BUILDING THE BENEFITS OF BROADBAND

How New Zealand can increase the social & economic impacts of high-speed broadband

Alcatel·Lucent

CONTENTS

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1. INTRODUCTION

New Zealand is on the edge of a new communications era. The Ultra-Fast Broadband (UFB) project and Rural Broadband Initiative (RBI) are set to radically improve the speed and capacity of the high-speed broadband networks available to nearly 98 percent of New Zealanders.

Andrew Miller
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This study outlines an economic analysis undertaken by Bell Labs, the research and innovation engine of Alcatel-Lucent, on the social and economic impacts for New Zealand of UFB and RBI, and the high-speed broadband applications that these networks will enable.

The study takes a hybrid approach to measuring the benefits of high-speed broadband. First, it employs a traditional macro-economic approach to measure the GDP impact of building the UFB and RBI networks, and shows the incremental growth in GDP stemming from the network builds will be $5.5 billion over 20 years, significantly larger than the Government's $1.5 billion capital contribution.

Second, it uses a 'grass-roots' analysis to quantify the likely end-user economic benefits, called consumer surplus gains by economists, of a sample of high-speed broadband applications across the healthcare, education, business and agriculture sectors. The broadband applications considered include online doctor consultations, remote learning, teleworking and online farm management tools among a number of others.

It calculates that the economic benefits to New Zealand end-users of the high-speed broadband applications considered will amount to $32.8 billion over 20 years. The calculation is based on an assumed steady-state average application adoption rate of 40 percent, which is reached in the seventh year.

The economic model developed for this study by Bell Labs demonstrates that a strong correlation exists between key variables and the total consumer surplus gains. The key variables include:

1. Availability of relevant applications
2. Speed of broadband application adoption
3. Total level of broadband application uptake

The study concludes with ideas on how New Zealand can positively impact these three key variables, thereby increasing the economic benefits stemming from the UFB and RBI networks, and the broadband applications that will be delivered across them.

Alcatel-Lucent is a key participant in both UFB and RBI, and is working with a number of key players to design, build and operate these networks for New Zealand.

Alcatel-Lucent has been in New Zealand since the 1920s, building and maintaining our country's telecommunications lifelines. Alcatel-Lucent believes strongly that ICT innovation can be a powerful catalyst for social and economic development.

This study was commissioned by Alcatel-Lucent to stimulate discussion about what New Zealand can do to ensure that UFB and RBI underpin a new wave of ICT innovation, and contribute strongly to New Zealand's social and economic development.

2. THE ULTRA-FAST BROADBAND AND RURAL BROADBAND INITIATIVES

Ultra-Fast Broadband (UFB) and the Rural Broadband Initiative (RBI) are part of a government program to expand and develop New Zealand's broadband services. UFB will bring high-speed fibre-optic technology to homes, schools, hospitals, and businesses. Ultimately, 75 percent of New Zealanders will have access to ultra-fast broadband. Schools, hospitals and 90 percent of businesses will be connected by 2015. Homes and the remaining 10 percent of businesses will be connected by 2019. Fibre will be capable of providing downlink speeds of at least 100 Mbps (megabits per second), and uplink speeds of at least 50 Mbps. The government is contributing $1.35 billion to the initiative with significant amounts of private co-investment also being contributed by the Government's UFB partners Chorus, Enable, Northpower and Ultrafast Fibre.

RBI will deliver broadband to over 250,000 rural households. It will deliver broadband peak speeds of at least 5Mbps to about 86 percent of rural homes and businesses. At present, only about one-fifth of rural homes and businesses have broadband of 5Mbps. The roll-out of the RBI infrastructure began in mid-2011. Over half of rural homes will be able to choose between copper and fixed wireless broadband. It will also extend mobile coverage by 6,200 square kilometres around New Zealand.

The availability of high-speed broadband opens up the possibility of offering innovative applications to a wide cross-section of the population. Broadband deployments around the world have shown that as end-users and application developers become more familiar with the capability of broadband, they demand novel, innovative applications that specifically address their needs.

3. WHY IS WIDESPREAD BROADBAND AVAILABILITY IMPORTANT?

By providing a secure, flexible and convenient way to connect with people, broadband applications help individuals and businesses acquire information that is useful in their daily lives, thereby improving their efficiency and productivity. Numerous studies show that a strong link exists between broadband growth and rapid economic development.

In particular, over the last decade several analyses based on macro-economic models have shown that an increase in broadband penetration in a country leads to higher economic growth. For example, a 2007 study by Crandall, Lehr and Litan showed that a 10 percent increase in broadband penetration would increase employment by 0.2-0.3 percent.[1] The following year, Garbacz and Thompson found increasing broadband penetration by 10 percent would produce a GDP increase of 0.18 percent.[2] In 2009, a World Bank study conducted by Qiang and Rosotto found that a 10 percent increase in mobile penetration would lead to 1.2 percent GDP growth for developing countries.[3] And, a 2010 World Bank study found that employment can be increased by 1.8 percent for a region if it increases its broadband adoption from zero to full penetration.[4]

1. "The Effects of Broadband Deployment on Output & Employment: A Cross-sectional Analysis of U.S. Data," R.W. Crandall, W. Lehr & R. Litan. Washington DC. 2007.
2. "Broadband Impact on State GDP," C. Garbacz & H.G. Thompson, 2008.
3. "Economic Impact of Broadband," Information & Communications for Development 2009: Extending Reach & Increasing Impact. Washington DC: World Bank. 2009.
4. "Telecommunications and Economic Development," Christine Qiang, World Bank, 2010.
5. "Leonard Waverman, University of Calgary, Alberta, *Private Communications*, May 2010.

4. A HYBRID APPROACH TO MEASURING BROADBAND BENEFITS

It's well-established that access to broadband drives GDP growth. But unlike a number of previous GDP studies that adopt only a top-down approach using broad economic parameters (such as stock performance), this study adopts a hybrid approach to capture a broader picture of the economic impact of high-speed broadband.

This study, undertaken by Alcatel-Lucent's research and innovation engine Bell Labs, has two measurement approaches. First, it employs a macro-economic approach based on an input-output analysis for determining the GDP impact of the new broadband infrastructure build.

Each component of this investment creates direct economic activities in other industries, product and factor markets, and households leading to higher income and new jobs. These activities, in turn, create flows of their own that add to the additional income and jobs; the net impact on GDP is a sum of these two sets of flows.

Second, it computes the consumer savings resulting from a widespread adoption of broadband applications through a bottom-up approach using metrics that directly measure the benefits at the 'grass roots' level. For example, the benefit realised through an online doctor consultation is based on the reduction in the number of hospital visits and in expenses per visit, as well as travel- and time-related savings.

The rationale for including this 'grass roots' analysis is simple. As Leonard Waverman[5] notes, while the impact of network build can be significant, the major benefits realised from ubiquitous broadband access come from the applications being carried over the network. While each application is unique in its contribution, its economic impact can be estimated in terms of the end-user benefits (or consumer surplus) it enables. For this consumer surplus analysis, a sample of high-speed broadband applications in four sectors – healthcare, education, business services and the dairy industry – are considered.

Finally, Bell Labs undertook a sensitivity analysis to see what would happen to the total consumer surplus if they changed assumptions like speed of application adoption and total level of uptake.

The approach taken is outlined below in Figure 1: 'Framework to Evaluate Broadband-Induced Benefits'.

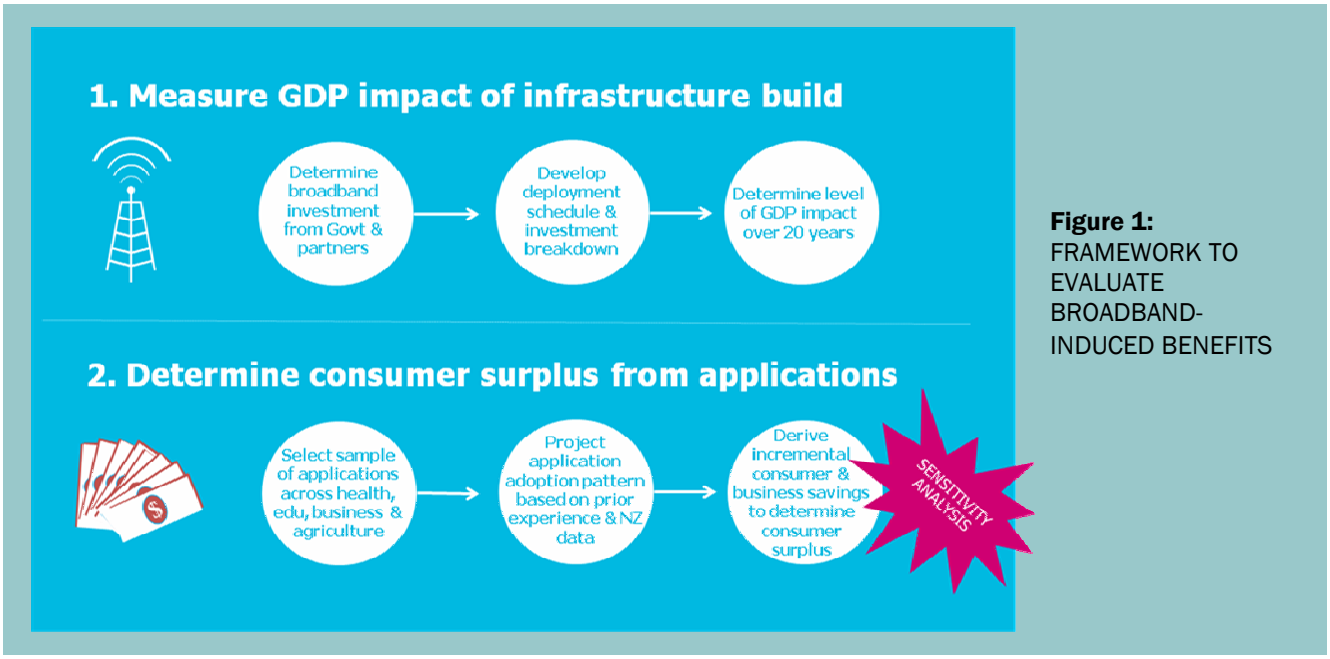


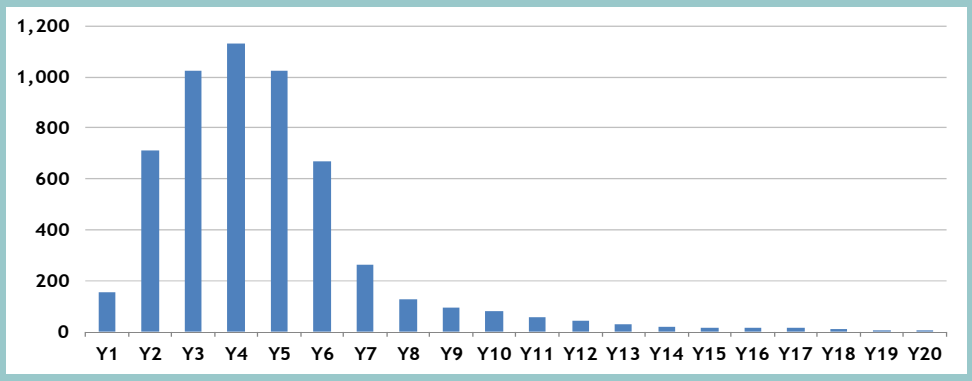
Figure 1: FRAMEWORK TO EVALUATE BROADBAND-INDUCED BENEFITS

5. MEASURING THE GDP IMPACT OF THE INFRASTRUCTURE BUILD

Given the planned investment in UFB and RBI, the network build out schedule – typically spanning multiple years – was applied to break down the total investment into yearly values and into the different industries that were the immediate recipients of this investment. This input is then combined with New Zealand's Social Accounting Matrix to determine the overall impact of yearly investment on incremental GDP using the SimSIP SAM program developed by Parra and Wodon (2009).[6] The Social Accounting Matrix captures all economic flows between various sectors – different industries, households, government, etc. of a country (or a region), as well as the trade with the rest of the world. This approach enables the determination of the overall impact of the network investment on the New Zealand economy – including the direct impact on the immediate recipient industries and the indirect impact on the other industries, households and the government.

Figure 2: 'Contribution of Infrastructure Investment to GDP' shows the resulting impact over the next 20 years. The impact is felt primarily during the first six years of the project implementation when the major investments are made. Over the period of 20 years the total contribution to GDP is estimated to be $5.5 billion dollars; the bulk of it – $4.7 billion dollars – is realised during the first six years. The New Zealand GDP figure used for this study is based on the 2010 Reserve Bank-published values.

Figure 2: CONTRIBUTION OF INFRASTRUCTURE INVESTMENT TO GDP (in millions of dollars)



6. DETERMINING THE CONSUMER SURPLUS FROM APPLICATIONS

High-speed broadband will change healthcare delivery in many different ways. Video-based health services will remove geographical barriers to healthcare. Health providers will use video-based services for clinical education and peer support. Health providers and patients will be able to share high-resolution images via the cloud. Patients will receive information to improve self-care and as part of the treatment of long-term conditions. Communities will receive improved health education information. Some of the healthcare applications considered included remote patient monitoring, online doctor visits, and electronic patient records.

The UFB and RBI initiatives will provide many new opportunities in the education sector. Schools will be able to use high-definition video-conferencing to provide new learning options for students. It could also benefit rural students who need specialist support, such as reading recovery, or who want to learn subjects that are not

6. "SimSIP SAM: A Tool for the Analysis of Input-Output Tables and Social Accounting Matrices," Jean Carlos Parra and Quentin Wodon, World Bank, June 2009.

available at their school. In the Education domain, high-speed broadband promotes services such as remote classes, technical and vocational training, skill enhancement/tutoring, and remote parent-teacher conference.

High-speed broadband can improve the quality and reach of several business applications leading to greater productivity and lower costs. Business Services can potentially cover a wide range of applications, such as communication and enterprise applications, enhanced communication services, and online marketplace.

Faster broadband service in rural areas is likely to deliver significant economic benefits to New Zealand. Food and agri-business products contribute two-thirds of New Zealand's export earnings, so the benefits of improving rural broadband are expected to be significant. Important applications in this domain include those that support farmers with information on better feed planning, soil management, fertiliser management, and others.

The economic benefits of applications translate into higher surplus – greater savings and new revenues achieved by consumers and businesses as a result of using more efficient services. Figure 3: '20-Year Total Impact on Consumer Surplus of Applications' shows how this is calculated across the four sectors.

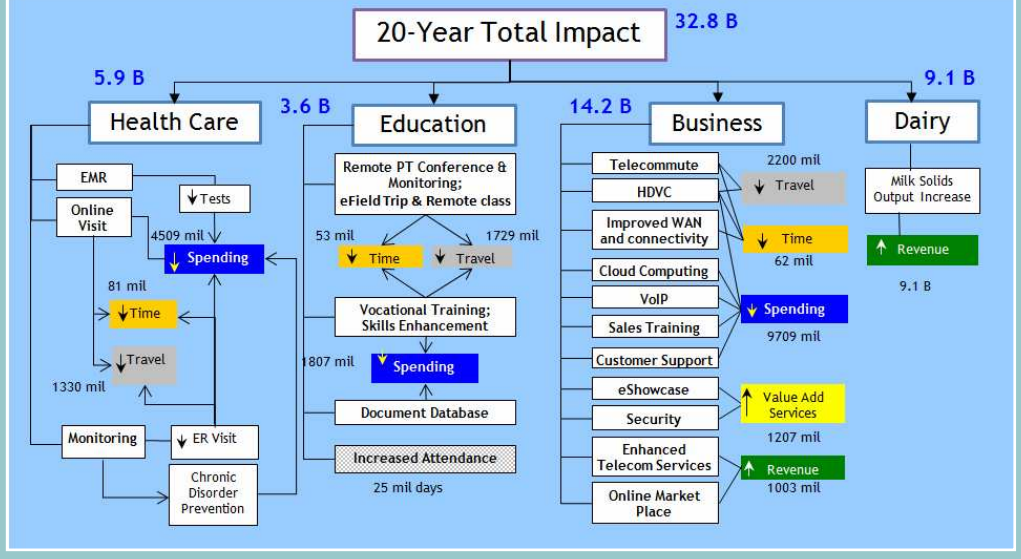


Figure 3: 20-YR TOTAL IMPACT ON CONSUMER SURPLUS OF APPLICATIONS

In the healthcare domain, the savings considered as part of the analysis included lower hospital admission and test costs, fewer emergency room visits, lower travel-related costs, lower long-term prescription drug costs, faster access to physicians and faster care delivery leading to savings in government expenditure on healthcare. The result was a $5.9 billion consumer surplus over 20 years.

In the education domain, the savings considered are those that result from lower costs of skill enhancement, as well as reduced cost of course materials and savings on field trips. The result was a $3.6 billion consumer surplus over 20 years.

Business services-related savings are achieved through improved productivity, lower travel-related costs, lower network and communication expenses, and savings (as well as new revenues) from the cloud-enablement of applications. The result in this domain was the largest – $14.2 billion.

Economic gains in the dairy industry relate to increased dairy farm productivity and were calculated at $9.1 billion over 20 years.

Annually the combined GDP impact of the build, and the consumer surplus from the applications, are worth about the same to New Zealand as the money we earn every year from our wine exports.

7. APPLYING A SENSITIVITY ANALYSIS

An important part of looking at the impact of high-speed broadband applications is undertaking a sensitivity analysis. The sensitivity analysis shows the correlation between different variables and the overall consumer surplus.

There are three key variables to consider:

1. Availability of relevant applications
2. Speed of broadband application adoption
3. Total level of broadband application uptake

It's important to remember that only a sample of applications across four sectors were considered in this study. Adding in more applications across more sectors will push up the overall consumer surplus.

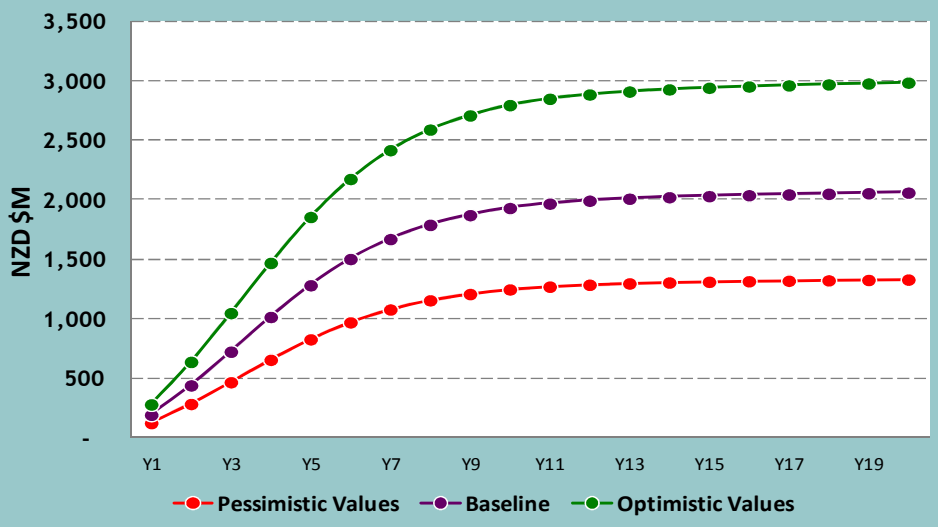
The sensitivity analysis showed that a small increase in the initial speed of adoption leads to a significant lift in the overall benefits, and the same principle applies to the total level of application uptake.

Figure 4: 'Contribution of Broadband Applications to Consumer Surplus' shows the impact on the consumer surplus of changing the speed of adoption and total level of uptake variables. The result is a baseline projection, an optimistic projection if the variables are both improved by 20 percent, and a pessimistic projection if a 20 percent decrease in the variables is assumed.

A 20 percent improvement (over the baseline) in both the speed of application adoption and the total level of application uptake improves the consumer surplus by 45 percent (over the baseline). That would mean (assuming that the same sample of applications were considered), a rise in the total consumer surplus calculated in the study from $32.8 billion to $47.6 billion – an increase of almost $15b.

The baseline assumptions used in the study are projections based on early market information available from analyst reports. The baseline 'speed of adoption' assumption is that it will take 6.4 years to achieve a 40 percent average uptake rate across all the applications considered. The baseline 'total level of uptake' assumption is a steady-state uptake rate of 40 percent.

Figure 4:
CONTRIBUTION OF BROADBAND APPLICATIONS TO CONSUMER SURPLUS



8. SOCIAL BENEFITS OF HIGH-SPEED BROADBAND APPLICATIONS

In addition to delivering the economic benefits outlined above, the uptake of high-speed broadband applications are also likely to lead to significant improvement in human development-related metrics.

The use of high-speed broadband applications in healthcare will lead to improved health management, increased life expectancy, and improved access to many health services. The use of applications in education will result in greater school enrolment and greater access to more classes, courses and study material for students.

An interesting finding of the study is that there are likely to be 25 million fewer days of missed school due to sickness and truancy, by using remote learning applications and better collaboration between parents and teachers.

Business applications that enable more people to telework are likely to improve work-life balance and can also help reduce traffic congestion and reduce carbon emissions. While this study has not quantified these benefits in monetary terms, they are nonetheless real and they contribute to enhanced quality of life for New Zealanders.

CONCLUSION

9. WHAT SHOULD WE FOCUS ON TO GROW THE BENEFITS?

To grow the gains of our high-speed broadband investments, we need to address the key variables identified in the sensitivity analysis. Without relevant, compelling and useful high-speed broadband applications, there will be no consumer surplus. The availability of such relevant and compelling applications requires innovation, incubation and collaboration between government, research and industry partners.

Before anyone can use a high-speed broadband application, they need to have a high-speed broadband network to use it on. The sensitivity analysis shows that we need to consider how we can create an early 'bow wave' of migration to UFB and RBI, accelerate application adoption, and ultimately drive the total level of application uptake as high as possible.

9.1 INNOVATE, INCUBATE AND COLLABORATE TO DEVELOP RELEVANT APPLICATIONS

Without relevant and compelling applications that use the capabilities of our new high-speed broadband networks to improve the way we do the same old things (or do new things we haven't thought of yet), the economic benefits will be minimal.

Global application development gaining ground

The availability of such relevant and compelling applications requires innovation, incubation and collaboration. Without doubt, much of this innovation will occur (and is already occurring) in the R&D labs and product development departments of global technology companies, and in the garages of start-up application developers around the world.

For example, Microsoft Office 365 is a cloud-based, pay-as-you-go service that provides end-users with access to email, documents, contact and calendars from virtually anywhere on almost any device, and can be integrated with conferencing and collaboration tools that take advantage of high-speed broadband to reduce costs and increase productivity.

LearningMate is a US-based interactive learning resources developer that has developed the GoClass application. GoClass is an e-learning application that uses tablet devices and high-speed broadband to enable teachers to engage students in new and innovative ways, provide remote access to learning materials, customise and fine-tune lesson plans in real-time, and continuously evaluate students' understanding and learning progress.

As our new high-speed broadband networks are built, many of these globally-developed applications will become available in New Zealand.

The need for New Zealand application development

But for a variety of reasons – language, culture, distance, and our legal, institutional and economic framework – many of the high-speed broadband applications that will drive economic gains for New Zealand will need to be created, adapted or incubated here. Doing so will ensure the applications meet the specific requirements of New Zealand business people, educators, healthcare professionals, farmers and consumers.

Two examples of applications developed in New Zealand for New Zealanders are Ag-Hub, an online farm management tool that allows farmers to analyse farm data to improve productivity and sustainability, and MINDA, an online and mobile tool developed by Livestock Improvement to enable farmers to improve herd management. Both Ag-Hub and MINDA are likely to become more widely used – and to deliver greater benefits to the agricultural sector – with the roll out of UFB and RBI. We need to ensure many more New Zealand-specific applications are developed to take advantage of these networks.

Many broadband applications will need to be created, adapted or incubated in New Zealand

As well as ensuring a funnel of locally-relevant and useful applications, encouraging local application development has some other useful spin-offs. It provides opportunities for local innovators and entrepreneurs to develop their ideas here and export them to the world, growing our innovation economy and future export receipts. Examples of New Zealand-developed software applications that are successfully exported around the world include Orion Health, Serato Audio Research and Xero.

Learning from other innovation incubators – IBES and Ignite

An Australian example of a collaborative approach to developing high-speed broadband applications is the Institute for a Broadband Enabled Society (IBES) at the University of Melbourne. IBES is a partnership between the University of Melbourne, the Victorian State Government and private sector partners, including Alcatel-Lucent. The institute is dedicated to innovations in products, services and end-user experiences that maximise the benefits of new broadband technologies. It incorporates a full broadband network 'test bed' and a broadband applications laboratory that provides researchers and partners with an environment to develop

new applications in education and learning, health and wellbeing, and business transformation.

In the US, the National Science Foundation has founded the US Ignite initiative to promote US leadership in developing applications and services for high-speed broadband networks. It will foster the creation of applications and digital experiences that will transform healthcare, education and job skills training, public safety, energy, and advanced manufacturing. By serving as a coordinator and incubator of this ecosystem, US Ignite aims to accelerate the adoption of next-generation networks.

Do we need replicate this kind of cross-industry collaboration in New Zealand? Alcatel-Lucent believes this is critical. We plan to expand our existing activities in this area – alongside government, universities, crown research institutes, telecommunications companies and other private sector businesses – to provide a hub for application innovation.

Alcatel-Lucent's High-Speed Broadband Lab – a 'test bed' for New Zealand application

As a key contributor to both the UFB and RBI initiatives, Alcatel-Lucent has built a High-Speed Broadband Lab in Wellington. The lab enables Alcatel-Lucent, our customers and partners to rapidly design and test new network and service concepts, speeding up the deployment of high-speed broadband networks and services.

Alcatel-Lucent is continuing to develop this lab as an industry 'test-bed' for networks and applications, and sees the potential for this facility to become a hub for wider industry, government and academic collaboration on high-speed broadband applications.

The ng Connect Program – connecting New Zealand innovators to global leaders (and markets)

Alcatel-Lucent is playing a leading role in bringing together collaborators to speed the creation of high-speed broadband applications. The ng Connect Program, conceived and founded by Alcatel-Lucent, brings together infrastructure, device, application and content companies to create an end-to-end ecosystem to rapidly develop new services and applications.

The ng Connect Program's 125 members include Alcatel-Lucent, Atlantic Records, Creative, Harman Audio, Hewlett-Packard, IMAX, Indosat, Intel, Kycera, Samsung, Sierra Wireless, and Telecom Italia, as well as developers in the education, health and games sectors. Already a number of New Zealand companies have joined the ng Connect Program, including Serato Audio Research, which creates audio software for DJs and musicians, and Solta, an Auckland-based technology innovation company.

125 members world-wide in ng Connect Program

The goal of ng Connect is to bring together innovative companies, to explore what new service concepts, business models and applications emerge when the power of networks, devices, content and software are combined.

Alcatel-Lucent launched the ng Connect Program in New Zealand in late 2011. Alcatel-Lucent sees the potential for the ng Connect Program to become a powerful framework to enable local companies, universities and research institutions to collaborate with global leaders on high-speed broadband applications, for use by New Zealand end-users and to generate export earnings.

9.2 THE FASTER, THE BETTER - ACCELERATING ADOPTION

One of the most important findings to emerge from this study is that the sooner we hit a critical mass of high-speed broadband application adoption, the greater the long-term economic and social benefits will be for New Zealand.

Supporting the network roll-out

Before anyone can use a high-speed broadband application, they need to have a high-speed broadband network to use it on. Building the UFB and RBI networks quickly is the first step to accelerating the up-take of high-speed broadband applications.

There are many things we can do to ensure the networks are planned, tested, built and commissioned as quickly as possible, such as using methods, tools and products that are proven, and ensuring training is in place to rapidly up-skill the UFB and RBI workforce.

Alcatel-Lucent is playing a key role in the UFB and RBI initiatives. By leveraging both local knowledge and international experience, we are supporting the UFB and RBI network roll-outs.

Alcatel-Lucent is also using local innovation to automate and accelerate the otherwise slow, manual process of installing, provisioning and testing a fibre Optical Network Terminal (ONT) at an end-users' premises. A team from Alcatel-Lucent New Zealand with support from colleagues in Australia has developed a smart phone application that could reduce technician support calls and reduce the time it takes to install and test an ONT by two thirds, increasing the number of ONTs that a technician can install in a day.

The rise of teleworking

Teleworking is rapidly gaining ground in places where network connectivity, cloud-based work applications and enlightened organisational attitudes allow workers to cut the ties to the office. This shouldn't come as a surprise. Teleworking can save employers on real estate and facilities costs, reduce what employees pay for transport costs, increase productivity and improve work-life balance.

According to Telework New Zealand, if 23 percent of New Zealand's working population worked from home two days a week, we could reduce our transport emissions by around 402,150 tonnes per year.

47% of employees would telework if given the opportunity by their employer

A recent study on teleworking in Michigan found that 47 percent of workers would telework if given the opportunity by their employer. The 741,000 workers in Michigan who already telework save a total of US$336.5 million every year in car running costs, and teleworking reduces carbon emissions by approximately 884.5 tons per year.[7]

Another United States case study (published by Telework Exchange) shows the potential benefits of adopting teleworking for organisations. The US Department of Agriculture estimates that it will save US$250 million a year from its teleworking programme, mainly in real estate reductions, reduced turnover of staff, less absenteeism and improved productivity.

7. "Teleworking in Michigan - Empowering Workers Through Broadband." Connect Michigan, December 2011

Can corporate-sponsored teleworking be a catalyst for accelerated early adoption?

The roll out of high-speed broadband, particularly fibre-based broadband, provides an opportunity for New Zealand to grow the number of people able to successfully telework. Fibre solves a number of the connectivity, performance and security issues that currently hinder a broad embrace of teleworking among New Zealand businesses.

At the same time, organisations with large employee bases could help accelerate application adoption and create a 'bow-wave' of high-speed broadband uptake by using UFB and RBI as the basis for large-scale teleworking initiatives.

Say, for example, that a large city council with 5,000 employees decided to subsidise a UFB connection at as many employees' homes as possible and use that UFB connection to provide a separate and secure VPN connection with low-latency, application-based quality of service. It would connect employees to cloud-based work applications such as video conferencing, virtual desktop, document sharing, collaboration tools, unified messaging and voice over IP.

Savings for the employer, gains for the rest of us

The outcome for the employer is likely to be more council employees working from home more often, leading to higher productivity and a reduction in required office space and real estate costs. The outcome for the employee is likely to be an improved work-life balance and higher work motivation, as well as an incentive to use their UFB connection for personal entertainment, health and education applications. The outcome for the community is likely to be less traffic on the roads, lower carbon emissions and – importantly in the context of this study – an accelerated uptake of high-speed broadband applications and therefore higher economic gains in the long run.

Overcoming teleworking obstacles requires leadership

To make this scenario a reality, more than just ubiquitous high-speed broadband connectivity is required. The CEOs, CIOs and CFOs of large organisations need to become champions of teleworking and communicate the value it delivers to shareholders and employees. Organisations need to have the right IT tools in place to ensure employees can be productive when they're working away from the cubicle. Firms also need to implement 'hot-desk' approaches to realise the real estate savings. And most importantly, managers need to learn how to effectively manage staff when they can't always see them.

Wanted: Big business support for teleworking

Alcatel-Lucent has 700 employees in New Zealand. While many staff still work five days a week from our offices in Auckland, Hamilton, Wellington and Christchurch, more and more are taking advantage of the company's support for teleworking. One Alcatel-Lucent employee, who supports Alcatel-Lucent customer projects around the world (and loves surfing), teleworks from home in Raglan most days, but commutes to our Hamilton office one day a week to connect directly with his local colleagues.

At Alcatel-Lucent, teleworking is supported from the top of the organisation. The company has developed a teleworking policy, with guidelines for staff and managers, and support to ensure home working environments are safe and productive. Alcatel-Lucent plans to utilise UFB and RBI to make remote working options even more available to staff.

If enough large organisations take a similar approach, together we can fast-track high-speed broadband application adoption, thereby increasing the long-term social and economic benefits.

9.3 THE MORE, THE MERRIER - INCREASING THE TOTAL LEVEL OF UPTAKE

No-one needs an economic model to know that more people taking up a useful application will result in a greater collective benefit. But where an economic model, such as that used for this study, does come in handy is when it can show how even a small lift in total uptake creates a big lift in overall economic benefit.

Ubiquity of applications

To drive total uptake benefits, relevant high-speed broadband applications need to be ubiquitous. That is, they need to be able to work on multiple devices (PCs, laptops, tablets, smart phones, TVs) running different operating systems, and across multiple access networks (fibre, copper, and 4G LTE wireless). This will ensure that applications aren't pigeon-holed as only available to those on UFB but not RBI, or only those using a certain operating system.

Policy and regulation

We need to ensure that our policy frameworks encourage aggregators of demand, particularly in healthcare and education, to use high-speed broadband applications. The Government's support for a Network for Learning in the education sector is a great example of this. We also need to ensure that sector legislation is modernised to support online transactions. In other jurisdictions, the benefits of deploying high-speed broadband have been hampered because sectoral legislation hasn't kept pace with new online approaches to transacting. In some cases, requirements to maintain paper records have meant the full benefits of broadband are yet be realised.

Addressing the needs of 460,000 small businesses

New Zealand is a nation of small businesses. According to Massey University's Centre for Research into Small and Medium-Sized Enterprises, New Zealand has 460,000 small businesses that employ fewer than 19 people. The vast majority of those employ less than five staff.

New Zealand has 460,000 small businesses that employ fewer than 19 people

When considering what New Zealand can do to grow the overall take up of applications, perhaps the most important consideration in the next few years is to ensure that high-speed broadband applications address the needs of New Zealand's 460,000 small businesses.

Xero is a great example of this. By sorting out businesses' accounting headaches using a cloud-based, software-as-a-service model, Xero have provided businesses with a reason to embrace high-speed broadband.

Alcatel-Lucent is working with partners to consider what other ways we can address small business issues via high-speed broadband. This study shows that the potential rewards for New Zealand of embracing our high-speed broadband initiatives are huge, and Alcatel-Lucent is committed to working with partners to ensure New Zealand can realise those rewards.

ABOUT ALCATEL-LUCENT

The long-trusted partner of service providers, enterprises and governments around the world, Alcatel-Lucent is a leading innovator in the field of networking and communications technology, products and services. The company is home to Bell Labs, one of the world's foremost R&D organizations, responsible for breakthroughs that have shaped the networking and communications industry. Alcatel-Lucent is committed to making communications more sustainable, more affordable and more accessible as we pursue our mission - Realizing the Potential of a Connected World.

With operations in more than 130 countries and one of the most experienced global services organizations in the industry, Alcatel-Lucent is a local partner with global reach. The Company achieved revenues of Euro 15.3 billion in 2011 and is incorporated in France and headquartered in Paris.

Active in New Zealand since the 1920s, Alcatel-Lucent is a supplier to major telecommunications companies including Chorus, Kordia, Orcon, Telecom, TelstraClear and Vodafone, as well as a number of utility providers, including Transpower and Unison.

The company has 700 staff in New Zealand, based in Auckland, Hamilton, Wellington and Christchurch. Alcatel-Lucent has a deep knowledge of the New Zealand telecommunications landscape and has the largest on-the-ground team of network engineers in the industry.

Alcatel-Lucent is the worldwide leader in fixed broadband access, supporting the largest mass deployments of video, voice and data services. Today, one out of three fixed broadband subscribers around the world is served through an access network provided by Alcatel-Lucent. Alcatel-Lucent is a worldwide leader in the deployment of GPON technology, having been involved already in more than 100 Fibre-to-the-Home (FTTH) projects. Alcatel-Lucent's GPON customer base not only consists of leading operators such as China Telecom, China Unicom, Verizon, Portugal Telecom and Hong Kong Broadband Network Limited, but also includes a considerable number of utility companies, municipalities and regions around the world.

For more information, visit Alcatel-Lucent on: **www.alcatel-lucent.com** read the latest posts on the Alcatel-Lucent blog: **www.alcatel-lucent.com/blog** and follow the Company on Twitter **@Alcatel_Lucent** or **@AlcatelLucentNZ**.

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