This submission is not directed at specific questions outlined in the issues paper but instead makes a number of general points covering a range of issues.

Background:

REANNZ (Research & Education Advanced Network NZ) is the the Crown company established in 2005 to procure and deliver a dedicated, high-speed research network for the New Zealand research and education sectors. New Zealand was one of the last developed countries to have a dedicated R&E network (compared with the JANET Network in the UK launched in 1976 and AARNet in Australia in 1989 for example). REANNZ's shareholding Ministry is MBIE, reporting through to the Minister of Science and Innovation.

Launched in mid-2006 it was known originally as the KAREN (Kiwi Advanced Reasearch and Education Network) The (now) REANNZ Network now connects all New Zealand's universities and CRIs, most ITPs, and a number of other independent research entiities such as the Cawthron and Malaghan Institutes and the Auckland War Memorial Museum.

REANNZ's primary role is to support high-end, data-intensive research and to facilitate such leading edge research locally and with global peers. The REANNZ network connects directly to over 110 similar national research and education networks (NRENs) around the world. Traffic is passed between NRENs at no cost and avoids traversing "the internet" and the associated standard telco pricing and bandwidth allocation models.

As the primary provider of internet and research connectivity domestically and globally to the bulk of the tertiary sector (excluding PTEs) REANNZ has seen massive growth in bandwidth usage by connected members. The growth in this traffic in the last 10 years (and in particular the last two) has been driven by many of the individual, internet-based technology initiatives that are being delivered in various forms across the tertiary sector as a whole.

New Zealand researchers are generally held in high regard globally, especially in specific areas such as genomics, agri-tech, biosecurity, food/nutrition security, marine and climate sciences and other associated sectors of traditional national expertise. Many of these sectors have increasingly high data requirements.

While research and research outputs *per se* are not the primary focus of the Productivity Commision's ToR we believe that a number of the documented challenges faced by the research community are part of the wider set of challenges facing the tertiary sector, and they will no doubt be identified by other submitters.

Points we would note:

Savings through shared Infrastructure:

A lot of the investment we see occurring has been in backend/administrative systems such as HR or Financials. Each university/ITP is responsible for their own procurement of each component of their own internal systems in the belief that they each have a unique character that needs to be addressed. The costs associated with each procurement are often large. We believe that in the current cost-constrained enviroment NZ there should be a greater degree of harmonisation of infrastructure. The W2 initiative currently underway between Whitireia and WelTec provides an example in the ITP sector, but we believe there are opportunities for similar collaboration in the university sector. One topical example is in the recent adoption of the Canvas LMS by The University of Auckland. The

Canvas company is now (quite reasonably) working to sell that product to other tertiary institutions, each of whom will need to go through a long and expensive procurement process. Contrast that with the Florida State University system where that same product has been recently been made available to the 20 plus universities in that state, at a no doubt considerable savings in upfront cost.

Strategic View of the Value of ICT:

One of the recent trends in the US (and other) university systems is for the CIO to be part of the executive, as opposed to reporting to the CFO. This is often not the case in NZ where ICT is often seen as an administrative function or an expenditure item to be constrained, rather than as a strategic investment in the future. We have seen a number of instances where the expnditure of relatively small sums of money (<$50K) to support specific research technologies have been blocked by the CFO (or equivalent) due to "funding constraints". Ths does not augur well for NZ's ongoing research facility.

Given the emphasis currently placed on CIOs, they are very busy with "keeping the lights on" and providing a high standard of IT across the instiution. Ther are not, therefore, always well-placed to support specific hi-tech research or innovative teaching and learning requests.

A recent university CIO's position was offering a salary that we believed (based on similarly sized institutions globally) was unlikely to attract suitable applicants with the relevant skills, qualifications and strategic oversight that a university CIO requires in the second decade of the 21st century.

New Teaching and Learning Models:

New Zealand schools are achieving a lot as part of the digital transformation occurring in education. The completion of the national fibre rollout to schools in 2016, the establishment of the N4L and the results of prior investment in ICT Professional Development in schools and 10 years of a teacher laptop programme have all resulted in a (generally) tech savvy teacher workforce and a cohort of students that have constant access as part of their daily lives. Feedback from a number of our members is that a number of tertiary lecturers are not well-prepared for the skill level of students now coming out of the compulsory education sector. Their expectations are high and (as noted above) they are sometimes frustrated by the levels of access available in tertiary.

One university IT person told us last year that "the reason we have such poor wifi in the (university) library is due to the number of books there and they reduce the wifi signal"". Given that libraries are generally part of the learning centre of the university we were surprised that this area was not seen as an important place for suitable investment.

Technology Driving New Models of Delivery:

We belive there are greater oportunities for NZ institutions to take advantge of improved global connectivity to allow delivery of niche and customised education products and services offshore. Massey University's Worldwide programme delivers such programmes such as a customised MBA in aviation. Distance education has a long tradition at Massey but generally across the sector the focus is very much on bringing students to NZ, rather than the (admittedly) more challenging delivery overseas approach. Could institutions collaborate more to (say) offer an "NZ university qualification"?

The highly ranked (top 30) New York University is part way through investing US$1B to internationalise it's delivery. It is planned that approximately 10% of that sum is going on the procurement of global connectivity. Our conversations with NZ institutions show little appetite for (proportionately sized) approaches such as this. We would be keen to work with any academic consortium who would see opportunities in joint ventures with universities in South/East Asia or South America (to give two examples) where improving connectivity provides a range of opportunities to deliver content rich material in innovative ways to local students. This is an opportunity to showcase New Zealand's innovatice teaching approaches that are held in high across the world.

More joined up thinking around connectivity:

New Zealand currently has four separate networks – Connected Health for the health sector, one.govt/TaaS for public sector, N4L for primary and secondary schools and REANNZ for tertiary education. We would like to see more opportunity for these networks to interconnect where there is mutual benefit.

As an example of this, the New Zealand National Library and National Archives are both connected to the government network (one.govt/TaaS) and cannot therefore reach the universities and other global libraries that are on their relevant countries research network. This includes the Library of Congress in the USA, the British Library in the UK and equivalents in the Netherlands and Australia.

While this is only a small example we believe it illustrates that there is further opportunity to streamline the delivery of digital material to end users especially given the increasing volumes of data traversing institutions.

Summary:

Connectivity in general is driving much in education nationally and globally. This covers both the teaching and learning area as well as the research component of tertiary education in general. As New Zealand's dedicated R&E network REANNZ is keen to provided strategic and practical help where possible to advance the wider tertiary teaching, learning and research agenda.

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