comprehensive Income for the year	(378)	12,172	(1,353)
-	Share Capital introduced	-	-	-
25,357	**Public Equity at end of year**	**24,979**	**37,151**	**35,798**

Nature and purpose of prospective financial statements

The prospective financial statements above have been prepared to the best of our knowledge and belief as an indication of REANNZ's future financial performance. Actual financial results achieved for the period covered may vary from the information presented, potentially in a material manner.

The purpose of the prospective financial statements is to inform readers of this Statement of Intent of REANNZ's best estimate of its future financial performance at the date of publication, and to comply with REANNZ's specific reporting and disclosure obligations. The statements may not be suitable for other purposes.

Statement of significant assumptions

The prospective financial statements have been prepared on the basis of the following key assumptions:

1. REANNZ invests in dark fibre just prior to the expiry of current national network arrangements
2. No expansion or augmentation of the national or international network takes place until the 2013/14 financial year (the end of current network arrangements)

Income

- A $4 million Crown operating contribution has been forecast from 1 July 2013. A Crown contribution towards REANNZ's anchor tenancy on a new submarine cable totalling $15 million is forecast to be received in two stages, $2.4 million was received in 2011, with the remaining $12.6 million expected in 2014.
- All existing network revenue contracts have been forecast to continue, with network income from core members expected to increase in line with inflation annually from January 2014.
- On a conservative basis, no schools income or National Education Network income has been forecast past the end of the current National Education Network trial in June 2013. Income to June 2013 has been forecast in line with REANNZ's current agreement with the Ministry of Education.

- Videoconferencing fees are forecast at current contracted rates until the end of current contracts in July 2013. It is likely that the service will continue past this date, however revenues have not been forecast past this time due to the uncertainty around the exact nature of the service that will be procured. Additional service revenues are expected to match the costs of any new or extended service.
- Revenues relating to the recently implemented REANNZ Internet service are forecast on an ongoing basis, with revenues expected to increase in line with take up of the service and growing commodity internet traffic demand.

Network Costs

During the 2010/11 year REANNZ executed new national and international network connectivity arrangements. These contracts expire in December 2013 and August 2014 respectively. Budgeted network costs reflect the actual contracts entered into.

In July 2011, REANNZ entered into anchor tenancy agreement on a new international submarine cable. We expect this cable to be ready for service in January 2014 and have forecast a significant prepayment for international connectivity of US$10 million at this time. A USD:NZD exchange rate of 0.71 has been used to translate this prepayment, based on the expectation that the NZD$15 million grant from the Ministry of Economic Development will meet the prepayment required.

The actual timing of payments under the anchor tenancy agreement is dependent on the date at which the international submarine cable is ready for service, and may vary from those forecast. A foreign exchange rate of USD:NZD 0.65 has been used for expected ongoing payments under this contract.

At the expiry of current national network arrangements in December 2013, it is forecast that an option to purchase long-term dark fibre rights will be exercised. The infrastructure required for this is expected to be purchased early in the 2013/14 financial year. This involves a significant cash outlay for fibre assets as well as the purchase of new optical hardware.

The actual timing of national network expenditure from 2013/14 will depend on the project plan for KAREN2, and may vary from that forecast.

It is expected that both the move to dark fibre and new international connectivity arrangements will significantly increase capacity on the core network.

The current National Education Network trial, as well as the current REANNZ Videoconferencing service (which may be upgraded), are forecast to end in June 2013. Ongoing network costs associated with these projects have been forecast to cease from 1 July 2014.

The new REANNZ Internet service is expected to continue indefinitely, and costs associated with providing this service have been budgeted accordingly.

Corporate Costs

REANNZ continues to contain corporate expenses, with corporate costs for 2012/13 (total expenses less network expenses and depreciation & amortisation) only $42,000 higher than the 2012/13 budget contained in last year's Statement of Intent. This is despite the costs of insurance increasing significantly as a result of the Christchurch Earthquake and the additional costs of the REANNZ Internet Service, which are being recovered through service revenues.

General cost escalation on corporate costs has been forecast at 3% per annum thereafter, with the exception of office rental, which is expected to increase in 2015 as we anticipate a move to more earthquake safe office premises.

Capital Expenditure

Capital Expenditure forecast for the three years from 2011/12 is as follows:

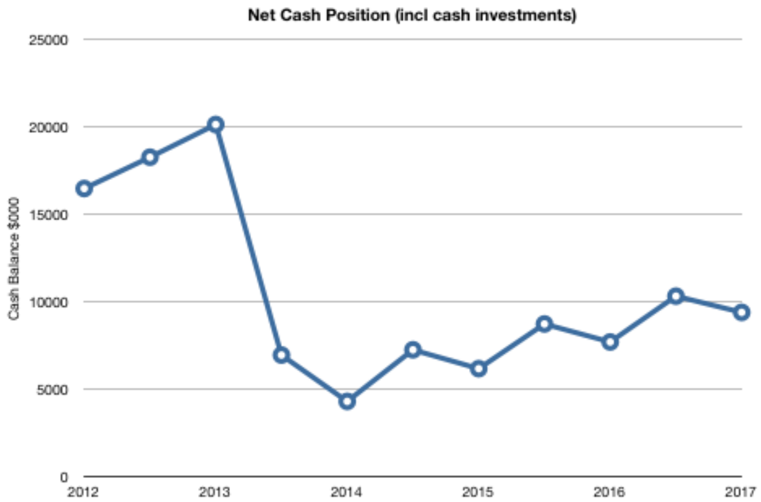
	2012/13	**2013/14**	**2014/15**
Corporate	100	58	30
Network	187	16,700	100
Projects	36	-	-
Total	**324**	**3,148**	**3,687**

Significant network asset purchases in 2013/14 relate to the purchase of optical hardware and dark fibre for the move to the new national network. Corporate asset purchases increase in 2012/13 in line with timeframes for office ICT equipment refreshes, with office fit out in 2013/14 expected with the move to new office premises.

Cash

REANNZ builds significant cash reserves to fund periodic network reinvestment. Reinvestment in the national and international network is forecast to begin in July 2013, after which REANNZ begins to rebuild its cash reserves for the next investment cycle.

Interest on cash balances has been forecast at 3% pa.



Financial Position

- 30 day terms for accounts payable and accounts receivable have been used for the purposes of this forecast

Taxation

- REANNZ is exempt from income tax in terms of the Income Tax Act 2007. Accordingly, no income tax has been provided for.
- GST has been forecast at the current rate of 15%

11. Notes to the Prospective Financial Statements

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 communication 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 New Zealand Equivalents to International Financial Reporting Standards.

Basis for preparation

Statement of Compliance

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

The prospective financial statements comply with the New Zealand Equivalents to International Financial Reporting Standards ('NZ IFRS') and other applicable financial reporting standards as appropriate for public benefit entities.

Measurement Base

The prospective financial statements have been prepared on the basis of historical cost, except where modified by the revaluation of certain items of Property Plant and Equipment, and the measurement of derivative financial instruments at fair value. The accounting policies for these items are stated below.

Functional Currency

The prospective financial statements are presented in New Zealand dollars, rounded to the nearest thousand ($000). The functional currency of REANNZ is New Zealand dollars.

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.

The following significant accounting policies have been adopted in the preparation and presentation of the prospective financial statements:

a) Revenue recognition

Revenue is measured at the fair value of the consideration received or receivable.

Grant income is recognised by REANNZ as it is received or receivable from the Crown, when the conditions relating to the grant are met. Where there are no conditions attached to the grant, other than the requirement for REANNZ to own and operate a high speed communication network for the research and education sector, grant income is also recognised as it is received or receivable. Where grant income has been received but the conditions of the grant are not yet satisfied, grant income is recognised as income received in advance in the statement of financial position.

Interest revenue is recognised using the effective interest method.

b) Property, plant and equipment

Property plant and equipment asset classes consist of office equipment, ICT equipment, national PoP equipment, leasehold improvements and network services equipment.

Property, plant and equipment are stated at cost or valuation less accumulated depreciation and any impairment losses. Cost includes consideration given to acquire or create the asset and any directly attributable costs of bringing the asset to working condition for its intended use.

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.

Where an asset is acquired at no cost, or for a nominal cost, the asset will be recorded at fair value at the date when control of the asset is obtained.

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 Income.

Assets under construction are held in work in progress until they are completed, at which point they are transferred to the appropriate category of property, plant and equipment.

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 Income as they are incurred.

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:

Dark Fibre	20 years
DWDM Transmission Equipment	10 years
Pop Equipment	8 years
Routers & switches	5 - 7 years
Information technology equipment	3 years
Information technology software	3 years
Office equipment	5 years
Leasehold improvements	6 years

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

c) *Intangible assets*

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. The following amortisation rates are used in he calculation of amortisation:

Software	3 years

d) *Impairment*

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 Income.

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 Income.

Any reversal of an impairment loss is recognised in the Statement of Comprehensive Income. 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 which 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 Income, a reversal of impairment loss is also recognised in the Statement of Comprehensive Income.

e) *Borrowing costs*

Borrowing costs are recognised as an expense in the period in which they are incurred.

f) *Inventories*

Inventories held for sale or use in the provision of services on a commercial basis is valued at the lower of cost and net realisable

value. The cost of purchased inventory is determined using the first-in first-out method. The write down from cost to net realisable value is recognised in the Statement of Comprehensive Income, in the period when the write-down occurs.

g) Operating leases

Operating lease payments, where the lessors effectively retain substantially all the risks and benefits of ownership of the leased items, are included in the Statement of Comprehensive Income. Where the leased items are in use, operating lease payments are allocated in equal instalments 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 income, these prepayments are released to the Statement of Comprehensive Income on a straight line basis over the period of the remaining operating lease term.

h) Financial assets

Investments

For investments under a contract where the terms require delivery within a specified timeframe, the investment is recognised on the date of trade at fair value, net of transaction costs.
Other financial assets are classified into "Cash and cash equivalents" and "receivables". The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition.

Cash and cash equivalents

Cash and cash equivalents comprise cash on hand; cash held in banks, other short-term highly liquid investments with original maturities of three months or less and are net of outstanding bank overdrafts.

Receivables

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 Income.

i) Financial liabilities

Payables

Accounts payable, comprising trade payables and other accounts payable, are recognised when REANNZ becomes obliged to make future payments resulting from the purchase of goods and services. Payables are initially measured at fair value and subsequently measured at amortised cost using the effective interest method.

j) Derivatives

REANNZ enters into a variety of 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 these financial instruments for trading purposes.

Financial instruments that constitute hedges, including forward foreign exchange contracts, are valued at the prevailing exchange rate at year end. Any unrealised gains or losses are recognised in the Statement of Comprehensive Income.

Financial instruments that do not constitute hedges are stated at fair value and any resulting gain or loss is recognised in the Statement of Comprehensive Income.

k) Foreign currency transactions

Transactions in foreign currencies are translated to New Zealand dollars at the rate applying at the date of transaction.

At balance date foreign currency monetary assets and liabilities are translated at the closing rate and exchange variations arising from these translations are recognised in the Statement of Comprehensive Income.

l) Employee entitlements

Provision for accrued annual leave is made when it is probable that settlement will be required and the provision is capable of being measured reliably.

Provisions made for employee benefits expected to be settled within 12 months of the reporting date are measured using the best estimate of the amount required to settle the obligation, based on the remuneration rate expected.

Provisions made in respect of employee benefits which are not expected to be settled within 12 months of the reporting date are measured at the present value of the estimated future cash outflows to be made in respect of services provided by employees up to reporting date.

m) Taxation

REANNZ, as a public entity, is exempt from taxation. Accordingly, no charge for income tax has been provided for.

n) Cash flow statement

The Prospective Cash Flow Statement is prepared exclusive of GST, which is consistent with the method used in the Prospective Statement of Comprehensive Income.

Definitions of the terms used in the cash flow statement are:

“Cash” includes coins and notes, demand deposits and other highly liquid investments readily convertible into cash and includes at call borrowings such as bank overdrafts, used by REANNZ as part of its day to day cash management.

“Investing activities” are those activities relating to the acquisition and disposal of current and non-current investments and any other non-current assets.

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

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

o) Goods and Services Tax (GST)

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

The net GST paid to, or received from, the Inland Revenue Department, 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.

p) Compliance

REANNZ's prospective financial statements have been prepared in compliance with FRS-42 and in accordance with generally accepted accounting practice, and are compliant with NZIFRS.

12. Glossary of Terms

Acronym	Term	Definition / Description
Core Member		Universities and Crown Research Institutes connected to the REANNZ Network
Gb/s	Giga Bits per Second	The speed at which traffic is transferred across the network. 1 Gb = 1,024 Mb (Megabits)
Internet2		The US national NREN, with a membership of over 200 US based universities.
IPv4 / IPv6	Internet Protocol version 4 / Internet Protocol version 6	Internet addressing protocols. IPv6 addresses are becoming more prevalent as IPv4 addresses "run out" globally.
REANNZ RFC	Kiwi Advanced Research & Education Network Request for Comment	A formal process through which members can provide views on matters relating to REANNZ services.
REANNZ Working Group		A group of member nominees working together to provide representative views on major pieces of work.
NREN	National Research and Education Network	The name given to research and education networks globally
PB	PetaByte	A measure of the quantity of traffic. 1 PB = 1,024 TB (Terra Bytes) 1 TB = 1,024 GB (Giga Bytes) 1 GB = 1,024 MB (Mega Bytes) or 8 Gb (Gigabits)
PoP	Point of Presence	A place in which members can connect to the REANNZ Network.

Acronym	Term	Definition / Description
REANNZ	Research and Education Advanced Network New Zealand Limited	A limited company owned by the Crown, which owns and operates the REANNZ Network.