Telecom's submission on the Commerce Commission's NGN Discussion Paper

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EXECUTIVE SUMMARY

1 Telecom welcomes the Commission's interest in Next Generation Networks (**NGNs**) and the opportunity to shape the Commission's role in relation to NGNs through engaging in the NGN Study. Given the importance of ultra fast broadband services to economic growth, and the need to encourage investors to build the necessary supporting infrastructure, it is appropriate that the Commission stays abreast of developments in relation to NGNs.

2 This submission provides Telecom's feedback on the Commission's discussion paper dated 24 December 2008 (the **discussion paper**). We have provided some overall comments as well as answers to the Commission's specific questions.

3 At the outset it is important to point out that Telecom and other providers have already begun NGN deployment. As associated issues have arisen we have worked through them as an industry. We have established consultation processes. These have proved effective methods of addressing issues, and accordingly we do not see any immediate need for Commission's intervention.

4 Instead, the Commission's role at this time should be to:

(a) Ensure that it understands the changes through all relevant value chains (including the impact of convergence and access to content); and

(b) Develop and commit to clear principles to guide when and how regulatory intervention will be assessed and may occur in the future.

5 While the Commission has proposed some draft principles in the discussion paper, we think these should be enhanced. We therefore propose some regulatory principles that we think the Commission should adopt, in line with international best practice and the need to provide sufficient certainty to encourage efficient investment.

6 We also note that in this submission we use the generic term NGN to refer to both the access or core networks and in reference to the wider market transition, as appropriate in the context of the particular Commission question. We refer the Commission to our earlier submission[1].

[1] Telecom New Zealand Ltd "Response to Commission Questionnaire – Commerce Commission NGN Study", 26 September 2008.

SECTION ONE: INTRODUCTION

7 The infrastructure build needed to provide ultra fast broadband services requires significant investment. The large investment required, the current economic climate and the uncertainty associated with the roll out of new services, makes it more important than ever that there is certainty in New Zealand's regulatory environment. Only with consistency, predictability and certainty, will the investment needed be encouraged for the long term benefit of New Zealand end users.

8 The uncertainty of demand for the services provided over NGNs, and therefore of return on investment, is well recognised internationally. There are significant changes occurring in the market and it is not clear how those changes will play out. Accordingly, it is difficult to provide definitive answers to the questions the Commission poses in the discussion paper. In a number of areas, no one yet knows what the future holds, in terms of viable investment and expected returns.

9 Telecom has taken real steps already towards NGN. We have developed NGN capability and service plans, and have deployed fibre in some areas. Attached to this submission in Annex 1 are maps available on the Chorus website, highlighting fibre existing in the North and South Islands. The Chorus website also provides more detailed maps for various geographic regions. We have also annexed the Auckland maps, as an example of the fibre roll-out in a metropolitan area.

10 Essentially, Telecom's network currently comprises 20,000km of fibre optic cable nationwide, including local fibre networks in most towns and cities, connecting over 5000 business nationwide. Fibre to the Node (**FTTN**) will add an additional 2500km of fibre, and our new Wideband Code Division Multiple Access (**WCDMA**), over 600km more – greater than the distance from Cape Reinga to Bluff. Telecom is already building fibre to the home in commercially viable greenfield areas.

11 We also understand that other operators are undertaking, or have plans to undertake, their own NGN deployments. Some of this information is available on the website www.broadbandmap.govt.nz .

12 In the course of this deployment, the industry has been dealing with the issues raised by NGNs together – a good example is the work being done on IP Interconnection. We consider that industry self-determination is the right approach at this time. The industry should be given the first opportunity to consider NGN issues, and it is best placed to do so. However, we recognise the need for, and encourage, the Commission to stay abreast of developments in this area.

13 In these circumstances the Commission's best course of action is to:

(a) Ensure that it understands the changes through the value chain (including the impact of convergence and access to content); and

(b) Develop and commit to clear principles to guide when and how regulatory intervention will be assessed and may occur in the future.

A renewed focus on content

14 We support the Commission's initiative to inform itself more fully on what is occurring in the market, and the impact this might have on the Commission's role.

15 The discussion paper focuses on network access and this, in part, is likely to reflect the degree of Commission understanding of the market through its current regulatory role. At the infrastructure level, the study could usefully consider the importance of associated systems for customer and service management. It is these new systems that allow for new converged services that will offer significant benefits to consumers.

16 The Commission also asks a number of questions relating to changes to the value chain and content markets. We agree these issues are important to understanding the market. As noted in our previous submission[2], to understand all the changes occurring in the market the Commission needs to take a fresh approach and consider all parts of the value chain, including the relationship between infrastructure and content providers.

17 It is the changes to the value chain and the way parts of the value chain interrelate that determine the nature of the market and investment. For example, the NGN transition has resulted in the separation of - from a technical and economic perspective - underlying network infrastructure from content and services delivered over that infrastructure.

18 In the PSTN world, access and calling were not separable, and calling revenue directly supported investment in access infrastructure. In an NGN environment, however, network and services can be separated and, in most cases, provided by different parties. The implication is that new commercial arrangements are required to fund infrastructure investment and potential for competition concerns relating to access to content and possible use of market power in content markets[3]. The global nature of content markets and firms creates specific issues for the market and regulatory environment.

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[2] Supra n1.

[3] J.A. Hausman, "Valuing the Effect of Regulation on New Services in Telecommunications," Brookings Papers on Economic Activity, Microeconomics, 1997.

19 Looking forward, the Commission can usefully focus on the role of content in driving the market, sustaining efficient investment, and the regulatory and commercial models required to deliver benefits to New Zealanders. IPTV and video-on-demand are key services for driving broadband take up and investment. Current vertically integrated broadcasters, with existing broadcasting/distribution platforms, control premium content in the New Zealand market and have limited incentives to push content on to new broadband platforms.

20 It is unlikely that service providers will be able to deliver such services without a change to the market structure that currently determines access to that content in New Zealand. A careful examination of this issue has to recognise the significant commercial impacts that any change could bring, and in particular, reflect the interests of those creating content.

Regulatory principles

21 The principles of international best practice regulatory design are well recognised in OECD countries and were the subject of discussion in the MED review of the regulatory control provisions of Parts 4 and 4A of the Commerce Act last year. Those design principles apply equally to the design and implementation of regulation.

22 In the UK, those design principles have been given effect to through greater legislative guidance than in the New Zealand regime and, additionally through a commitment by Ofcom to specific regulatory principles that will guide decisions on *whether* and *how* to regulate[4]. The importance of upfront clarity was also the subject of discussion during the Commerce Act review last year and New Zealand's legislature has also moved to legislating in favour of up-front guidance.

23 The rationale for this is certainty. Best practice regulatory regimes promote consistency and predictability to meet this aim. In today's environment, as overseas, the transition to NGNs demands that potential infrastructure investors can derive certainty from a settled, clear regulatory environment that will encourage efficient investment for the long term benefit of end users.

24 A commitment to regulatory principles, and clear articulation of them, will enhance any certainty derived from a purpose statement, and further contributes to certainty. This in turn encourages investment.

[4]Ofcom's Regulatory Principles, see http://www.ofcom.org.uk/about/sdrp/

25 Where there is significant regulatory discretion (as there is in the New Zealand Telecommunications Act 2001 (the **Act**) as compared to other regimes), there is an increasing need for more granular up-front principles. That need for certainty is heightened in the telecommunications industry as the transition towards NGNs proceeds.

26 The decision whether or not to recommend regulating an additional service has centred on addressing the questions:

(a) Is competition in the market for the service limited?

(b) If competition is limited, then is the benefit of regulating access terms to the service greater than the cost of regulation?

27 A feature of the investigations into whether or not to regulate access to services is that these services are established and mature. This has meant that there is substantial historic evidence on the demand of the service, the cost of supply, and market structure. In the case of the NGN, the market is neither established nor mature, therefore there is not the historic evidence on demand, supply or structure, on which to base a recommend regarding regulation.

28 The fact that the NGN is neither established nor mature also means that there are significant commercial risks in investing in the platforms that build up the NGN, as it is unclear whether demand will allow sufficient returns to cover costs. This uncertainty is further exacerbated by the possibility that access to elements of the NGN might be regulated at some future point in time, thereby truncating returns.

29 Furthermore, if the uncertainty regarding the possibility of regulation at some future point of time is significant when the decision to invest is being made, then risk may deter investment. The resulting detriment to consumer welfare can be very significant, as it may result in lower quality services or even services not being provided at all.

30 A set of regulatory principles would help manage this uncertainty. We strongly urge the Commission to develop such principles, both in respect of its general regulatory work, but particularly in relation to what can usefully be done to encourage New Zealand's NGN development. That would be the best outcome at the present time.

31 To this end, even though the UK Communications Act 2003 has more clearly prescribed purpose statements than the New Zealand Act, and the UK regulator has also adopted a set of regulatory principles, in furtherance of certainty and accountability, Ofcom has also developed a specific set of principles relating to NGNs.

32 Accordingly, we welcome the Commission's mention of regulatory principles in the discussion paper. We would like to see these taken further and more closely aligned with international best practice. That is what can usefully be done to encourage New Zealand's NGN development at this stage. It would promote best practice goals and the long term benefit of end users without creating the risks that other intervention would create, and which would be premature and would potentially distort the market in the current environment.

33 In addition, the Commission should also set out its expectations regarding how a workably competitive market would operate and, where the Commission has identified a problem, its approach to key regulatory issues.

34 To be effective in reducing regulatory risk the principles must set out the Commission's objectives and likely approach in sufficient detail that industry participants can reasonably predict the Commission's future actions. Further, the Commission must show a commitment to the principles by consistently applying the principles and decisions.

35 We discuss these principles in detail, in our response to question 2 in the discussion paper (see below). However, to summarise, the Commission should a include commitment to regulatory principles that will guide future consideration as to *whether* and *how* the Commission will consider and implement regulation within the scope of the powers conferred under the Act. Those principles should include:

Whether to regulate:

(a) A focus on efficient infrastructure investment and competition;

(b) Maximising potential for innovation;

(c) Reflecting risk in returns;

(d) Providing regulatory certainty;

(e) Encouraging industry self-regulation;

(f) A bias against regulation;

(g) Undertaking a cost benefit analysis before intervening, to ensure intervention occurs only where there is a clear benefit;

(h) Intervening only where necessary – where there is enduring market failure;

How to regulate:

(i) The least intrusive form of regulation necessary;

(j) Consulting widely with all relevant stakeholders before imposing regulation;

(k) Ensuring any regulation is technology and provider neutral;

(l) Rationalising regulation to ensure a targeted, single point of regulation rather than multiple layers;

(m) Regular reviews of interventions for effectiveness, market developments and the state of competition in the markets;

(n) Preparing and committing to an explicit and detailed plan to minimise burdens; and

(o) Removing regulation as competition develops.

36 New Zealand's existing telecommunications regulatory framework and institutional arrangements are out of step with international best practice and the amendments to the Commerce Act last year. This is highlighted in our Annex 2, which provides a comparison of our framework against the UK telecommunications regime and the Commerce Act. While the Commission must operate within the framework specified in the Act today, it has a large amount of discretion. Notwithstanding deficiencies in the framework, some move towards best practice implementation can still be achieved if the Commission is willing to adopt and commit to well articulated and transparent principles. The NGN study affords a valuable opportunity to take a step back and adopt a first principles approach to the future regulatory regime, and to do so up front, to promote certainty, confidence and accountability.

SECTION TWO: ANSWERS TO QUESTIONS

Introduction

Question 1:
What are your views on the approach to development of the market framework and industry consultation that should be considered in New Zealand?

37 There is little debate among OECD countries that regulatory outcomes are second best to commercial solutions. There is a high risk of regulatory error. These risks are exacerbated where there is the uncertainty in the economic climate, technology choice and end user demand. In turn, there is increasing uncertainty for investors.

38 Many regulatory regimes are established and implemented so as to encourage commercial outcomes. There are many examples of self- and co- regulatory initiatives. The promotion of the same can also be seen in best practice approaches to regulation around the world.

39 As the Commission notes, the policy issues in the communications and content markets are currently being considered by a number of bodies. There are also initiatives under way to consider specific aspects of NGN migration.

40 In New Zealand, NGNs are already being deployed by operators, based on their individual technology approaches, albeit at a basic capability level at the moment. The real issue for New Zealand is how much will be deployed and what are the services that can therefore be sustained on the infrastructure invested in?

41 The industry has already commenced dealing with various issues as investors make plans and deploy infrastructure. In this environment, it is important that the industry is given the time and ability to work through issues and the Commission has the choice to encourage this, even within the current framework. This accords with the primacy of commercial solutions first, in line with best practice, and reduces the risks of error that regulation, and particularly premature intervention, can bring. The Commission should, of course, ensure that it is well informed through this study and stay abreast of developments, as any good regulator would.

42 The Commission's role at this time should be in promoting certainty, efficient investment and commercial outcomes. To do this, regulatory principles will create a positive effect both now and in any future work the Commission may undertake in relation to a specific NGN issue.

43 The Commission's role should not extend to industry planning, but should focus on identifying clear market failures.

Question 2:
Do these core principles provide a useful underpinning for considering NGN issues, or whether they should be modified or supplemented?

44 Telecom welcomes the Commission's openness to developing proposed core principles for considering NGN issues. While a key step forward, they need to be substantially expanded to create real value for the New Zealand environment, for the reasons outlined in our introductory comments.

45 As we have outlined in our previous submission[5], Ofcom publishes high level regulatory principles that it uses to inform its day-to-day work. In addition, it has developed a set of principles specifically to guide its work on NGNs. While it may not be appropriate simply to transplant the Ofcom framework here, we cite it as an example of international best practice, and we support any steps towards a similar framework from the regulator implementing regulation in New Zealand.

Transparency of purpose and policy position

46 The Act's role is largely focused on regulating price and non-price terms for access to certain telecommunications services between service providers. The Commission is tasked with implementing a comprehensive list of these services. In addition, the Act sets out a process for the Commission to follow in order to determine whether or not to recommend to the Minister regulating an additional service.

47 In undertaking this role the Commission has a legislative purpose to ensure its actions are in the long term interests of end users. We have concerns about:

(a) The legislative purpose;

(b) The Commission's proposed principle relating to end user benefits; and

(c) The lack of clarity about the policy positions that the Commission is working towards in furtherance of the legislative purpose.

48 The legislative purpose in the Act makes no reference to incentives for efficient investment – this can be contrasted with the more prescriptive purpose statement provided by the UK Communications Act 2003, which is the framework within which Ofcom operates. Similarly the changes to the Commerce Act Parts 4 and 4A contain a purpose statement with a wider focus than that of the Telecommunications Act. We have attached a table, at Annex 2, that provides a comparison between the UK regime, the New Zealand telecommunications regime and the Commerce Act regime. While

[5] supra n1.

the Commission has no ability to effect changes to the legislative purpose of the Act, we simply note here for completeness that the current legislative purpose does not align with international best practice and the approach taken in the Commerce Act.

49 In line with this, we note that one of the Commission's proposed principles refers to preserving competition for end users in an NGN environment. The wording is slightly different from the wording used in the legislative purpose statement in that the wording in the Act is more about economic efficiency, and we suggest that wording should be used here.

50 In addition to all this, while we have the limited guidance of the legislative purpose statement, it is not clear what the Commission believes are the policy positions, both at a general level and in relation to any particular area of interest, that would meet this purpose. Accordingly, the Commission should clearly articulate the policy position it is pursuing. This would send a clear signal to the market about the Commission's thought processes, thereby providing greater certainty for industry participants.

Incentives to invest

51 We welcome the Commission's recognition of the need to preserve investment incentives. However, we think the principles should go considerably further and be more specific, if any future NGN regulation is to have a real ability to encourage efficient investment.

52 We note that Ofcom has specific principles in relation to NGNs, which include[6]:

(a) maximising potential for innovation: the scope for innovation and differentiation is essential for competition in next generation access, and infrastructure investment is helpful in achieving this.

(b) reflecting risk in returns: anyone who makes investments in next generation access is likely to face significant commercial risks. Regulation should reflect these risks in order to provide appropriate incentives for efficient investment in the first place; and

(c) regulatory certainty: the regulatory regime should be clear and in place for a reasonable period of time, to allow investors the clarity that they need to invest with confidence.

53 We would like to see the Commission adopt similar, more extensive principles, that would provide more encouragement for efficient investment. If New Zealand is to be positioned to take advantage of the benefits that are, and will become, available through high speed broadband, it is critical

[6] Ofcom (23 September 2008) *Delivering Super-Fast Broadband in the UK – Setting the Right Policy Framework*.

that we take steps to encourage the necessary investment in NGN networks and services.

Encouraging commercial solutions

54 Recognising that the industry is best placed to make decisions in relation to NGNs and that there is a risk of regulatory error where such decisions are interfered with, we agree that industry self-determination and commercial negotiation should be encouraged unless that approach fails, and intervention becomes necessary. To date the industry has been working through NGN issues and should be encouraged to continue to do so. We set out our views on this in detail in our previous submission[7].

Bias against regulation

55 We welcome the Commission's proposed principle that regulation should only be imposed where necessary. However, this proposed principle does not go far enough to provide comfort to potential investors. Ofcom has four additional principles that we think should be added to the Commission's proposed principles:

(a) Regulator has a bias against intervention but with a willingness to intervene firmly, promptly and effectively where requested;

(b) Least intrusive form of regulation (minimum necessary);

(c) Cost benefit analysis – clear benefit before intervention[8]; and

(d) Regulator will consult widely with all relevant stakeholders and assess the impact of regulatory action before imposing regulation on a market.

56 It is important that the Commission should not intervene unless there is clear evidence of enduring market failure to deliver a reasonable level of competition and only where the benefits of intervention clearly outweigh the costs. The Commission has to undertake both a market analysis and a cost benefit analysis before intervening, to give effect to these principles.

57 If intervention is then determined to be necessary it should be the minimum necessary to address the problem. The Commission has supported this principle in its submission to the Ministry of Culture and Heritage in relation to the Digital Broadcasting Review of Regulation[9] There should be consultation to ensure the potential effects of the proposed

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[7] Supra n1, p12.

[8] Ofcom (21 July 2005) *Better Policy Making – Ofcom's Approach to Impact Assessments.*

[9] Available at http://www.mch.govt.nz/publications/digital-tv/submissions.html - see page 6-7.

regulation are fully understood. We note that in the UK, Ofcom operates under a legislative requirement to minimise regulatory burdens[10].

58 While these ideas might be implicit in the statement that regulation should be imposed only where necessary, we think it would be valuable to make them explicit. Ofcom has made these separate principles and we similarly consider that they should be distinct, clear points.

Technology and provider neutral

59 The Commission should ensure that any regulation is technology and provider neutral. That is an important principle, especially in a developing market. There is a need to avoid regulatory bias that might skew investment decisions or create other implications for end users. These principles are well recognised internationally[11], and, we note, are supported by the Commission in a submission to the Ministry of Culture and Heritage in relation to the Digital Broadcasting Review of Regulation[12].

Rationalisation of regulation

60 If regulation develops in a piecemeal way and is not rationalised, companies are left with a significant burden. A good example of this is the continuation of New Zealand's resale regime, while at the same time encouraging bitstream-based and UCLL competition. Where conditions exist to warrant the removal of layers of regulation, the regulator should proactively consider that. Ideally there should be a single point of regulation, rather than multiple layers.

61 This is also an important principle with respect to NGNs, if any further regulation is proposed to be added in the future.

Regular reviews

62 The Commission has proposed, and we agree with, the principle that regulation will be scaled back as competition develops. However, to support this there must be regular reviews of intervention and market developments and the state of competition in the markets. Without these there is no mechanism to monitor the competition to give effect to the principle of removing regulation. To date there is no evidence of this in New Zealand.

63 Further, we recommend that, if regulation becomes necessary, there should be a plan to minimise burdens and de-regulate as appropriate. This needs to be a detailed, explicit plan that the Commission is committed to. Again, this would give effect to the principles of removing regulation and

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[10] Communications Act 2003 (UK), section 6.

[11] See for example, Article 8(1) EU Framework Directive 2002/21/EC OJ L 108/33 (incorporated into the Communications Act 2003, see section 4).

[12] Supra n9.

rationalising to ensure a single, targeted point of regulation. Such a plan, and commitment to it, would go some way to providing an incentive for efficient investment in that investors would have more comfort that regulation would be reviewed and that there is a real possibility of it being removed and/or rationalised if there are several layers of regulation in existence.

64 These ideas are particularly important in a regulatory framework, such as New Zealand's, where we do not have a legislative design that reflects international best practice in terms of accountability. Best practice dictates that accountability is provided for through (a) separation of powers, (b) clear and prescriptive purpose statements from which the regulator can be measured and (c) appeal on the merits. In the absence of all of these in New Zealand, it is imperative that there is review of the intervention for effectiveness, timeliness and cost.

Other considerations

65 To support all the proposed principles and the development of future regulation the regulatory framework and institutional arrangements must also be robust. While those may not be strictly relevant to the Commission's discussion paper, we think the NGN study affords a valuable opportunity to take a step back and adopt a first principles approach to the future regulatory regime. To that end we would encourage the introduction of clear oversight and review of regulatory decisions and the effectiveness of the regulation framework – including the introduction of merits review.

Characteristics of NGNs

Question 3:
Are there additional elements that have to be taken into account when defining NGN? If so, what are the additional elements, why should they be taken into account and what impact do they have?

66 The discussion paper focuses on network elements that make up NGNs. However, the relevant elements are wider than this, incorporating both additional NGN elements such as core connectivity elements and IT systems, and the content and services provided to customers.

67 In the past, the distribution network and content (or services, applications) could not be separated. For example, voice calls and network access were provided to customers as a PSTN service. Telecommunications, data services and broadcasting all operated largely independently. In an NGN environment, however, the network and content are separated from both a technical and economic perspective. The NGN allows both traditional telecommunications and new content services to be delivered over the same network. The network and content can be provided by any number of service providers.

68 The implications are that markets and services are converging, which has been discussed at length elsewhere, and that new commercial models are required. Traditionally, service revenues, such as voice calling revenue, formed part of the revenues to support the costs of the undertaking network and access. The pricing arrangements for content to support investment in the underlying NGN networks are still developing.

69 The NGN impact will be felt right through the value chain. Therefore, it is important that the Commission develops a perspective that captures all NGN elements and wider value chain implications.

The network and IT elements

70 Although the specific network components will vary between providers and different network technologies, the key elements are generally the same:

(a) End user hardware (both equipment and internal wiring);

(b) Local access network;

(c) Backhaul and core network;

(d) International connectivity;

(e) Interconnection; and

(f) Content delivery systems.

71 Further, there is a significant component of IT systems capability that is required to deliver and manage services on an NGN. This capability provides the Next-Generation Operational Support Systems (OSS) and Business Support Systems (BSS) required to deliver converged services, service bundles, location-based services, real-time provisioning, self-service and many other aspects of NGN service that the market is being led to expect from the deployment of NGNs. Some functions such as identity and access management (authentication, user profiles, passwords and the like) are necessary to implement NGN services, and may be involved in interoperability between networks, but the systems implementing such functions are not necessarily captured definitions of NG Core Networks, as in the language used by the Commission in the discussion paper.

72 These elements have implications for interoperability, and for definition of input services and interconnection arrangements. They can impact the feasibility of providing certain types of services, or impact the complexity of certain forms of interconnection.

73 These elements are also significantly impacted by regulatory requirements relating to NGN services, network interconnection and service performance.

74 The importance of IT Systems/Support processes in delivery of services is comparable to that of the network itself, and to the implications of regulation.

75 Issues of standardisation and coordination of operational processes are currently, and will continue to be, as significant an issue for the industry as coordination regarding network interactions.

76 Telecom actively supports the work being done locally and internationally contributing to standardising these processes.

77 For the industry to have confidence in the work it is doing to develop/adopt standard OSS/BSS tools, there needs to be certainty that we are building for commercial outcomes and that late breaking regulation will not require rework or add additional layers of complexity (cost) to the work underway.

78 Attachment subsystems also warrant separate consideration. These systems provide the AAA functionality and, despite the IMS architecture, are evolving differently for different service types. Mobile is heavily reliant on an identity token (SIM) issued by the service provider. Fixed services tend to rely on a variety of credentials issued by various parties. If the access network provider does not recognise or support the attachment

mechanisms and credentials of a user attempting to connect via that network, then the NGN goal of multi-service access may not be fully realised.

Question 4:
What do you think IMS fulfils? Is it necessary, or are there other ways of fulfilling its function? What are the implications of this layer for the future of NGNs?

79 As noted by the Commission in its discussion paper, IMS is an architectural framework – a way of describing a set of functions required to provide a set of capabilities. The objective is the provision of multimedia communications services across IP networks.

80 IMS is therefore a framework to unlock the potential of convergence. Convergence is the means by which consumers might benefit from NGN through new devices and new services, with enhanced mobility and control. If IMS (or a comparable framework) determines the framework for interoperability, then it also, in turn, impacts upon the scope and extent to which converged benefits and innovation will result for consumers in New Zealand.

81 IMS is not necessary – there are other ways of describing those functions. However it has become the dominant framework in the industry for describing these functions, and therefore serves a useful purpose as a common language. Other "languages" exist, but tend to be proprietary.

82 IMS also fulfils a role of providing a set of standards for defining functional interfaces. As with many technical standards, these can assist achieving interoperability between functions provided by different vendors and operators which need to be interconnected, by again providing a common language. And again, others exist, but tend to be proprietary, and even within the standards there are multiple options which can still make interoperability difficult.

83 Even if IMS is the common language, it is not necessary for every vendor or operator to implement all the functions and interfaces defined by IMS to achieve sufficient interoperability. In fact one would expect there to be different implementations, reflecting different business strategies, services, priorities, and operational models.

84 The key impact of IMS, therefore, is interoperability. The extent to which one desires or requires interoperability of functions will influence the usefulness of IMS as a basis for industry standards supporting interoperability and interconnection. However, this does not mean that everyone has to implement "an IMS", or even something that is entirely compliant with IMS standards. It simply means that IMS can provide a useful basis for describing functions and agreeing interface standards

supporting interoperability of different operators services where it is desirable to support multimedia communications across different operators' networks.

Drivers of NGNs

Question 5:
Where and how should the balance between coverage and speed be struck?

85 Telecom continues to invest to meet future demand across both business and residential customers. These investment decisions are based on forecast demand in an area, likely services demanded by customers and cost. Our FTTN programme will deliver significant service improvement to a planned 84% of our lines. Over time, we expect that this will be augmented by further investment in fibre to the premises (**FTTP**) and, where economically rational, fibre to the home (**FTTH**). Annex 1 provides some maps showing Chorus' fibre build, including planned build.

86 Further, we are rolling out nationwide a 3G WCDMA mobile network. The network will support 3G and broadband services to 97% of the places New Zealanders work and live.

87 A number of other providers are also either deploying or augmenting NGN access networks, including Vector and Vodafone. Further market-led investment in speed and coverage will be made as customers demand new content and services.

88 The appropriate balance between coverage and speed is best determined by the market. For example, Telecom's major programme of cabinetisation, announced in late 2007, resulted from a decision process which involved choosing what was believed to be a marketable broadband speed target, establishing the envelope of capital expenditure that could be sustained within Telecom's overall capital requirements and its capacity to finance those requirements, and then identifying the coverage at the chosen speed that could be developed within that envelope.

89 However, there may be times where the roll out will depart from that preferred level. For example, if pricing has to be uniform, this limits the ability of operators to extend speed and/or coverage beyond the point where the uniform price equals average total cost. Extending speed or coverage beyond that point requires the ability to engage in value based pricing (per discussion in paragraphs 161-171 in our earlier submission). Further, as set out above, the way that regulation is considered or applied runs the risk of delaying or reducing commercial investment or resulting in inefficient technology choices.

90 Further, the Government has indicated that improved high speed broadband availability and uptake is important for its economic objectives. Public sector funding can occur in areas where the market will not deliver. To achieve the Government's goals, it is likely that a mix of speed-, reach- and service-based initiatives will be required.

Question 6:

Is industry consultation necessary on network design for NGN?

91 A number of NGNs have been and are being deployed by a number of different investors and operators on their individual technology approaches. To a great extent the design and deployment of the NGN (as a network) has already taken place, or is in advanced stage of deployment (ADSL2+, FTTN, FTTP, Ethernet Capability etc.) and is being developed with regard to international standards (Metro Ethernet Forum, Broadband Forum etc), where they exist.

92 We believe that, to the maximum extent possible, operators need to be able to make their own technology and design decisions. This is not something that should be managed centrally or regulated, as that tends to generalise technology approaches and limit innovative use of alternative technologies. However, there will be instances where it is important for some co-ordination or standardisation, for example, interconnection and house wiring standards, where standardisation benefits operators or end users. To a significant extent these industry conversations are already occurring and, where there is a need for further consultation, the TCF remains the best body for initiating discussions.

93 The existing regulatory framework places certain consultation obligations on Telecom. Telecom has Undertakings obligations to consult on the development and deployment of services over its NGN. There are further obligations to consult on the impacts to service providers on the transition from legacy services to NGN based services. This consultation is underway and is ongoing. We note however that these obligations are Telecom specific, and other service providers do not have similar obligations. To get truer service interconnection and interoperability across different operators' networks the information should flow both ways.

94 The IT systems and support processes that support the development and delivery of NGN services is an area of interest for service providers and Telecom is actively engaging with stakeholders on plans for developing the OSS and the BSS capability that will underpin the delivery of future services. Customer business requirements have been gathered in relation to B2B systems capability and further consultation will occur as these processes are developed and as they mature.

95 Consultation on the service wrap and customer experience required by service providers will also form part of the ongoing NGN consultation programme that Telecom will deliver. This ensures that the 'outcomes' (for example zero-touch provisioning or customer self-provisioning) desired by service providers are delivered, not merely the support for a particular standard or protocol.

96 Telecom's consultation relates primarily to the services Telecom provides to its wholesale and retail customers. As services develop further, we expect that other wholesale providers would need to undertake similar consultation with their customers relating to new services or changes to old services.

97 At this stage, we do not believe there is a need for additional consultation initiatives. There is already consultation or industry discussion under way on key issues. Further, the TCF provides a mechanism to launch further consultation where required.

Question 7:
How does the deployment of NGN change bottleneck characteristics?
Is access to the infrastructure still an issue? If not, what other elements could become important?

98 There is significant investment and technology development under way in both fixed and wireless NGNs.

99 We cannot assume that historical network bottlenecks will be repeated in the future. Further, changes in the value chain mean that bottleneck issues could occur in different places, for example at the content level.

Access to Content

100 Access to content online is often free and largely on an open platform. By contrast, access to content on television, particularly pay TV, is on a closed platform with limited selection, exclusive content rights to national sports, in a largely unregulated environment, and is provided by one subscription pay TV operator. To focus only on the infrastructure aspects when considering the impact of NGNs on the market would be to consider only part of the picture.

Networks

101 Concerns over network access are likely to be less evident due to the fact that customers will be able to obtain access to services over a number of different platforms. For example, in Europe mobile broadband services are already taking substantial market share. From a competition perspective, it is unclear whether access will remain a bottleneck when inter-modal competition is taken into account.

102 In any case, at this stage its unlikely that any firm views can be developed on the economics of future networks.

Question 8:
Part of the BIF is targeted at deploying open access urban fibre networks and the Government has indicated that it will set aside $1.5 billion for open access FTTH rollout that will reach 75% of the

population. What is your understanding about what is meant by open access?

103 Open access means non-proprietary (to a particular provider or, as far as practically possible, access technology) network service attachment, i.e. the systems or procedures required to enable a provider and/or end user to access a service via the access infrastructure relies on credentials and processes that are supported in commonly available generic end user devices and are not unduly restricted (for example, not unreasonably locked) by issuing network service providers.

104 In terms of NGN Access Network (NGNAN) services, open access should be defined as:

Commercial access, on a non-discriminatory basis, to the service being offered by the access provider. If the access provider offers a vertically integrated wholesale/retail service offering that includes the access service – then the access service must be offered to all comers on the same terms and conditions that the access provider consumes the service itself.

105 Open access does not mean access to the underlying network elements (for example Dark Fibre, DSL Ports, local fibre loop), nor does it mean unbundling of the service on offer. Any obligation to provide access should be at a single point depending on economics of the underlying infrastructure. .

Question 9:
What are the areas that are not likely to be commercially funded?

106 In terms of the fixed network, areas outside current planned deployment are not likely to be commercially funded. We can currently provide broadband to around 93% of customers, including upgrades to 84% of our lines through the FTTN programme and deployment of WCDMA mobile broadband to 97% of where customers live and work.

107 In general, population density (often correlated with distance from the nearest exchange facility), forecast demand and cost are the primary drivers for investment decisions relating to access network deployment.

108 Telecom has previously discussed with the industry its investment decision-making criteria in relation to access roll out and has published maps detailing the areas where investment will be made to provide NGN services[13].

[13] See, for example, the maps provided in Annex 1, and the Chorus website – www.chorus.co.nz

109 Those end users located outside Telecom's committed (wired) NGN deployment plans currently have to choose alternative service delivery platforms (Wireless – e.g. WiMax, Satellite, 3G Mobile).

110 There is no compelling commercial case to serve these customers by a wired NGN (copper or fibre) service. If it were deemed desirable for these end users to have access to these services (from a public policy perspective) then alternative remedies (i.e. targeted government funding) need to be pursued.

111 To this end Chorus is working actively with organisations (such as local authorities and other providers in partnership) to investigate opportunities to extend the footprint in areas which would otherwise not meet the business case for a commercially funded roll-out.

Question 10
What do you believe is needed to drive broadband penetration and speed in the future in New Zealand?
Do you agree that cost savings are one of the core drivers for NGN deployment in New Zealand?
How will competition enable innovation?

112 Future broadband penetration and speed will be driven by demand for new applications and content. People will demand higher bandwidth where they see a need (value) for that bandwidth. Of particular importance is the business demand. The discussion paper is limited in that it generally focuses on residential demand, which may differ from business demand. Investment decisions are driven by all demand, including business and mobile services. Business customers represent a substantial portion of overall demand for new broadband and data services. Further, business consumers tend to adopt new technologies earlier than residential consumers, and thereby provide the market forces to drive the core demand for new services and the investments they require.

Cost savings

113 There are a number of drivers for NGN deployment, including the demand for new services (discussed above) and the economic life of the existing assets, for example, replacement of assets used for fixed or mobile telephony services. Asset lifecycle is a key issue in a fixed cost business. Telecom is deploying its third generation of DSLAMs and only the last variant has been capable of multiple services.

114 Cost savings in the long term are a substantial driver for NGN core and system deployment, although we note that the impact on cost is not as direct as some suggest. At the network level, the operating costs of an IP network can be more expensive than legacy equipment for a single service like PSTN voice, but cheaper for the set of services we anticipate providing

in the future - being a mix of high bandwidth data services, voice, video and telemetry. In the past, these would all have required their own largely separate networks. Further, for incumbent operators, deployment of NGNs enables overall cost reduction through a simpler operating model which can reduce the costs of systems and processes.

115 It is really through multi-service architecture, at a network and OSS level, and business simplification that we will see real cost savings as a result of NGNs.

How will competition enable innovation?

116 It is the ability to innovate that drives sustainable competition. Innovation requires investment. In principle, facilities-based competition is the best driver of innovation as new players look to differentiate their new service from the alternatives (for example, although ADSL2+ is now the standard for most fixed network broadband, there is ongoing mobile data broadband development). This reinforces the importance of preserving the incentives to invest in NGNs.

Question 11:
Many are of the view that the pipes should be built first and services will then follow. Others believe that a lack of services and demand for broadband services are an issue. What is your view?

117 What businesses do is understand demand for services, new and old, and take informed risks to invest for innovation and new services. This is the foundation of innovation, of competition and of economic growth.

118 The level of risk that businesses are prepared to take depends on a large number of factors, including, *inter alia*, the cost of investment, real demand (i.e. willingness to pay), and price (including regulatory price setting behaviour and expectations). Telecom's investment in fast broadband is based on a view of these (and other) factors: we consider that our investment levels are significantly ahead of real demand and reflect both an optimistic view of demand growth and expectations that investment costs will be reflected in regulatory prices.

119 It is clear that service innovation is not always driven by infrastructure owners – dial up internet is a prime example, where demand for voice calls got the infrastructure in place. Better internet allows services like Facebook or iTunes to work better, but it is not just one service that drives an individual customer to get broadband. However, to the extent that the value of new services cannot be shared by infrastructure owners, the costs of new investment will not be recovered and so cannot be economically justified. In such circumstances, or where there are positive externalities that cannot be internalised by a business, there may be a role for government intervention (for example, direct subsidy).

Question 12:

Is content ownership or access to content a hindrance to the development of broadband in the New Zealand market?

120 See below.

Question 13:

How is the nature of New Zealand's subscription TV market likely to impact the development and take up of NGN in New Zealand?

121 The OECD has recommended that a key ongoing focus for officials should be to identify and remedy barriers to the development of digital content and online business, particularly impediments to competition, and to review possible bottlenecks in digital content markets and barriers to e-commerce. It is the promotion of competition that is likely to be the most effective means for growth of the digital content market.

122 IPTV and video-on-demand are key services for driving broadband take up and investment. Accordingly, the business case for further development of the broadband market is unlikely to stack up without access to premium content. Current vertically integrated broadcasters, with existing broadcasting/distribution platforms, control premium content in the New Zealand market and have limited incentives to push content on to new broadband platforms. It is unlikely that service providers will be able to deliver such services without a change to the market structure that currently determines access to content. Further, the movement of content owners in to adjacent or downstream network markets could raise competition issues in its own right.

123 Analysis of this issue needs to be undertaken with a good understanding of the commercial implications for industry participants. These are likely to be significant. It is important that the industry is able to continue to invest in both network infrastructure, and in content and applications.

Implications Of NGNs

Question 14:
Is the service scenario approach seen as a useful one for the purpose of studying the New Zealand NGN market, and if so what would be the elements of practical and relevant scenarios?

124 The scenarios chosen need to relate to the issues being considered. The scenarios chosen relate to network demand and are unlikely to inform, for example, analysis of the impact of convergence or nature of future commercial arrangements between service providers.

125 At a high level the scenarios appear a relevant viewpoint for considering network demand issues, but they are too simplistic. Each of the individual services in the scenarios in itself is quite complex. For instance, video conferencing is a complex interaction between equipment vendors developing the technology in such a way that it is compelling for end users. Video conferencing has been assumed to be the great answer for decades. ISDN (which is now being phased out) was built specifically for this revolutionary market. However the early video conferencing equipment was too expensive for a poor experience. This then has a feature/quality/price trade off – for example, Cisco Telepresence is superlative, but at $250k+ per room to set up it is out of reach of all but the largest users. Web conferencing is fairly ubiquitous but is more a novelty rather than a service a consumer would pay more per month for.

126 It is difficult to see how the Commission's scenario three for a few customers is better than scenario one for all.

127 We also note that the Commission's scenarios tend to focus on residential customers. In fact, as outlined earlier in this submission, business needs are some of the main drivers for NGN development and investment.

Question 15:
What other implications for the value chain of traditional operators and suppliers can be expected when moving towards an all-IP environment?

128 Undoubtedly value chains will collide and reform. The key challenge is to ensure that they are free to redevelop; people take on the value chains when they see a reward and regulators must not remove that reward.

129 Further, as noted above, the technical and economic separation between NGNs and content means that commercial arrangements need to change. Where once services formed part of the infrastructure needed to deploy the services, they are now separated. However, the commercial arrangements that will support network investment are only just developing.

Question 16:
What other effects on the competitive environment could be expected when rolling out next generation networks?

130 We agree with Diagram 9 in that there are impacts that potentially increase competition significantly. However, it is less certain what the impact will be for particular parts of the value chain or operators' business models.

131 As set out previously, the separation between the network and content means that competition across the value chain will be different. For example, Vodafone has moved into the fixed line business, from being a purely mobile service provider.

132 The overall competition environment will be richer, with new wireless and fibre-based networks and convergence with established broadcasting networks.

Question 17:
How do these effects influence the roll out of next generation networks and innovative services?

133 The higher or increasing investment risk is likely to slow down the roll out of NGNs. To this end, a certain regulatory environment is critical to balancing some of the risks and encouraging efficient investment. The requisite certainty is provided by a clear set of principles by which the regulator will act, if intervention becomes necessary.

Question 18:
To what extent is symmetric speed or capacity necessary to provide future services to customers?

134 Current residential access technologies are asymmetric, and this design decision is predicated on international demand for more asymmetric use of the available access resource. However, business services inherently demand a more symmetric access connection and use technologies such as symmetric DSL and P2P Ethernet.

135 We expect this application trend to continue, and think it is important to optimise the resource usage of each technology for the customer base it is serving.

Question 19:
What are the most important and significant drivers of bandwidth demand?

136 Content and applications are developing rapidly. At this stage, some of the most important drivers of bandwidth demand are:

(a) Video content in increasing resolution; and

(b) Virtualised computing – removing processing power from the premises and scaling in data centres.

Question 20:
Is a differentiation of classes of services an appropriate approach for solving QoS degradation for end-to-end services?

137 There are two aspects to prioritisation:

(a) What to do when demand exceeds capacity – choice between:

(i) Randomly discarding traffic at the congestion point; or

(ii) Admission controls – rejecting entire flows at source.

(b) If the decision is made to reject flows at the source, then the issue becomes which flows should be admitted ahead of others.

138 This is an area in which there is still much debate, and in relation to which international standards bodies are struggling to find agreed and effective resolution. This reinforces the fact that network capacity is not limitless or cost-less.

Question 21:
What issues and effects could possibly arise due to a differentiation of services classes?

139 Applying some form of traffic prioritisation (rather than provisioning more and more bandwidth) ensures efficient use of local, regional and national network assets.

140 Traffic prioritisation supports value-based pricing - those wanting to 'pay more' can actually 'get more', and, as noted above, this is important to enable greater penetration in terms of speed and/or coverage.

141 Some applications are less tolerant to certain network behaviours (for example, broadcast video, interactive voice). Also, traffic prioritisation provides mechanisms by which service guarantees can be offered to end-users (for example, while delay on a budget voice service might be acceptable in times of high demand, it is unlikely to be acceptable on an alarm monitoring service or a high-definition video stream).

142 To provide acceptable NGN experience for users, without excessive network costs to users, some differentiation of traffic types is likely to be essential on the NGN, so available resources can be provided to those flows that justify it when momentary demand exceeds capacity on any network section.

143 In the Internet, traffic prioritisation is currently solved by randomly discarding packets at the congestion point, but application providers are learning to abuse this by exploiting weaknesses in the fairness mechanisms (TCP/IP) the Internet relies on. How and why certain flows might be more fairly treated is a current subject of international research.

144 Where services are not tolerant of higher loss, and therefore discarding packets renders the service unusable, then mechanisms are required to ensure entire flows are managed. The IMS architecture has some guidelines if all traffic competing for a resource is under the control of a single IMS control plane.

145 However, in general, the standards for managing traffic prioritisation in an NGN environment are in the early phases of development so there is little by way of international precedent to guide these discussions at this time.

Question 22:
Will the approaches to pricing change for NGN, particularly where different classes of service are offered?

146 There may be change, but it is impossible to predict, with any precision, the nature of that change at the present time.

147 In general though, there is no necessary link between the change of technology to NGN and changes to price parameters/structures. While cost drivers are an important part of price-setting, and businesses face risk when price structures are not aligned with cost structures, businesses must ultimately be able to market and sell their products in a way that customers relate to. This means that there may be good customer-focused reasons for price structures to differ from cost structures.

148 It is therefore typical to observe that technology change on its own does not lead to changes to pricing practice. For example, toll calls were rated by the minute in the days of manual exchanges. That stayed the same in the move to cross-bar exchanges and is still the case today – in the era of digital switches and SoftSwitches.

149 Similarly, the introduction of wireless technology to the network – which offered the added benefit of mobility - did not result in a change to the per minute rating structure.

150 The innovation we have seen around call pricing has been driven by encouraging use of off-peak capacity ($5 weekends), call stimulation (Favourite Place, etc) and Premium Rate Services (0900). All these examples of pricing innovation reflect the offer of additional value to a customer – rather than the price innovation being driven by technology change.

151 Retail service providers will continue to innovate, and compete, on price and pricing structures, depending on their business model, their customer proposition and the sophistication of their billing system.

152 As NGN Operators innovate they may try out new price structures, balancing as always the need to ensure that customers' needs are met and adequate returns are made. How customers place value on services (their value drivers) does not always match up with the things that drive costs – for example, customers may relate better to concepts of value tied around the services they experience (for example, voice calling versus web browsing) rather than around the priority given to particular types of traffic in the network.

153 New methods of measuring the different parameters of a call, session or transaction will allow operators to innovate with new or alternative pricing and trading models for their businesses. Operators need freedom to innovate and differentiate on pricing, otherwise coverage / speed will likely be more limited than would otherwise be possible.

Question 23:
Beyond the costs for NGN core, access, CPE and drop lead, are there additional costing elements to be taken into account? If so, what is their likely impact?

154 The elements discussed under question three are relevant here. We would stress that regulatory intervention has the risk of driving cost/complexity into OSS/BSS for NGN access providers and access seekers (not just Telecom).

Question 24:
Do you agree that in an NGN environment, a higher proportion of cost of the network is shared in common cost? What in your view is the best method for allocating costs, i.e., should it be based on volume, minutes or new drivers such as capacity?

155 It is not possible to answer this question without making potentially invalid assumptions regarding the structure of services and pricing in the NGN world. Given that NGN evolution is resulting in changes to technology, services and the market as a whole, it is likely that the structure of services and pricing will also evolve, in ways which cannot currently be predicted.

Question 25:
What is your view on the benefits and constraints of PON (Passive Optical Network) and P2P (Point to Point)?

156 PON and Point to Point fibre architectures are complementary network designs, suited to different physical and service environments. Telecom employs both architectures, with Point to Point architectures used extensively in high population density, business dominated environments, and PON being increasingly used in lower population density, predominantly

mass market / residential environments. This reflects both the economics of the underlying physical architectures, and the service demands and their match to technology capability.

157 In high density, business dominated areas, Point to Point architectures are favoured because of:

(a) Relatively short fibre distances from exchange to customer;

(b) Widely varying bandwidth demands (Mbit/s to Gbit/s);

(c) Strong demand for symmetric connectivity; and

(d) Security concerns with technologies on which multiple customers share common infrastructure in the local access network.

158 In lower density, mass market areas, PON architectures are favoured because of:

(a) Longer fibre distances from exchange to customer, favouring used of shared fibre and electronics infrastructure;

(b) Typically more modest and consistent bandwidth demands;

(c) Asymmetric connectivity being more common, which is well suited to PON technology; and

(d) Individual demands for high speed, symmetric demand can still be met (for example, GigE) on a customer-by-customer basis.

Question 26:
Do you agree with the generic definition of the terms interconnection and access? If not, what would be the alternative definitions?

159 The generic definitions are acceptable in the context.

160 We note, however, that the Commission uses the terms in a different way from WIK-Consult (citing an EC Directive[14]), and in a different way here from the way it uses them in its 2 December 2008 "Discussion Paper on IP Interconnection: Input to TCF IP Working Parties".

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[14] WIK-Consult, 29 January 2008, *The Future of IP Interconnection: Technical, Economic and Public Policy Aspects,* pp 3-4.

http://ec.europa.eu/information_society/policy/ecomm/doc/library/ext_studies/future_ip_interconn/ip_intercon_study_final.pdf

161 Both elements are required in order to achieve end to end service inter-working. Traditionally, the term "interconnection" has been used to refer to the two elements together, as, for example, in the Act, where the Designated Access Service of "Interconnection with Telecom's fixed PSTN" is described as "Origination and termination (and their associated functions) of voice and data calls (including dial-up internet calls) on Telecom's fixed PSTN".

162 It is not clear what is gained by making the interconnection/access distinction, especially as the discussion paper does not discuss it further or use it, but rather goes on to discuss a distinction between transport and service interconnection.

Question 27:
Do you agree with the pricing concepts outlined for NGN? What other pricing mechanisms could be applied?

163 We assume, from the context, that this question relates only to interconnection pricing mechanisms, and we answer it on that basis.

164 The difficulty we have with the Commission's outline of the pricing mechanism discussion is that the pricing mechanism cannot be considered in isolation from the overall commercial construct. Telecom's proposed model[15] cannot be described as "bill and keep" in the way the Commission uses the term, because the "termination at no charge" aspect of Telecom's proposal is inextricably tied up with other features, such as:

(a) The terminating operator's freedom to determine the location and number of its handover points;

(b) The fact that the service in question is termination of packets, rather than calls/call minutes; and

(c) The fact that the "termination at no charge" is the backstop to negotiation between the parties, rather than a mandatory/regulated price point.

165 Because of the approach taken to handover point selection in Telecom's proposal, Telecom's proposal addresses the hot-potato problem mentioned by the Commission in relation to bill and keep.

166 We also note that in this section of the discussion paper, the Commission refers (in the context of Receiving Party Pays pricing) to the possibility of retail price control. New Zealand should be cautious about adding further

[15] Telecom's proposed model for IP Interconnection, submitted to the TCF IP Interconnection Working Party, 1 September 2008.

layers of regulation, particularly at the retail level. International best practice supports regulation at the Wholesale level – the concept of a single point of regulation at the deepest level. Retail price control should only be considered as a last resort.

Question 28:
What additional factors have to be taken into account with regards to point of interconnection in an NGN environment and what is their effect?

167 There seems to be an assumption in the Commission's paper that network control equipment (such as BRAS) will not be distributed. However, for reasons of efficiency and redundancy in the backbone network, such elements might not be centralised. Telecom has BRAS equipment currently at 16 of the 29 tier 0/1/2 nodes, and at this stage expects to roll these out further.

168 There also seems to be an assumption that interconnection can only occur where such network control equipment is located. However, it is only control packets that need to go to this equipment and so interconnection may be able to be facilitated at places other than those at which the control equipment is located. An analogy is the present interconnection arrangements for 0800 traffic. 0800 traffic for Telecom is controlled by our Intelligent Network (**IN**) controllers, located in only two locations, rather than the 24 points at which the interconnection occurs.

169 Telecom's proposed model for IP Interconnection allows each operator to choose at what points it will offer interconnection. Rather than the Commission attempting to second-guess the trade-offs different operators will make in terms of the architecture of their networks and how they best might make a return on their investments, the Commission should be asking whether that freedom creates any new market failure or competition issues.

Question 29:
What are the implications for these issues in New Zealand? Are there specific regulatory issues anticipated?

170 It is true that NGNs may create implications for the issues listed in the discussion paper. However, in general, the industry has shown it can take a lead in addressing these kinds of issues – for example, the development of the 111 Code through the TCF. Therefore, the industry should be supported to resolve these issues in the first instance.

171 There are also some issues that are, by nature, bigger picture issues. These are issues that the telecommunications industry is not best-placed to resolve, or at least that are better dealt with by other bodies. An example is the protection of minors. These issues will need to be addressed in parallel, although obviously the industry will assist where appropriate.

Question 30:
What additional factors have to be taken into account and what is their effect?

172 We consider the following issues may require industry consultation and/or agreement:

(a) Lawful intercept;

(b) Fault identification;

(c) Responsibility for maintenance;

(d) Cable location; and

(e) Test wavelengths.

Annex 1: Maps

Annex 2: Comparison Table of Legislative Purpose Statements and Regulatory Principles

	New Zealand Telecommunications Regulatory Regime	UK Telecommunications Regulatory Regime	Parts 4 and 4A of the Commerce Act
Purpose statement	The purpose of this Part and Schedules 1 to 3 is to promote competition in telecommunications markets for the long-term benefit of end-users of telecommunications services within New Zealand by regulating, and providing for the regulation of, the supply of certain telecommunications services between service providers. (2)In determining whether or not, or the extent to which, any act or omission will result, or will be likely to result, in competition in telecommunications markets for the long-term benefit of end-users of telecommunications services within New Zealand, the efficiencies that will result, or will be likely to result, from that act or omission must be considered.	Ofcom's principle duty is: (a) to further the interests of citizens in relation to communications matters; and (b) to further the interests of consumers in relevant markets, where appropriate by promoting competition" In performing their duties Ofcom must have regard to: (a) the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed; and (b) any other principles appearing to Ofcom to represent the best regulatory practice. Ofcom must also have regard, in performing those duties, to other factors as seem relevant in the circumstances. These factors are: • the desirability of promoting the fulfilment of the purposes of public service television broadcasting in the United Kingdom; • the desirability of promoting competition in relevant markets; • the desirability of promoting and facilitating the development and use of effective forms of self-regulation; • the desirability of encouraging investment and	The purpose of this Part is to promote the long-term benefit of consumers in markets referred to in section 52 by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services— (a)have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and (b)have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and (c)share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and (d)are limited in their ability to extract excessive profits. And, the purpose of subpart 1, Part 4A: The purpose of this subpart is to

		innovation in relevant markets; • the desirability of encouraging the availability and use of high speed data transfer services throughout the United Kingdom; • the different needs and interests, so far as the use of the electro-magnetic spectrum for wireless telegraphy is concerned, of all persons who may wish to make use of it; • the need to secure that the application in the case of television and radio services of standards is in the manner that best guarantees an appropriate level of freedom of expression; • the vulnerability of children and of others whose circumstances appear to Ofcom to put them in need of special protection; • the needs of persons with disabilities, of the elderly and of those on low incomes; • the desirability of preventing crime and disorder; • the opinions of consumers in relevant markets and of members of the public generally; • the different interests of persons in the different parts of the United Kingdom, of the different ethnic communities within the United Kingdom and of persons living in rural and in urban areas; and • the extent to which, in the circumstances of the case, the furthering or securing of the matters mentioned in subsections (1) and (2) is reasonably practicable.	promote the efficient operation of markets directly related to electricity distribution and transmission services through targeted control for the long-term benefit of consumers by ensuring that suppliers— (a)are limited in their ability to extract excessive profits; and (b)face strong incentives to improve efficiency and provide services at a quality that reflects consumer demands; and (c)share the benefits of efficiency gains with consumers, including through lower prices.
General Principles:		• Ofcom will regulate with a clearly articulated and publicly reviewed annual plan, with stated policy objectives.	Key economic principles which will assist in promoting the purpose of Part 4:

		• Ofcom will intervene where there is a specific statutory duty to work towards a public policy goal which markets alone cannot achieve. • Ofcom will operate with a bias against intervention, but with a willingness to intervene firmly, promptly and effectively where required. • Ofcom will strive to ensure its interventions will be evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome. • Ofcom will always seek the least intrusive regulatory mechanisms to achieve its policy objectives. • Ofcom will research markets constantly and will aim to remain at the forefront of technological understanding. • Ofcom will consult widely with all relevant stakeholders and assess the impact of regulatory action before imposing regulation upon a market.	• promote allocative efficiency, subject to the opportunity for regulated • businesses to earn normal returns; • promote realistic and achievable gains in productive efficiency; and • promote dynamic efficiency by incentivising efficient investment. Implementation principles: • consistency; • flexibility; and • cost-effectiveness.
NGN Principles	• the scope for competition for the long term benefit of end users should be preserved and enhanced where possible in a next generation environment; • incentives to invest in next generation infrastructure, including access networks, as well as applications and services, should be preserved; • industry self regulation should be encouraged, where this mechanism can deal effectively with next	• contestability: we think that timely and efficient investment will best be achieved by making the investment contestable, allowing any operator who considers that there is a business case for deploying next generation access infrastructure to invest, as soon as they wish; • maximising potential for innovation: as we recognised in the Telecoms Review for current networks, we believe that the scope for innovation and differentiation is essential for competition in next generation access, and that infrastructure investment is helpful in achieving this. We are consulting on an approach which maximises the potential for innovation, while allowing for the current economic	N/A

	generation network issues, particularly in relation to technical issues; • regulation should be considered only where necessary to constrain market power - where, for example, it is conferred by control over bottlenecks; regulation should be scaled back as workable and effective competition develops.	and technical uncertainty around next generation access; • equivalence: strong competition in current generation broadband has been helped by ensuring that all operators are able to buy exactly the same wholesale products, with the same processes and at the same price, as operators with market power. We propose to apply this principle to next generation access, supported by approaches such as functional separation, essential to reduce incentives for anti-competitive behaviour while retaining incentives for efficient investment; • reflecting risk in returns: we recognise that anyone who makes investments in next generation access is likely to face significant commercial risks. Regulation should reflect these risks in order to provide appropriate incentives for investment in the first place. We are consulting on a range of approaches to reflect such risk such as anchor product regulation, and risk-adjusted returns; and • regulatory certainty: It is also important that the regulatory regime we adopt is clear and in place for a reasonable period of time, to allow investors the clarity that they need to invest with confidence. We are publishing this consultation and establishing a program of seminars and meetings supporting it to provide this clarity.	