

TELECOMMUNICATIONS
ENABLING
NEW ZEALAND'S
FUTURE





About the TCF

The New Zealand Telecommunications Forum (TCF) plays a vital role in bringing together the telecommunications industry to resolve regulatory, technical and policy issues.

In doing so, we enable the best possible outcomes for New Zealand consumers.

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The information in this document is presented in good faith using the information available at the time of preparation (December 2016). The TCF appointed an independent research company (Sapere Group) to undertake industry research sourced from publicly available information. This is a summarised version of that research. Full details on data sources and references are listed in the full report, a copy of which is available from the TCF.

While the TCF has made every effort to ensure the accuracy of this report, it takes no responsibility for any errors or omissions in relation to the information contained herein. The TCF will not be liable to any person or organisation for any damage or loss which may occur in relation to taking, or not taking, action in respect of any information or advice within this report.

FOREWORD

An industry to be proud of

New Zealand has a telecommunications industry to be proud of.

We're leading the OECD in next-generation networks, investment and affordability. New Zealand consumers and businesses are increasingly connecting to our services, which offer significantly improved network speeds and capacity.

New Zealand is experiencing the fastest fibre uptake in the developed world, acting as a platform for other digital services and enabling an exponential economy on a global scale.

Our mobile operators have rapidly deployed 4G networks, along with the introduction of 4.5G services, enabling our early adoption culture to lead the world in services such as smartphone banking.

This access to world-class connectivity enables innovative, young NZ start-ups and entrepreneurs to take on the world from home. We're now launching "smart cities" that aim to take on the world, such as GigCity in Dunedin.

Better connectivity also means better access to streaming content, bringing more New Zealanders global entertainment, news, sport and business services, bridging the digital divide across all socio-economic groups.

In order to cope with extreme increases in demand, our networks are growing faster than ever, with investment at an all-time high of \$1.77 billion in 2015, the second-highest in the OECD.

Investment in mobile networks has increased 72%, with consumer demand for video, over-the-top content services, and constant connectivity contributing to bandwidth demand.

Cisco predicts that mobile data will grow six-fold in a five year period,

and that fixed-line services will double within the same period. This growth will require significant and continuing industry investment in infrastructure for years to come.

To help meet demand for fixed-line services, the Government has extended both the Ultra-Fast Broadband (UFB) programme and the Rural Broadband Initiative. By the end of 2024 another 423,000 New Zealanders will have access to UFB, maintaining our position as one of the most fibre-connected OECD nations.

TCF members are also investing in the Tasman Global Access (TGA) undersea cable, close to completion at time of publication, ensuring we keep pace with demand for international connectivity. The TGA cable will include strengthened links into fast-growing Asian markets, creating important redundancy and resiliency, and ensuring better connectivity with the five main international cable systems currently serving Australia.

While levels of investment continue to grow rapidly, revenues continue to fall. Consumer spend on telecommunications services declines each year, while competition becomes increasingly fierce. Separation of the wholesale and retail markets has contributed to this increased competition, as has the proliferation of "over-the-top" providers, eroding traditional revenues. All of this means consumers are getting a great deal, as the speed and capacity of services are improving, but at a lower cost to the end-user.

Continued access to world class services is now a necessity, an expectation, and a general utility for both consumers and businesses, in order to keep pace with the global



GEOFF THORN, CEO OF NEW ZEALAND TELECOMMUNICATIONS FORUM (TCF)

marketplace. Telecommunications connect and enable homes, businesses, transport, cities, and crucial services such as healthcare, and this trend is only set to increase.

Regulatory certainty is essential, enabling the industry to continue to provide world-class network services, and contribute to the economic and social wellbeing of New Zealand.

Government-led restructuring of the telco sector over the past decade has succeeded in delivering competition and innovation, and improving access for New Zealanders. However, the reality of declining industry profitability and the potential consequential impact on future investment is a concern for the industry, when the focus should be on encouraging New Zealanders to take greater advantage of the digital economy.

Overall, the industry is working exceptionally well as a whole, and the TCF is proud to be facilitating collaboration between telecommunications operators of all sizes nationwide to continue to enhance the services we provide to all New Zealanders.

Snapshot: New Zealand's telecommunications industry

\$1.77b

investment in 2015, the second highest out of all OECD countries and 5% increase year on year.



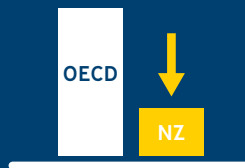
Roll out of UFB on schedule for 85% of New Zealanders to have access by 2024.

4G

Rapid deployment of 4G networks with a 72% increase in investment in mobile access across the sector in 2015.



Consumer telco costs have declined while comparable utility services continue to increase in price.



New Zealand's mobile calling plans average 7% and are up to 69% cheaper than the OECD average.



Equal highest users of smartphone banking in OECD.



Early adopter of devices – connected devices, video surveillance, tracking, healthcare monitoring.



The Internet of Things will account for 70% of all networked devices in 2020.



52% of broadband consumers are now on unlimited plans.



Fixed and mobile download and upload speeds are improving.

100Mbps >

80% of new fibre connections are now 100Mbps or higher.



Fastest fibre uptake in the developed world with numbers of new connections doubling each quarter.



The role of the TDL

Each year, the telecommunications industry is required to pay \$50 million for government-determined public good initiatives as part of the Telecommunications Development Levy (TDL).

These are initiatives which deliver benefits to small groups of New Zealanders, such as relay services for the deaf and hearing-impaired, and improvements to the 111 emergency service. In addition, the TDL is used to subsidise rural broadband infrastructure and the removal of mobile black spots.

The TCF supports these public good initiatives. There is no doubt that better connectivity for rural end-users benefits both the rural and wider economy, and that all New Zealanders should be able to access high-quality, fit-for-purpose telecommunications services regardless of their location or physical ability. However, the TCF acknowledges that achieving the goal of providing this level and reach of coverage comes at a cost that must continue to be funded from somewhere.

There is no doubt that if left to the private sector, these initiatives might not be funded, or completed as soon. That is because public good initiatives, by definition, do not generate a commercial return. There are better ways of funding these benefits, which should arguably be funded from general taxation.

The industry has total annual revenue of about \$5 billion. So it might seem that the \$50 million TDL contribution, as 1% percent of the industry's total revenue, is a small amount of money. However, in a sector which has seen a recent annual return on assets of \$100 million, the TDL represents 50% of the sector's average return.



“There is no doubt that better connectivity for rural end-users benefits both the rural and wider economy...”

As we move towards a new regulatory regime, expected to be in place in 2020, it is appropriate to think about the form, and quantum of the TDL. The TDL is scheduled to reduce to \$10 million in 2019/20 and the position of the TCF is this should happen as planned.

RSPs are well positioned to provide their customers with information to raise awareness of the contributions they make in support of public good initiatives. This could be implemented through a clear and transparent levy

placed directly on consumers, by requiring all telecommunications service providers to recover the levy in much the same way that GST is collected.

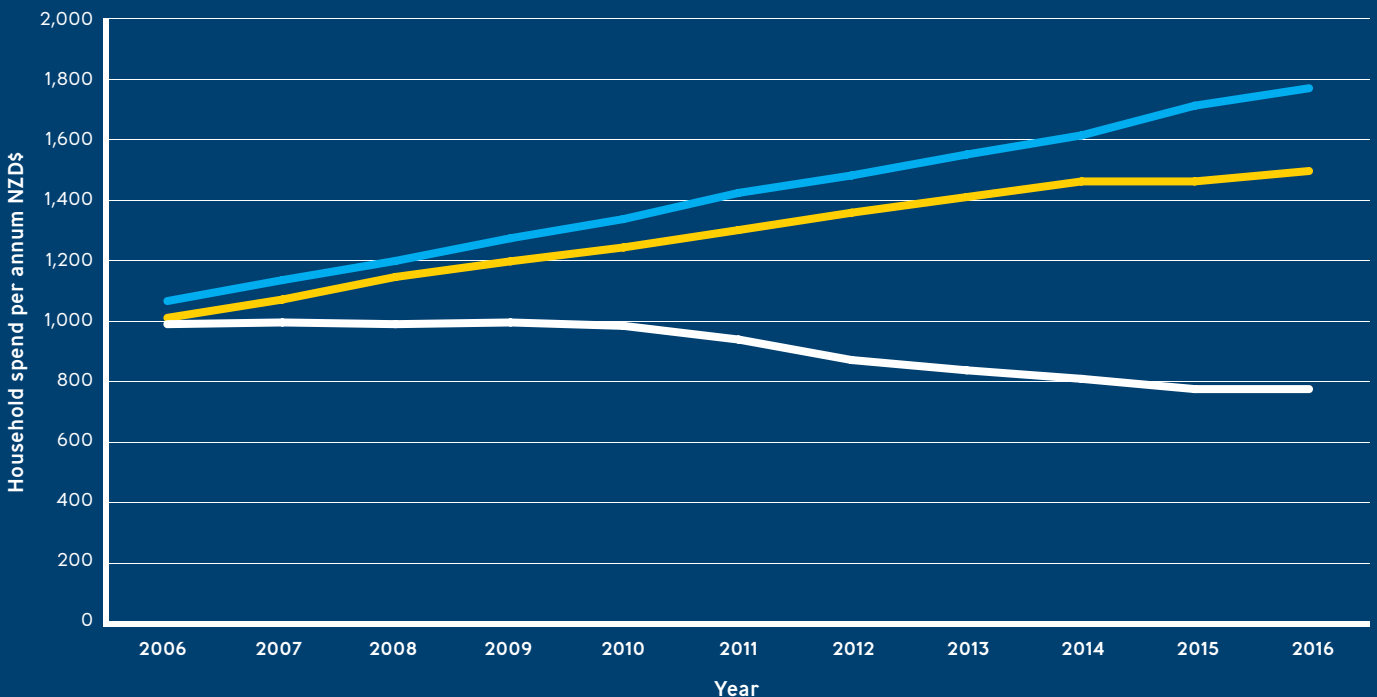
The TDL in its current form, as a tax on the telecommunications industry, has run its course, and it is time to restructure the way it is collected, and who pays the bill for the Government's public good initiatives.



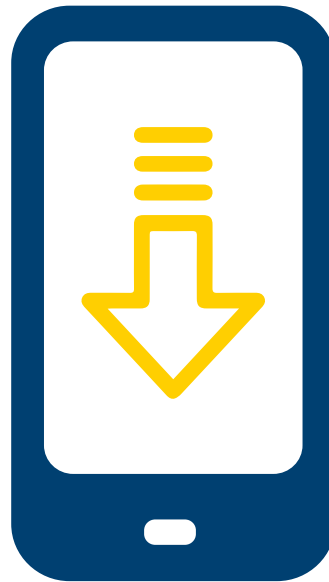
Comparative consumer costs

Across the board in New Zealand, real costs of comparable utilities for consumers are increasing over time, while the cost of telecommunications services continues to decrease, even as consumer demand and the quality of services provided are increasing.

Local authority rate and payments Electricity Telecommunication services



Our networks: At a glance



New Zealand has one of the fastest 4G mobile download speeds in the world.



Our investment rate was the second-highest out of the top 10 OECD countries which comprise our main competitors in global export markets.



We're leading the pack in the developed world in the speed of our switch to fibre-optic broadband, with the highest % increase of total connections in the OECD.



Mobile pricing continues to be increasingly competitive, with a significant improvement over 2015 bundle pricing, and 7% less than the average OECD price.

Investment and innovation: A world class network to be proud of

New Zealand has one of the highest rates of investment in the telecommunications sector in the OECD; proportionately more than other OECD countries. Since 2014 our level of investment has increased 5% from \$1.7 billion, to \$1.77 billion in 2015.

Investment by the Telecommunications industry includes a committed spend of up to \$2 billion; funding both the Government's Ultra-Fast Broadband (UFB) and Rural Broadband Initiative (RBI).

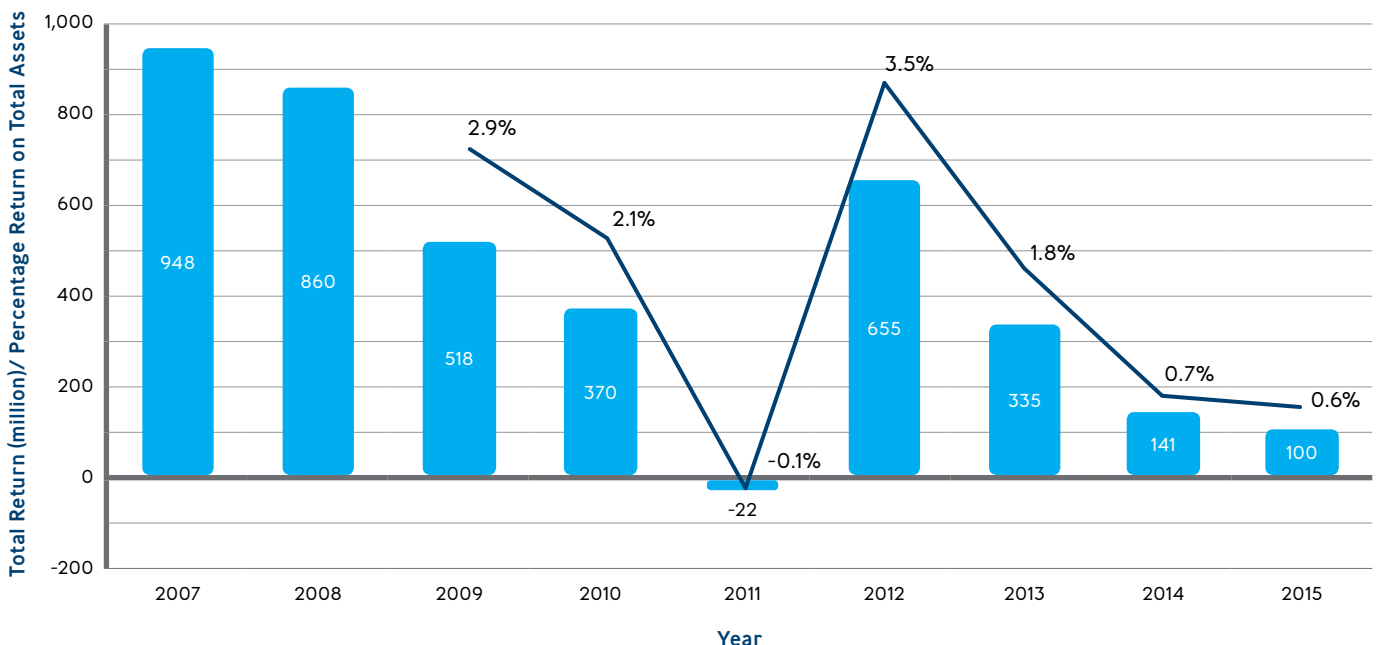
Return on Total Assets for the sector has dropped to 0.6%, while investment as a percentage of revenue has steadily increased since 2006.

New Zealand's network readiness score is well above what might be expected given our gross national income per capita, demonstrating New Zealand's networks are performing very well relative to the country's economic resources.

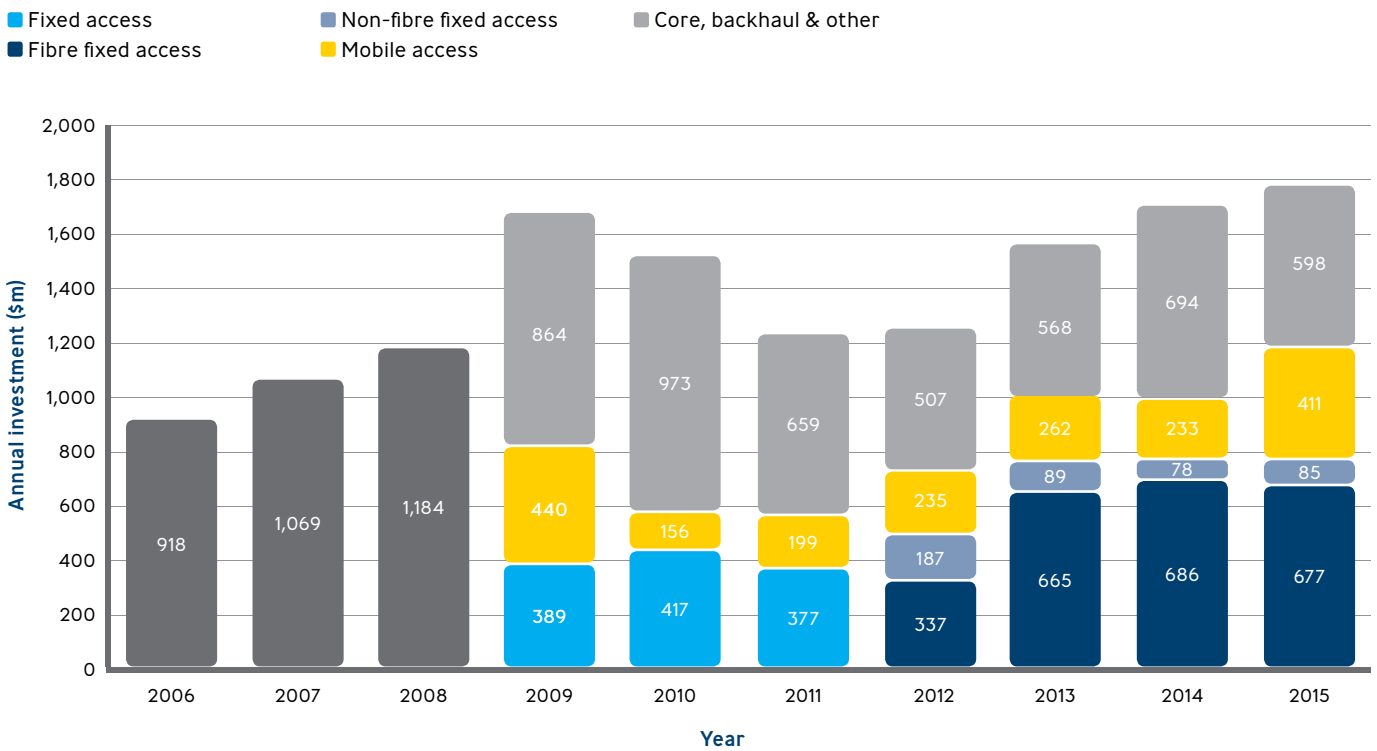


Investment vs Return on total assets

■ Surplus before tax (\$m) — Return on total assets

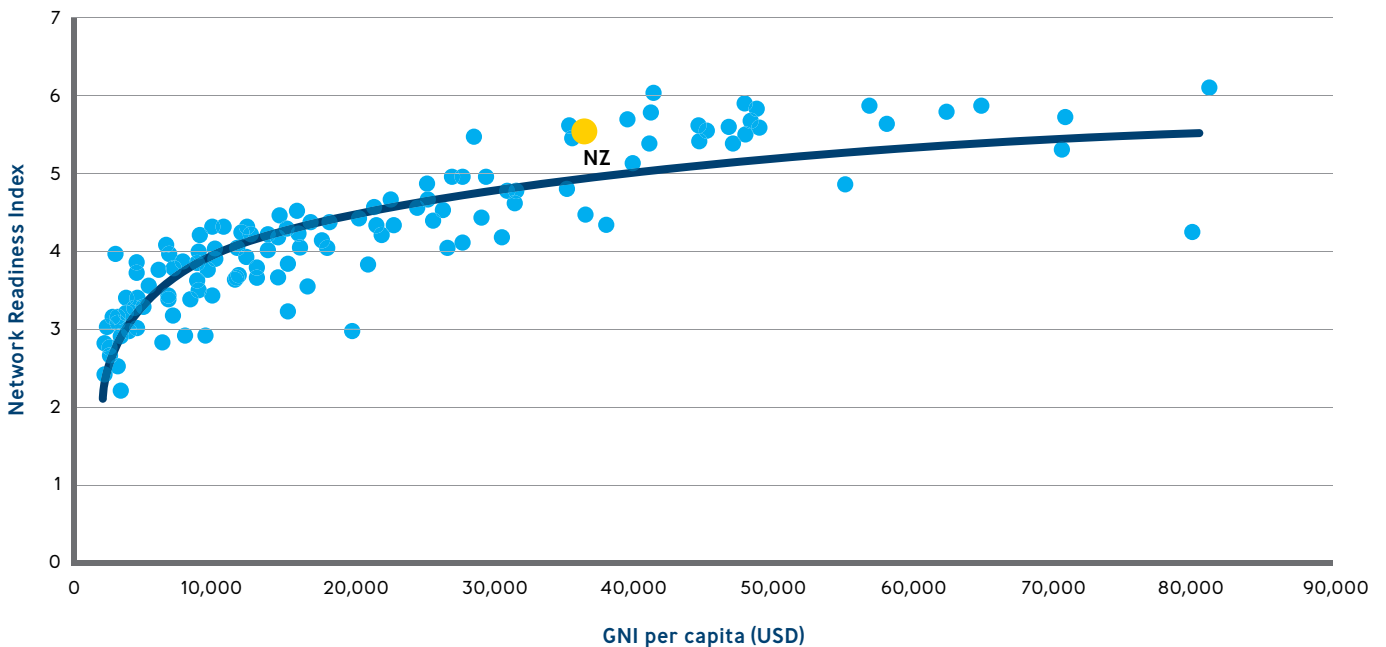


Annual telecommunications investment by type (\$m)



Network readiness index versus GNI per capita

Our Network Readiness Index score – a measure on a country’s performance in leveraging ICT to boost competitiveness and well-being – is better than most of the 143 countries in the World Economic Forum index.



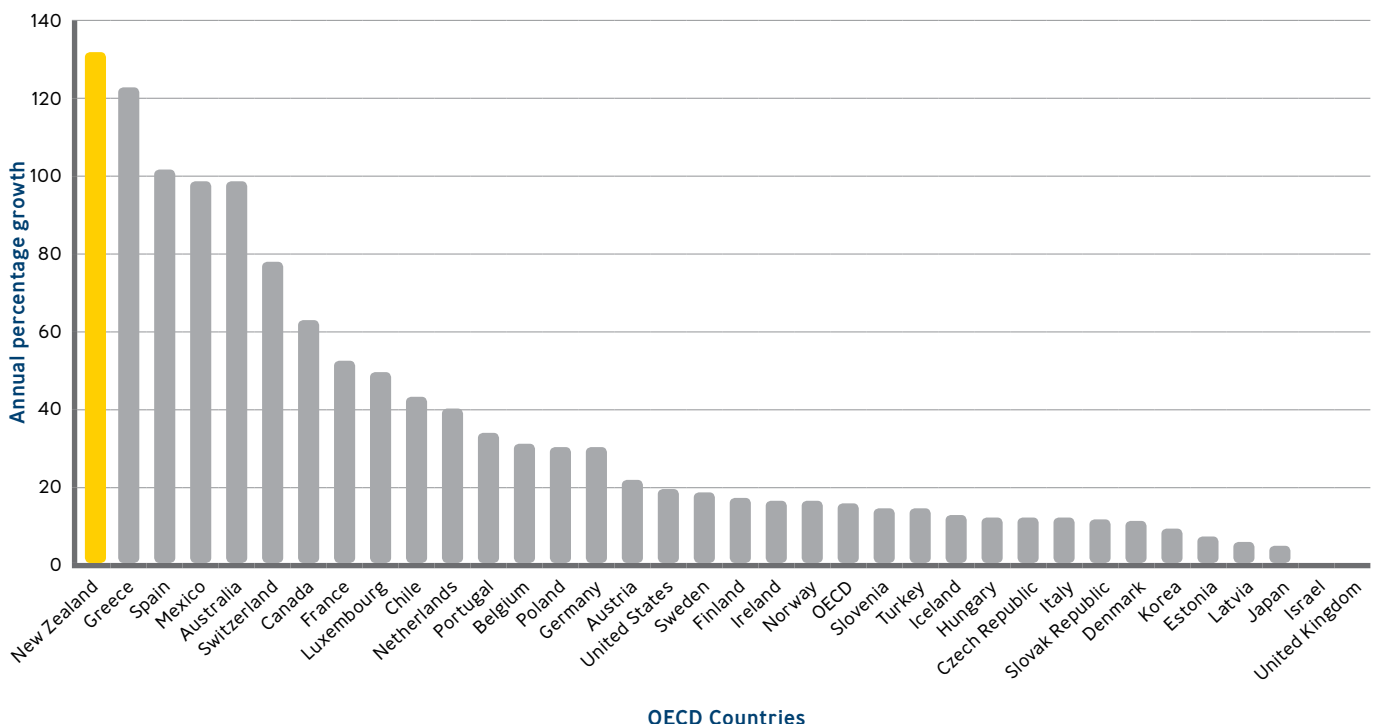
Connecting at the speed of light



New Zealand has the **fastest uptake** of **fibre-optic broadband** in the developed world.

Growth in fibre subscriptions among OECD countries year to December 2015.

Annual growth of fibre subscriptions among countries reporting fibre subscriptions, Dec. 2014-2015.



Billions of connected things

The Internet of Things (IoT) continues to explode for both enterprises and consumers. More than a quarter of all companies worldwide are now using Machine to Machine technologies (M2M), and M2M is expected to grow at an annual growth rate of 25 percent up to 2021.

In total, around 28 billion connected devices are expected by 2021. Cisco's 2016 data shows that New Zealand's usage of IoT modules is currently higher than Australia, the United States, United Kingdom, Germany and France as well as even Sweden. By 2020, IoT modules will account for 70% of all networked devices.

The demand for capacity and resilient, reliable network connectivity, will only increase as automated services become an essential part of everyday life, making our industry's investment in fibre networks vital for the economic welfare of the nation.



Improving the customer experience

The New Zealand telecommunications industry is committed to consistently enhancing the experience it provides to businesses and consumers.

Services are becoming more varied and dynamic, while costs to consumers have reduced 12% over two years, on average.

Telecommunications providers are in stiff competition, and are increasingly aware of each customer's end-to-end journey; working to improve each customer interaction as well as the products or services they provide.

The TCF has been taking leadership in the area of consumer experience and has initiated a number of projects in the last year, including:

2016/2017 Achievements

Fibre Installation – customer experience standardisation

With the maturation of UFB, providers have switched their focus from laying fibre in the ground, to understanding and improving the customer experience, from the point of sale, to the time fibre services are installed.

All Local Fibre Companies are committed to providing a consistently good installation process, along with clear and accurate information to consumers on what to expect and how to maximise their broadband performance.

Retail Service Providers also ensure customers are informed about what will happen when fibre is installed at their property, and that their customers are purchasing the right products for their needs.

Consumer-focused website

In November 2016, the TCF launched a new website with an emphasis on consumer information and educational information, that relates to the industry as a whole.

Protecting consumers from international phone fraud

The TCF has established guidelines to reduce or eliminate occurrences of International Revenue Share Fraud (IRSF) in New Zealand. IRSF covers a range of fraudulent offending including PABX hacking, VoIP hacking and voicemail hacking that can cost business customers thousands of dollars.

TCF members employ internal teams who monitor traffic and communicate with all network operators if they observe suspicious call patterns which they believe to be fraudulent, helping to prevent financial losses and business disruption for the affected customers.

Consumer videos

The TCF creates impartial, easy to understand videos on subjects such as broadband performance, which can be shared by our members and aim to improve the consumer experience.

The TCF: What we do

Number porting seven days a week

Porting numbers between providers enables consumers and businesses to keep their existing landline or mobile number if changing telco providers, within the same calling area. This enables customers' freedom of choice between providers and stimulates competition.

For added convenience, mobile numbers can now be ported seven days a week, and local numbers Monday to Saturday, reducing delays for customers moving premises.

Dispute Resolution Services

The TCF facilitates an independent service for telecommunications disputes, providing consumers with a single point of contact for industry related disputes. This service has a Net Promoter Score of 67%.

Mobile Blacklisting

Mobile providers around New Zealand work together, facilitated by the TCF, to blacklist all lost and stolen devices across all mobile networks in New Zealand.

Transitioning Services Requiring Disconnection

The TCF is developing a code which will set out an agreed industry process for disconnecting live abandoned connections at a residential premises for both fibre and copper services. This code will align to the existing customer transfer process.

By establishing an industry code for this type of scenario, telecommunications providers can provide a better customer experience when transitioning services for both departing and incoming customers at a residential property.



International Mobile Roaming Guidelines

By providing a set of guidelines on how mobile operators communicate with customers over roaming charges, the industry sets out to clarify and demystify phone charges while customers are overseas, and reduce the incidence of bill shock for consumers.

Premises Wiring Guidelines

While many businesses and consumers are connecting to faster broadband, they may not be achieving optimum speeds from their connections. A fast connection into a building can be impacted and impaired by many factors, such as wiring, materials used in the building's construction and the age and placement of modems.

The premises wiring guidelines sets out minimum standards of internal wiring for broadband installers, as well as offering advice to consumers on maximising their broadband performance.

Collaborative effort restores communications in Kaikoura

Following the major earthquake in Kaikoura last November, hundreds of personnel from the telecommunications sector banded together to restore communications in record time.



November's devastating earthquake near Kaikoura caused significant damage to infrastructure networks on the east coast of the South Island and lower North Island, and the East Coast fibre link, a significant fibre optic cable that transports mobile and fixed line data in and out of the South Island along SH1, was damaged.

Chorus, Spark and Vodafone, along with many local contractors, quickly joined forces to restore services in record time.

Although technicians began work to repair the cable in the days following the earthquake, the challenging conditions and scale of the damage meant full repairs were going to take weeks. To restore services quickly, they employed a variety of innovative solutions, getting mobile towers, broadband and landline services back to "business as usual" for Kaikoura and Waiou residents and businesses within a week.

One of the solutions involved technicians from Vodafone, Spark and Chorus establishing new diversity links by laying approximately 50 metres of new fibre cabling to connect the Kaikoura exchange to Vodafone's Aqualink cable, which is just off the coast of Kaikoura and was undamaged by the quake, providing instant network access.

As part of the East Coast fibre link repair work, Vodafone and Downer collaborated on a section of the restoration that required the use of a helicopter to lay new fibre cable over the tree top canopies, where a section of the road was suffering from repeated landslides.

Downer in its own words described the decision to use a helicopter to lay fibre cable as an "extremely unusual" way to do the job, but it enabled the teams to keep the cable away from

landslides. Before this measure, cable would be prepped for laying the next day, only to be swept out into the bay overnight by continuing rock falls.

These heroic collaboration efforts between Chorus, Spark, Vodafone and various field force operators, was fast and effective, restoring full resiliency across the three networks within a week of the earthquakes. This collaboration was acknowledged publicly as an "incredible effort" by Amy Adams, the Minister for Communications at the time of the quake.

"New Zealanders will appreciate how important communications are at a time like this as we need to know who to get to, what they need, and how to best prioritise emergency team responses," said Ms Adams.



71 Givealittle causes hosted to support the Kaikoura earthquake recovery, raising a total of over **\$350,000**.



22 joints to repair breaks in the cable to Kaikoura.



\$150,000 donated to the New Zealand Red Cross through the Vodafone New Zealand Foundation.



1,400 landline and broadband connections faulted due to power and cable disruption.



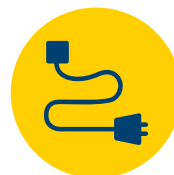
\$0 the cost for Kiwis to keep in touch with family and friends during the outage.



3,000 metres of cable laid by helicopter across three areas of fault lines.



6 days - the time taken to restore connectivity to Kaikoura.



4,700 metres of cable laid across 8 ground overlays to repair the East Coast fibre link.

What does the future look like?



NZ's fixed internet traffic will more than double by 2019.



Mobile data volume to grow six-fold by 2019.



Online viewing habits means data usage in the 'busy hours' of 8-10pm is growing at a faster rate than average.



By 2025, 99 percent of New Zealanders will enjoy peak speeds of 50Mbps.

Meeting future demand for data

An exponential wave of change has been building over the last 20 years as every improvement in digital technology and network capability has been matched – and exceeded – by a corresponding rise in demand.



Globally, every second, nearly a million minutes of video content will cross the internet by 2020.



In 2020, the gigabyte equivalent of all movies ever made will cross New Zealand's IP networks every 25 hours.



New Zealand internet traffic in 2020 will be equivalent to 156x the volume of the entire New Zealand internet in 2005.

4x

In New Zealand, Internet-Video-to-TV traffic will increase 4-fold between 2015 and 2020.



In New Zealand, internet gaming traffic will grow 6-fold from 2015 to 2020.



By 2020, mobile data traffic will be the equivalent of 18 x the volume of the entire New Zealand internet in 2005.

Telecommunications: Mega trends

Trends in telecommunications technology that are driving global growth and demand in 2017:



Internet of Things (IoT)

More and more everyday objects will be connected to the internet, enabling data collection, monitoring, process-improvement and decision-making.



Mobile Payments

Payments via smart devices will become the preferred way to shop, impacting merchants, financial institutions, and the banking system.



Video Streaming

Consumer behaviour is changing from mainstream media to content streaming. In New Zealand video streaming data consumption is expected to quadruple over a five year period.



Wearable Devices

411 million smart wearable devices worth a total of \$34 billion, such as smart watches and fitness trackers, are predicted to be sold in 2020.



App Economy

The app economy consists of businesses who operate through mobile apps. By 2020, the app economy is predicted to double in size to over \$100 billion globally.



Location-based Services

Using real-time geo-data from a mobile device to deliver targeted services, based on location and other factors, will become more prevalent.



Creating a sustainable future with RE:MOBILE

RE:MOBILE is an accredited Product Stewardship Scheme facilitated by the TCF, which recycles unwanted mobile phones to save valuable materials and energy.

Proceeds from RE:MOBILE are donated to award-winning New Zealand charity Sustainable Coastlines, who use the funds to plant trees alongside waterways, restoring habitats for native animals, reducing sediment and improving water quality.

Did you know?

More than \$2.5 million has been raised for NZ charities from the proceeds of unwanted mobile phones.

Over one million phones have been donated since phone recycling began in New Zealand.

2016 RE:MOBILE key achievements and benefits



311

public drop-off points now available
- a 66% increase



105,317

phones collected



12.5 tonnes

of potentially harmful substances diverted from landfill



4.6m

potential audience reach through promotional activities



NEW

beneficiary partnership established



2,000+

page views remobile.org.nz

In April 2016, **Sustainable Coastlines** was appointed as the official charity partner of RE:MOBILE. As of December 2016, over **\$32,000** has been donated to Sustainable Coastlines through the scheme.



The TCF comprises the following industry participants:





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