



TELECOMMUNICATIONS INDUSTRY GROUP

Treasury Discussion Paper - Infrastructure: Facts and Issues

1. EXECUTIVE SUMMARY

- 1.1. The telecommunications sector provides infrastructure that is essential for New Zealand's economic growth. It is generally acknowledged that investment in telecommunications infrastructure provides a critical platform for GDP growth both directly from investment and services in the ICT sector, and indirectly from a wide range of increases in productivity across most other sectors of the economy. Telecommunications infrastructure enables multiple-use technology, with many of the future benefits unforeseeable at the time of investment. Over the past 10 years, private sector investors (both on and off-shore) have invested over \$10 billion in telecommunications infrastructure, this is reflected by the majority of infrastructure assets in New Zealand being in private ownership. Last year alone saw \$1 billion invested on new mobile networks. New Zealand now has some of the best mobile and fixed broadband services and coverage in the world.
- 1.2. The industry is fast changing and uncertain, and at the same time is expected to see approximately \$10 billion of investment over the next ten years to support increased productivity and economic growth. This investment will be in access networks, supporting systems and in home networks. The significant level of investment made to date and the risk involved clearly shows that the private sector is best placed to deliver the required capital, and that it will continue to play a key role in providing critical telecommunications infrastructure.
- 1.3. Currently, Government's policy is clear; a commitment has been made to invest in ultra-fast broadband over the next ten years, to ensure that access is available to 75% of the New Zealand population. This is a commitment of public investment in New Zealand, and it is important that this is done in the least-distorting way to ensure that the private sector investment, which is also sought by the

Government, is incentivised. Treasury has an important role in ensuring this investment is carried out with minimal negative impact to the market.

- 1.4. The details relating to the Government's Rural Broadband Initiative and the TSO were released just prior to this submission being finalised. Consequently the TIG has not commented on that in this paper, however we intend to do so in the coming weeks.
- 1.5. The Treasury can do this by developing a robust framework for deciding when and how Government intervention is appropriate in the telecommunications sector. It is important when deciding the details of intervention to ensure that Government activity does not crowd out market initiatives and private sector investment. We believe that the Government should intervene only where the market is not delivering a desired policy outcome and, with any initiatives, the Government should seek to maximise reliance on private sector providers and minimise the impact on the market.
- 1.6. Further, the Government's National Infrastructure Plan ("Plan") should focus on removing roadblocks to the provision of infrastructure and investment by the market, and to the provision of essential Government inputs, for example, ensuring Government adopts a regulatory framework that supports investment and the timely provision of key enablers - such as radio spectrum - to the market.
- 1.7. Treasury is likely to have developed communication channels into public sector providers of infrastructure such as roads and electricity. The Treasury needs to similarly engage and work with the telecommunication industry on key issues. While we've provided some initial thoughts and base information here, the Telecommunications Industry Group (TIG) is keen to work with the Treasury to help develop a comprehensive view of the industry, a forecast of key capability and investment requirements, and frameworks relating to the involvement of Government in the industry.

2. INTRODUCTION

- 2.1. The TIG was formed in May 2009 to provide a single voice for the Telecommunications Industry and to increase the contribution of Telecommunications to New Zealand Society and Economy.
- 2.2. The TIG welcomes the opportunity to make a submission on the Treasury's discussion document Infrastructure: Facts and Issues ('the Discussion Document').
- 2.3. This submission is made on behalf of the TIG, whose members are Baycity Communications, CallPlus, Citylink, Compass Communications, FX Networks, Kordia, Telecom, WorldxChange, Vector and Vodafone. In addition, some TIG members intend to make separate submissions to the Treasury on other aspects of the Discussion Document.
- 2.4. In this submission we have focused on the seven key questions set out in the discussion document relating to:
 - a) Base Information;
 - b) Missing issues;
 - c) Decision Making;
 - d) Cross Sector Issues;
 - e) Regulatory Reform;
 - f) Aspiration; and
 - g) Link to Economic Growth.
- 2.5. No part of this submission is confidential and the TIG would be happy for it to be made publicly available.

3. OVERVIEW

- 3.1. Of all of the infrastructure sectors addressed in the Discussion Paper, the telecommunication sector stands distinct by virtue of its dynamic nature, multi-layered infrastructure and funding by private investment. Telecommunications is recognised globally as being a critical enabler for competitive economies to connect to one another, and to their own societies. New Zealand is especially dependant on a modern, efficient telecommunications sector given our geographic isolation and small population spread over a relatively large area. Telecommunications infrastructure plays a vital role in our economy as a direct enabler for domestic productivity and international competitiveness, not to mention our quality of life, and as such warrants particular attention in the Plan.
- 3.2. For the purposes of clarity, it is important at this point to define the term infrastructure as used in this submission. Infrastructure is defined as the base physical and organisational capabilities needed to provide services which are considered essential for the functioning of a modern economy and society. It may be either publicly or privately funded, however public funding in a mixed economy should only occur where the market cannot deliver, or for reasons of policy timing.
- 3.3. Unlike single service infrastructure utility operators (for example roading, water, gas), the telecommunication sector is driven by fast moving technological change. Currently in New Zealand, as in the rest of the world, the telecommunications industry is undergoing a fundamental transformation. Delivery infrastructure, the backbone of telecommunications services are shifting from copper networks to fibre networks across the world, and this has begun in New Zealand. With it, a rapid technological evolution is underway, with for example fixed to mobile convergence where traditional fixed-line voice services are being substituted with high-speed, mobile data services. This is fundamentally changing the ways in which people communicate.
- 3.4. This transformation is seeing communication broadening from people-to-people, into people-to-device (such as checking your home security camera over a mobile phone) and, more significantly, device-to-device communication (e.g. gas company computer downloads reading from a digital meter in the home). This phenomenon, known as hyperconnectivity, will fundamentally transform global communications networks, due to the change from connecting several billion network connected devices, to up to a trillion devices over the next 10-15 years¹. This wave of technology change brings enormous opportunities for innovative economies, but also significant uncertainty in terms of how the future business model will work.

¹ Source: David Clark MIT

The Importance of a National Infrastructure Plan

- 3.5. All of this means that the role and management of the telecommunications infrastructure sector has a unique place within the Plan. The TIG recognises the importance of the Plan for the New Zealand economy, which has limited available capital for infrastructure, and therefore needs to make smart, co-ordinated investment decisions. Used effectively, the Plan should provide a platform for prioritising investment choices in infrastructure, maximising their economic contribution and therefore assuring economic growth into the future.
- 3.6. Telecommunications infrastructure makes a significant contribution to national productivity, and therefore has an important place in any Plan. Recognising this, it is important to understand that the telecommunications sector has specific characteristics which are distinct to all other infrastructure utilities.
- 3.7. Roading, gas and water infrastructures typically have one layer (the road, pipe or line) which is used to provide one service (transport, gas or water). Telecommunications infrastructure is different in that it is made up of multiple layers. The interactions between these layers are complex, and they are distinct from one another in terms of their asset life and the technology used. It is important to understand these layers in the context of infrastructure investment, as they drive substantially different investment behaviour. These characteristics and complexities together with the rapid transformation and varying investment horizons need to be reflected in a Plan, as they underpin the investment and growth of the sector.
- 3.8. We recognise the Discussion Paper is the first step towards broader industry consultation which we applaud, and hope to foster further engagement through this response. The TIG and Treasury should work together towards building a shared understanding of these sector dynamics, and how to manage them effectively into a Plan to ensure that a vibrant competitive environment is achieved. We propose working together through workshops, briefings, and shared-learning sessions to build this sector knowledge and use it as a basis for the Plan. Currently there is no industry consensus on what the future of telecommunications should look like for New Zealand. This is also a welcome opportunity therefore for Treasury and the industry to work together towards identifying what New Zealand needs from the telecommunications sector in order to achieve the levels of economic growth and lifestyle that we as a nation aspire to.
- 3.9. To give an idea of the market characteristics that we see as important to understand, the following section presents a sample of what could be covered in interactions between the TIG and Treasury. This section addresses the specific characteristics of telecommunications infrastructure, the investment challenges that these present, the importance of the role of Government, and finally what we believe a Plan should contain.

Infrastructure Characteristics

3.10. As noted above, telecommunications infrastructure is different in that it is made up of multiple layers, which for simplicities sake in this submission we will roll up into three broad layers.

Backbone infrastructure layer (long-term asset life)

3.11. The backbone infrastructure of a telecommunications network is the primary physical asset. For fixed line communications, this is the physical copper and fibre connections. For mobile communications, this is the core radio network and the physical cell tower sites. This infrastructure provides the platform on which the technology and service layers reside, and has the longest asset life, typically 15-20 years.

Access Node infrastructure layer (mid-term asset life)

3.12. The access nodes are the enablers of telecommunications infrastructure. This layer uses the infrastructure backbone and enables it to be used for the transporting of voice and data. In fixed line communications the enablers are the electronics (data links) which transmit the voice and data. In mobile communications, the access node layer is the network which is built on the physical sites, such as the 3G, HSPA+ or LTE cells. This layer is characterised by much faster evolution than the backbone layer, and typically the asset life is around 3-15 years. LTE or 4G, as an example was already being marketed by equipment vendors at the same time as many international mobile operators were only just rolling out 3G. In fixed line, in the last 10 years dial-up internet equipment usage has declined to 20% of its peak, Telecom has deployed four generations of DSL technology, and is now starting deployment of GPON fibre access equipment.

Service Layer (short-term asset life)

3.13. The service layer is the technology which provides the voice and data communication services. It provides both essential communication services such as fixed-line voice, and more discretionary services such as instant messaging, video calling and so on. It is characterised by rapid product evolution, and discretionary services typically only deliver returns for anywhere between 1-3 years before becoming obsolete.

Investment Challenges

3.14. This multiple-layered infrastructure and services structure drives complex investment behaviour. The usable life of the infrastructure assets, or the period in which a return can be generated, varies significantly. Coupled with this, each layer does not remain static, but is continually undergoing technology evolution. In order to remain competitive, this often results in operators replacing assets on

each layer in an uncoordinated fashion. These varying investment horizons for different parts of the infrastructure make investment a challenging undertaking.

- 3.15. The specific characteristics of the backbone layer provide a unique challenge for investors. The infrastructure is built for use by multiple technologies, many of which won't be predictable at the time of build, but evolve over the infrastructures usable life time. Given that the use is not entirely clear when the investment is made, there is a higher associated risk profile.
- 3.16. This lack of predictability means that unlike the other infrastructure sectors, it is not always possible to forecast future services which will emerge, let alone the demand for them. This obviously makes investing a challenging exercise in the market. When it is unclear which technology will emerge as a dominant platform, typically telecommunications companies will invest in a number of potential technologies to increase the chances of backing the winning capability. This can be a costly exercise when technologies fail to take off - it is the anecdotal observation of the TIG that of all funds invested in the market, one third will fail to provide forecast returns, one third will deliver to forecast, and the remaining third will exceed forecast return on investment. For a sector that requires considerable infrastructural investment, this is obviously relatively high risk compared to other infrastructure.
- 3.17. In summary, the investment environment for telecommunications infrastructure is characterised by multiple layers, rapid transformation, varying investment horizons and unpredictable demand curves at the point of investment. Investors must be tolerant of these higher risk levels, and cognitive of the complexities this sector presents.

The Role of Government

- 3.18. Due to these investment challenges, TIG sees the Government having a pivotal role in fostering the sector to be attractive for private investment. The major infrastructure transformation we have outlined will require both onshore and foreign investment. Therefore it is especially important that New Zealand is seen as having a predictable, consistent and efficient regulatory regime, where returns are not unduly at risk from sudden rule changes.
- 3.19. If the telecommunications sector in a country is characterised by unpredictable Government intervention, and an uncertain regulatory framework, then it is likely this could exceed the risk tolerance of most foreign investors when coupled with an already complex industry environment. In a worst case scenario, having high industry environment risk coupled with perceived high political environment risk could lead to a reduction in available foreign capital. The danger here is that it could result in under-investment in the sector overall, leading to sub-standard telecommunications infrastructure which in turn would reduce the overall national product.

- 3.20. Coupled with an efficient regulatory landscape is a rational investment framework for public funds. Given the complexities the industry faces in predicting emerging technology, we consider that it is best left to private investment with market expertise to take the risks. If experienced industry players take the risk of losing up to one third of funds through investing in the wrong capabilities, then this only underscores the difficulty Governments would have in selecting investments which generate appropriate returns. We believe those investors that take the higher risks in infrastructure technology are entitled to a higher return when they are successful. This level of risk we consider is unlikely to be appropriate for taxpayer dollars.
- 3.21. However, Governments can have valid reasons to encourage investment in infrastructure which will benefit the nation, such as healthcare, telecommunications and roading. We believe Treasury can play a lead role by developing a robust framework for deciding when and how Government investment in a mixed market environment is appropriate. The TIG believes that investment of public funds should be made only where there is a clear gap between what the market is delivering, and policy outcomes the Government is seeking. When such a gap is identified, and investment of public funds is sought, only those that offer the greatest increase in overall productivity for the funds invested should be selected.
- 3.22. Where the Government decides to intervene, it is important that this is undertaken in a way that minimises impact on the market. Section 6 (Decision Making) addresses principles for how intervention can be managed to achieve this.

The National Infrastructure Plan

- 3.23. We believe that understanding the interaction between the industry, investors and the Government is important in building an effective Plan. As mentioned previously, the TIG, the wider industry and the Treasury should work together towards understanding these dynamics. A well-thought out Plan should be the result of collaboration between the wider industry and Treasury.
- 3.24. We believe the Plan should be used to serve a number of important objectives. These are centred around setting efficient policy and facilitating investment in the sector.
- 3.25. To address some of these purposes, the Plan should create a framework that allows both market and Government policy objectives to be achieved without creating conflict. It should also be used as a tool to promote co-ordinated policy across Government which is flexible and efficient, providing the best opportunity for policy objectives to be met while maintaining incentive for private investment. This should specifically drive policy to support investment in infrastructure, by identifying critical enablers that are needed for the provision of infrastructure,

(such as Digital Dividend), and remove any roadblocks or restrictions which are hampering investment or growth.

3.26. Furthermore, we believe Treasury could use the Plan to promote forward looking policy in response to the rapid transformation of the industry environment. This should encourage the government departments to be pro-active in establishing the operational settings needed to facilitate a competitive industry, and therefore attracting investment in infrastructure.

3.27. The Plan for telecommunications infrastructure will look fundamentally different to other infrastructure sectors. The TIG believes an effective Plan for telecommunications should contain:

- a) An outline of the aspirations that the industry and Government have for telecommunications infrastructure;
- b) A snapshot of current telecommunications infrastructure available in New Zealand (excluding services);
- c) A forecast of key capability requirements and planned investment by the industry;
- d) A detailed description of the specific attributes of the telecommunications market structure which shape infrastructure investment and can be used as a basis for policy making decisions. Specifically it should recognise:
 - the infrastructure characteristics that are unique to telecommunications;
 - the investment dynamics which these characteristics drive;
 - the importance on foreign investment in the industry;
 - the speed of transformation in the sector and the importance of allowing the free flow of capital and innovation; and
 - the competitive environment.

3.28. Using the Plan in this way should build the basis for the best possible telecommunications infrastructure which can provide the greatest increase in our national productivity.

4. BASE INFORMATION

- 4.1. In order to build a comprehensive knowledge of the telecommunications sector as part of a Plan, ongoing engagement will be needed between the industry, Treasury and Government. Obtaining improved base information for the sector would be one of the prime objectives of working together. As the previous section indicates, the dynamics of telecommunications infrastructure determine that there are significant amounts of base information to be considered in a Plan. It should be shaped by the agreed objectives of the Plan, and used to support those objectives.
- 4.2. The members of the TIG have collectively invested over \$10 billion into the New Zealand market over the last decade. Rather than try to address the significant volumes of base information that this has generated, the TIG proposes that workshops with Treasury be undertaken to develop the required data. This will result in information that is relevant, accurate and understood by all parties.
- 4.3. However, we would like to take the opportunity to highlight two of the most important investment exercises in telecommunications infrastructure which are underway, mobile and fibre.

Mobile Networks Infrastructure

- 4.4. The transformation from traditional fixed-line voice services into high-speed mobile data is well underway in New Zealand. Over the last year alone the TIG estimates that in excess of \$1 billion was invested in mobile networks in New Zealand. Three independent mobile networks now span the country, and mobile connections are currently more than double the number of fixed connections. All of this has been achieved through private investment.
- 4.5. And this investment is set to continue, with the rollout of 3.5G, or HSPA+ already underway. This investment will provide customers with improved mobile broadband speeds of up to 21 Mbps across mobile networks. It is a stepping stone as part of the evolution towards 4th generation mobile networks, or LTE. LTE will be a step-change for mobile data, with the potential of up to 100 Mbps broadband speeds enabled. Already even higher speeds are being trialled by the network vendors. It is a key enabler for the transition into fixed-mobile converged networks. Rolling out LTE will again require significant investment, in greater levels to the 3G deployments. Industry analysts are forecasting phased investment in LTE to be underway by 2012. This investment path will be dependent on a satisfactory outcome to the digital dividend spectrum allocation, and on an efficient regulatory regime creating a favourable investment environment.

Fibre Network Infrastructure

- 4.6. Investment in fibre network infrastructure is already well underway in New Zealand, with over 20 providers managing fibre assets around the country. For example, Chorus alone manages a network of over 23,000km of fibre and growing. We estimate that in excess of 35,000km of optic fibre has been laid throughout New Zealand.
- 4.7. There is also significant competition in the fibre sector, particularly in the urban and main population centres of New Zealand. Appendix 1 shows the fibre providers throughout the country, indicating the level of competition that is occurring.
- 4.8. Investment in this sector is only growing. For example Chorus has completed nearly one third of a 3600 whisper cabinet roll out, bringing FTTN to streets and communities throughout New Zealand. This infrastructure roll out is available to all service providers in the industry via regulation of access to the unbundled local loop,, and as a result already 50% of connections have access to broadband services with speeds of 10-20 Mbps, increasing to 84% when the roll out is completed in 2011. The evolution of FTTN is also underway, with investment in the next phase, fibre-to-the home (FTTH), ramping up. Already new subdivisions are being built with FTTH available.
- 4.9. Investment in these two key infrastructure assets (LTE and FTTN) underpinning the telecommunications sector is growing, but it is also vulnerable. How LTE and FTTH will relate together for example represents a risk that one investment may prosper at the expense of the other. The business case for FTTH is yet to be proven commercially, as is the demand². Returns from investment in this infrastructure are uncertain and carry risk, and it is important that the Government recognises this fragility. Investors have proven willing to take those risks in environments where there is regulatory certainty and rational public investment.

5. MISSING ISSUES

Layers 4-7 the Value layers of the Telecommunications infrastructure

- 5.1. Although much discussion is focussed on the “physical” network layers 1-3, the upper layers 4-7 are equally as important to the Plan in that they are fundamentally what people pay for. From these layers come the services that

² David James, Ovum, 16 September 2009, “Does government have a role in next generation access.”

create value to customers and are fundamentally what TIG members are providing to their customers.

- 5.2. In the past the killer application for telecommunications was voice calling. This is what our industry was built on. Now the killer applications are fast evolving and too many to count. The services have been separated from the network and the geography.
- 5.3. A significant trend is the evolution to a global service model where services are disaggregated from the network layer and delivered globally i.e. Google, Flickr, Facebook, Skype etc. The TIG is committed to ensuring that content and services do not all end up being delivered from overseas markets, since with the content and the services goes a significant part of the revenue. The TIG does not want to see a New Zealand telecommunications industry that is relegated to merely providing the pipes. The revenue from the layer 4 -7 services provides the incentive to continue investing and further developing the national infrastructure.
- 5.4. The TIG proposes that Treasury develop tools to track and advise Government investments in Telecommunications to prevent these investments from unnecessarily accelerating this global trend and further driving service revenue offshore.
- 5.5. The Government also has a key role in fostering the skills and supporting startup businesses in this cloud computing environment. The Government working with TIG and other industry organisations such as NZICT can develop and drive a strategy that turns this tide of value and content being delivered from offshore. In addition the TIG proposes that the Government consider tax breaks as incentives for Research and Development conducted in New Zealand as a further incentive to keeping content and value creation within New Zealand.
- 5.6. As well as the skills and business incentives focus, the TIG proposes that New Zealand takes leadership in some of the merging services environments. Areas such as;
 - a) ENUM - The mapping of PSTN numbers into Domain Name Services;
 - b) IPV6; and
 - c) Cloud Computing.
- 5.7. These are all areas where New Zealand has the capacity to take leadership positions globally that will help drive New Zealand to lead innovation in services and content creation.

6. DECISION MAKING

6.1. With the volume of infrastructure investment required to move the telecommunications sector forward, sound decision making is of critical importance. As a default position, the TIG believes that where a market exists, competitive services will be delivered. As previously stated, there is an important role of Government in fostering an attractive competitive and investment environment, and providing an efficient regulatory framework. Further, it is recognised that there are some specific circumstances where an outcome the Government is seeking is not being delivered by the market, or is not being delivered as fast as the Government would like. Seeking an outcome related to social inclusion would be an example of such a policy gap. In these circumstances investment of public funds is warranted. Outlined below are some concerns that members of the TIG have with regard to public investment in a private sector, and recommendations on how it could be managed to ensure positive growth for the market as a whole.

A framework for rational investment of public funds

6.2. As this submission highlights, the telecommunications sector is particularly vulnerable to market distortion. It requires investment in infrastructure with high sunk costs and uncertain returns, and therefore carries high risk in comparison to other infrastructural spend. Therefore to reduce the risk of inadvertently creating investor disincentive, the TIG recommends a framework be followed for public fund investment. By following such a framework, we believe confidence can be given to the market that the investment decisions will benefit overall sector growth.

6.3. A rational framework to manage public investment decisions should address the following questions in order to reduce the risk of adverse market effects:

- a) Is the identified capability aligned with the Government's infrastructure policy?
- b) Are there alternative means to public investment that could enable market delivery of the required capability, such as removing regulatory roadblocks or other market distortions, or providing tax incentives in the time frame that the government is seeking and will the industry make binding commitments as an alternative to public investment?
- c) Is the investment appropriate in the context of existing markets and infrastructure investors?
- d) What are the available options to minimise adverse impacts on existing infrastructure investors and risk of other economic distortion?

- 6.4. Of particular concern to the TIG is that any Government intervention should not provide disincentive for private investment in the sector, which would ultimately lead to a reduction in overall productivity. Given the relatively high risk of investing in telecommunications infrastructure, investors are especially sensitive to perceived market distortion. Investment decisions with public funding can potentially do more harm than good.
- 6.5. To highlight a particular concern of investors that has been voiced to members of the TIG regarding Government investment in our industry. Investors consider there is a risk of conflict of interest, in that the Government is essentially both the investor and the regulator. The Government can instil confidence in the market by providing certainty of the regulatory regime when Government intervention occurs. This is in the Government's interest when seeking partners for Public-Private investment partnerships. It would also serve to allay investors' perceived fears that Government is able to react by changing the rules, e.g. make what was a purely wholesale service into retail.
- 6.6. Government transparency, consistency and predictability in both policy and regulatory decision making will enable the market to build in potential public investment into their own investment plans. Transparency will help lessen, although may not entirely remove, unintentional undermining of private investment. This will also help provide certainty for any investors who chose to engage in a public-private partnership with the Government. Key factors in decision making for public investment in which the market is interested include:
- a) An international best practice investment decision framework be followed, such as the United Kingdom (UK) Treasury's Green Book ROAMEF investment model;³
 - b) Rigorous cost/benefit analysis: assessing the costs and benefits of public investment options, taking into account the Government's own tolerance for risk, the required returns, and investment time period;
 - c) Realistic consideration of what returns the Government require on their investment. If the market has not already invested in the capability, then it follows that the returns do not justify the investment. Therefore if the Government is choosing to invest in the capability, it too is unlikely to garner the return on investment in dollar terms. Therefore there must be a public benefit or social good delivered to justify the investment, rather than just purely commercial returns;
 - d) Infrastructure investment with public funds should be driven to select investment opportunities which offer the greatest increase in productivity for the public funds invested;

³ Refer to Appendix 2 of this Submission.

- e) That additional Governmental infrastructure expenditure is well coordinated with existing and planned infrastructure capital, otherwise it is likely to strongly provide disincentive for further investment and create uncertainty in the market; and
- f) The ownership model that Government wishes to use for investment, e.g. outright ownership, public private partnership and so on.

6.7. The key point is that where there is an effective market in operation, Government intervention is only likely to be beneficial where the market has not, and cannot of itself be expected to make the efficient investment. In such circumstances, Government intervention may well be best delivered through an appropriately structured public private partnership with market participants. The TIG is preparing studies of further regulatory frameworks that can be evolved to improve the environment for investment and promote this initiative. We will be submitting these in future papers.

7. REGULATORY REFORM

7.1. While the Discussion Paper indicates that no more specificity or certainty about future investment will be provided by Treasury than is already provided by sectoral plans⁴, we consider that Treasury must play a key and objective role in seeking to ensure that other parts of Government do provide up front guidance and a consistent approach to investment incentives and the regulation that affects those incentives over the life of the 20 year Plan. As the Discussion Document rightly notes, investment and pricing respond to market signals. The attraction of investment in New Zealand is informed by the regulatory environment. At a time when New Zealand is competing internationally for capital and across industries, best practice regulation requires:

- a) well designed and prescriptive legislative frameworks (against which accountability and measurement can occur);
- b) institutional design to support best practice implementation of the policy within those frameworks; and
- c) regulatory decisions that are well informed, predictable and the least intrusive if they are to stimulate ongoing investment whilst meeting the policy objectives in the Telecommunications Act.

⁴ Page 3 of the Discussion Paper

- 7.2. The regulatory landscape plays a major part in providing certainty for investors. As previously discussed in this submission, the telecommunications industry is currently undergoing a fundamental transformation which will build the basis for carrying the sector into the 21st century. As mentioned previously, in order to attract the volumes of capital required for this transformation, both foreign and local private investment will be needed to meet the sector's infrastructure objectives. The basis for attracting investment lies in the predictability of the economy being invested in, primarily in relation to returns. Therefore it is of vital importance that the regulatory regime in New Zealand sends the right signals of certainty and predictability to investors, creating the environment where the capital required to keep the country's telecommunications infrastructure globally competitive is readily available.
- 7.3. The regulatory framework can also be used to actively encourage investment. If there is Government concern that the market is under-investing to achieve an infrastructure objective Government wants, then an effective path to address this is to increase expected investment returns. There are a number of methods that can be used to encourage investment this way, such as reducing costs, fostering a stable market and reducing risks. Regulation affects all of these, and therefore an efficient regulatory framework will help set these parameters correctly. The evidence is clear that regulatory change and uncertainty reduces investment, and with it the ability to achieve the Government's policy objectives.
- 7.4. To this end, any regulatory reform should be based on a well-designed and consistent framework. The following attributes which are drawn from international best practice underpin world class regulatory regimes:

Clearly Defined Accountabilities

Government, regulators and the industry all need to understand their roles and accountabilities in the sector.

Transparent Objectives

Certainty around the objectives of Government regulation in the sector promotes a more predictable investment landscape for the industry. Well defined purpose statements from the Government guide both regulators and the industry.

Sparing use of regulation

This principle ensures a disciplined approach to regulatory intervention, ensuring well thought out and well communicated regulation is implemented. Intervention

should only occur where there is a clearly articulated problem, and the benefits outweigh the costs. This also reduces investment uncertainty for the market.

Industry-led Solutions

In keeping with a bias against regulation, an efficient regulatory framework should encourage working with the industry to create solutions as a first resort to addressing sector shortcomings.

Merits Review

The TIG is in the process of considering the use and structure of merit reviews to support the Commerce Commission in improving regulatory decision making. We will be producing a paper on this topic in the coming weeks.

Regular Reviews of Regulatory Framework

Ongoing, regular assessment of regulatory objectives, market interventions that have occurred, and changes in market and competition conditions all ensure that the regulatory framework remains relevant and efficient.

Commitment to de-regulation

An ongoing commitment of Government to minimise market intervention and regulatory burden.

Consistent Legislative Framework

The regulatory framework should be underpinned by a well-designed and consistent legislative framework.

A case study to highlight the benefits of an improved legislative framework is presented below.

4th Generation Wireless Services (4G)

- 7.5. Over the next 5 years there is another expected wave of mobile technology which will deliver very high data speeds to customers. This technology will deliver peak download speeds of 100 megabits per second and peak upload speeds of 50 megabits per second.
- 7.6. This significant shift in mobile technology is starting now with early deployments in the USA and Japan happening this year.
- 7.7. New Zealand will require new and upgraded networks to remain competitive with the rest of the developed nations. The productivity and societal gains of ultra-high-speed wireless broadband are compelling.
- 7.8. To ensure the billions of dollars of investment that are required can be made is a key task. Several issues must be addressed:
 - a) Suitable bandwidth within the 700 Mhz spectrum must be made available as this will be the key internationally recognized frequency range for 4th Generation networks. Close engagement between the Telecommunications Industry and the Government to ensure the spectrum is structured efficiently is also critical; and
 - b) to deliver nationwide 4G will require significantly more cell sites than today's GSM and UMTS networks (approx 2500 existing sites), potentially between 50% and 100% more cell sites will be required to deliver complete service.
- 7.9. To date in New Zealand very little co-location (sharing) of masts has occurred, due primarily to the small size of New Zealand masts compared to most markets throughout the world. For example, in European countries such as Germany and Holland, the most common antenna height distribution is in the 25-30m range, whereas in New Zealand, this is typically 10 metres lower at 15-20m. This exceptionally low tower height has been largely driven by requirements of the RMA which limit the height and size of masts. The lack of co-location, and the generally lower mast height leads to unnecessary proliferation of masts. At an average cost of \$250,000 per site this additional 2,500 sites equates to \$625 million to acquire and build these cell sites. In addition with network site acquisition in New Zealand typically taking 2 to 3 years, this massive site acquisition program would require several years lead-time before build could really start.
- 7.10. Significantly increased numbers of cell sites may also lead to increased public concern.
- 7.11. If higher cell sites (25 meters to 30 meters) were permitted then co-location could occur and LTE networks could be built without significant further site acquisition.

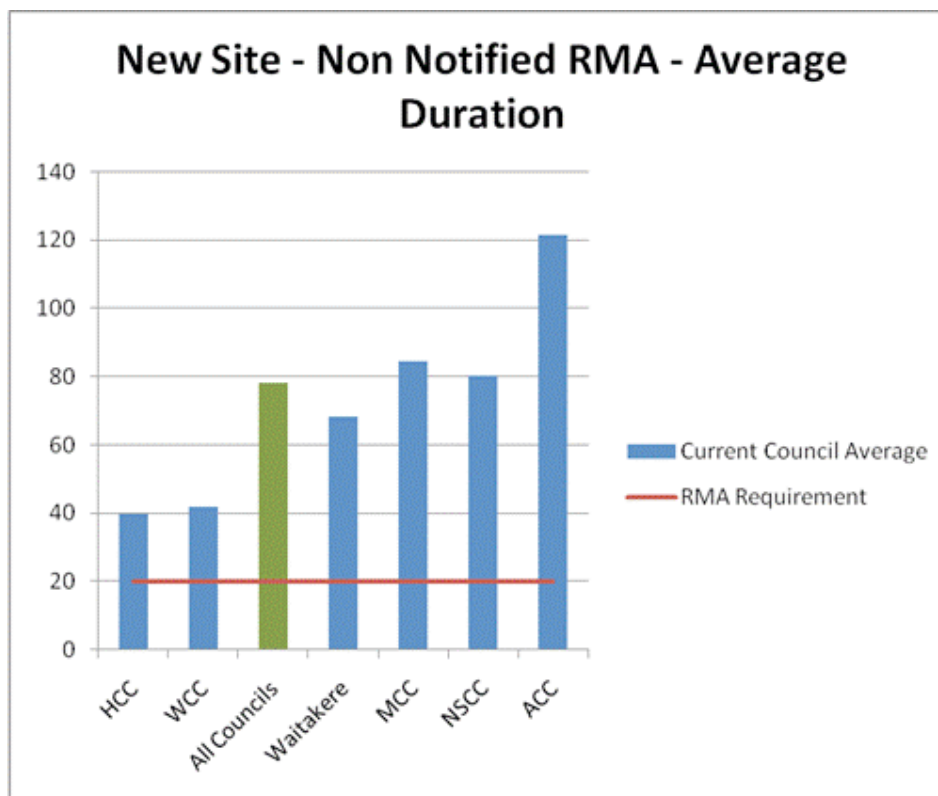
If consent was streamlined to enable larger towers to be built on existing sites through a national environmental standard, then the number of new sites could be reduced, and approximately half a billion of unnecessary cost and years of delay could be avoided.

- 7.12. We believe there is no reason the allocation of the 700 Mhz spectrum, along with the band plan should not to occur as early as next year. This will provide the certainty needed to enable mobile operators to commence more detailed planning for next generation infrastructure investment, and significantly encourage the building of this key next stage for national wireless infrastructure.
- 7.13. In addition such an approach would also enable significant 4G build involving co-location on masts and ensure a low barrier for competition in the fast evolving mobile space.
- 7.14. With these actions the Government could help the Telecommunications industry ensure New Zealand was at least keeping pace with our major international markets.

Other costs of building networks

- 7.15. The TIG estimates that compliance and uncooperative authorities drive a 5% increase in cost and lost opportunity over what is practically achievable in New Zealand. Each year with Investment of over \$1 billion this equates to \$50 million of wasted capital.
- 7.16. An example of just one area of these additional costs is set out below. The RMA requires Councils to process non-notified applications within 20 working days. This table shows the results for the last 6 years of average, best and worst Councils for incurring delays on the Telecommunications Industry. The information in this table demonstrates the real delays suffered by the industry due to local authorities acting outside of Government guidelines.

Current Performance



7.17. The industry loses significant amounts of capital per day of delay (due to lost opportunity, resources used, re-design and build costs due to unpredictability) this chart demonstrates how fundamental this issue is. In many cases investments have not been made due to the delays and costs incurred. Total suffered delayed days for just non notified consents on new mobile sites (over Government required period) for 2008 are estimated to be 4,000 days. The TIG estimates the cost to the industry was in excess of \$20 million in 2008. The TIG is preparing an economic analysis of the data to provide Treasury with details on these costs, which it will provide in the next few weeks.

7.18. The TIG welcomes the Government's initiative in tackling this area as part of the RMA reform process. The TIG intends to publish this table, and update it to track improvements and efficiency in the costs of dealing with Government authorities over consent.

7.19. The Crown can significantly assist in further reducing these costs.

7.20. Key areas of action are:

- a) Improved access to crown land for telecommunications infrastructure i.e. Motorway corridors, roads, rail and roof tops of Government buildings;

- b) A New NES that permits reasonable changes (adding antenna, extending tower height, further cabinets etc);
- c) Appoint “Owners” in councils and authorities for telecommunications planning and consent;
- d) Requirement that with any new developments of greater than 50 lots the telecommunications assets are included, i.e. land for cell site, access for cables, land for cabinets;
- e) Rights to have wireless infrastructure treated in the same way under the Telecommunications Act 2001 as lines companies are, in particular having an automatic right to erect towers and add mobile antenna; and
- f) Development of a universal “causer pays” principle to apply to infrastructure providers, where all stakeholders (including Local Government Authorities and national roading agencies) that create costs for other providers through their activities fully pay for those costs (e.g. where network assets or equipment needs to be moved to make way for widening a road).

8. ASPIRATIONS

- 8.1. The TIG believes that the New Zealand telecommunications sector should aspire to be a leading innovator and platform for economic growth within the New Zealand economy.
- 8.2. Our sector innovations should enable other industries to compete and prosper in both national and global markets. The film industry is an example of a New Zealand sector that is now competing successfully on the global market thanks to innovative telecommunications solutions delivered through investment of existing market participants.
- 8.3. The TIG also believes that this industry, under a favourable commercial investment environment, will deliver new, compelling and competitive telecommunications services that will improve the productivity and lifestyles of all New Zealanders.

In line with our earlier points on rapid change in our industry, service levels can evolve rapidly to meet customer demand and competitive pressure and may not be conducive to any predefined long term benchmarking objective. Rather the TIG would prefer to understand the outcomes the Government wants to achieve and to define the role we can play as a vital part of New Zealand’s social, cultural and economic community.

9. LINK TO ECONOMIC GROWTH

- 9.1. Links between Telecommunications Investment and Economic growth are hard to quantify or demonstrate.
- 9.2. However there are arguably very large gains that have been made to productivity through telecommunications. i.e. the introduction of the mobile phone in the 90's, Broadband in this decade and the evolution of mobile data are all step changes which have resulted in very significant productivity gains. A study by US Telecom⁵ shows that investment in broadband and related information technology in the USA has driven 1/3 or more of the productivity growth of this decade. The ongoing productivity impact on GDP growth could exceed \$200 billion annually. In New Zealand, estimates from similar studies range from \$1.4 billion to \$4 billion.
- 9.3. The TIG supports innovative public-private partnerships focused on the objectives of social inclusion and demand generation that seek to address the unique challenges our nation faces in ensuring that broadband's opportunities are available to all New Zealanders.
- 9.4. Such partnerships will need significant measurement to ensure that Government action does not distort an effective private market. The telecommunications industry is a complex fast moving market - which is not well suited to public investments. Measurements and process such as we raise in answer to section 3 of the Discussion Paper are required to ensure that such partnerships are effective and non discriminatory.
- 9.5. An example of where such public Private Partnership is being done well is in the UK within the framework of the Digital Britain Initiative. This strategy is to develop Britain as a post industrial economy through initiatives in the interconnected issues of, Broadband infrastructure, Broadband Relevance, Skills Development, Affordability of Computers in Homes and online government.

The TIG looks forward to further engagement with the Treasury to develop the telecommunications component of the Plan. In the meantime, any enquiries with respect to this submission should be made to Rob Spray, Chief Executive Officer, TIG, 021 648715 or via email at robspray@tig.org.nz.

⁵ <http://www.digitalpathway.org/images/program.pdf>

Fibre Infrastructure Providers in New Zealand

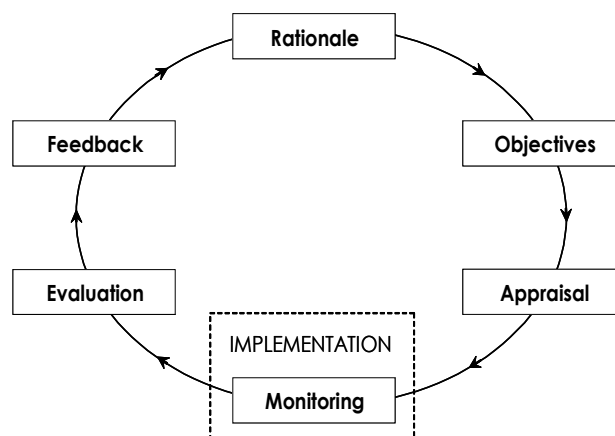
Region	Provider	Network infrastructure
Nation wide	Telecom New Zealand Ltd	Fibre, copper, microwave radio, mobile telephone, Ducts
Nation wide	Transpower	Fibre
Northland	Northpower	Fibre Ducts
Auckland	Telstra Clear	Fibre Ducts
	FX Networks	Fibre
	City Link	Fibre
	Vector	Fibre Ducts
	Counties Power	Fibre
Waikato	Velocity/Hamilton Fibre Network	Fibre Ducts
	Telstra Clear	Fibre
	FX Networks	Fibre
Bay of Plenty	Telstra Clear	Fibre
	BOP LASS	Duct
	FX Networks	Fibre
Manawatu	Digital Nation/Inspired Networks	Fibre
	FX Networks	Fibre
	Telstra Clear	Fibre
	Powerco	Duct
Hawkes Bay	FX Networks	Fibre
	Telstra Clear	Fibre
	Unison	Fibre
Wellington	City Link	Fibre
	Telstra Clear	Fibre Coaxial Cable Duct
	FX Networks	Fibre
	Smartlinx 3	Fibre
	Vector	Fibre
Nelson	Network Tasman	Fibre
Marlborough	Network Tasman	Fibre
	Telstra Clear	Fibre
Canterbury	Telstra Clear	Fibre Coaxial Cable Duct
	FX Networks	Fibre

Region	Provider	Network infrastructure
	Enable Networks	Fibre Duct
	Christchurch City Council	Ducts
	Electricity Ashburton	Fibre
Otago	Aurora Energy/Flute Network	Fibre Ducts
	Telstra Clear	
Southland	InverNET	Fibre Duct

Appendix 2

The ROAMEF model of investment as used by the UK Treasury provides a useful example of an investment framework. It serves as an analysis tool for making public investment decisions, including the preparation of business cases for the public sector. The UK Treasury Green Book is available at:

http://www.hm-treasury.gov.uk/data_greenbook_index.htm



ROAMEF model of investment in from UK Treasury Greenbook.

- R – Rationale
- O – Objectives
- A – Appraisal
- M – Monitoring
- E – Evaluation
- F – Feedback