



**Vodafone New Zealand Limited**  
**Corporate Affairs**  
20 Viaduct Harbour Avenue  
Private Bag 92161  
Auckland, New Zealand

Reception +64-9-355 2000  
Facsimile +64-9-355 2006

16 February 2009

Mr Mark Forward  
Project Manager NGN Study  
Telecommunications Branch  
Commerce Commission  
WELLINGTON

Dear Mark,

### **Discussion Paper on Next Generation Networks – Response to Questions**

Vodafone welcomes the opportunity to provide feedback on the Commission's approach to the NGN study. Vodafone also welcomes the contribution the Discussion Paper makes to the debate on the implications of NGN development, even if some of the issues may be more appropriately dealt with by a policy agency than a regulatory body.

This letter is Vodafone's response to the questions contained in the Commission's Discussion Paper on Next Generation Networks. It is intended to build on Vodafone's October 2008 submission and does not necessarily repeat points made at that time unless required to answer one of the questions.

#### **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?***

The TCF IP Interconnect Working Party represents a good start as it is providing a mechanism for debating issues in a pan-industry environment. The biggest issue we all face is that we still really don't know what we don't know. No-one anywhere has yet fully defined the problem let alone the solutions. This leads to a risk that by moving too early we lock ourselves into an inadequately considered solution which over time causes more problems than it solves. Moving forward on a cooperative basis, recognising the need for potential change is the best way forward.

The Commission's NGN Study and upcoming "Broadband at a Crossroads" conference will help ensure a broad input into future decision making on this key topic.

It will be important for any new Government broadband investment initiative to take a holistic view of end-to-end network capability, not just the access network. An increase in capability of the access network must be matched by the capability of the backhaul network and our international connectivity.

The application services market is likely to grow over time without Government intervention. However it is possible that the establishment of a "service development forum" to encourage software developers to generate more value from broadband than it provides today (largely just email, www and P2P) may help this market develop faster.

### **Question 2**

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

Vodafone fully supports the core principles set out in the Commission's discussion paper.

We should not be satisfied with the current level of broadband competition in New Zealand. Therefore simply protecting existing levels of competition as we move into an NGAN (Next Generation Access Network) environment may not be enough. We believe that, with the right regulatory approach, the NGAN can provide an opportunity to extend competition.

It is also critical that due attention is given to migration from UCLL to NGAN-based competition, so as to not undermine existing DSL-based competition. Clear rules (including a reasonable notice period) should be established ahead of actual migration to minimise duplication and encourage investment.

### **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?***

The quoted ITU definition is sufficient in Vodafone's opinion. Further to that, the NGN is characterised by the following fundamental aspects:

- Packet-based transfer
- Separation of control functions among bearer capabilities, call/session, and application/service
- Decoupling of service provision from transport, and provision of open interfaces
- Support for a wide range of services, applications and mechanisms based on service building blocks (including real time/streaming/non-real time services and multi-media)
- Broadband capabilities with end-to-end QoS and transparency
- Interworking with legacy networks via open interfaces
- Generalised mobility
- Unfettered access by users to different service providers
- A variety of identification schemes which can be resolved to IP addresses for the purposes of routing in IP networks
- Unified service characteristics for the same service as perceived by the user
- Converged services between Fixed and Mobile networks
- Independence of service-related functions from underlying transport technologies
- Support of multiple last mile technologies

- Compliant with all Regulatory requirements, for example concerning emergency communications and security/privacy, etc.
- Agnostic of underlying network technology

Vodafone does not consider that any additional elements need to be taken into account than those already considered by the Commission.

#### **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?***

IMS is not intended to standardize applications but rather to aid the access of multimedia and voice applications from wireless and wireline terminals, i.e. create a form of fixed to mobile convergence (FMC). This is done by having a horizontal control layer that isolates the access network from the service layer. Services need not have their own control functions, as the control layer is a common horizontal layer. In the future, it may further include automation of network and services provisioning (currently done by various OSS/BSS). The concept of the service layer being separated from the network layer is absolutely necessary to the NGN. In the interim, operators that do not have IMS are using alternative means (e.g. running two parallel systems for fixed and mobile, soft switches etc.). Other systems beside IMS can be utilised to deliver services, but these are likely to service/product specific. However, in the long run, IMS functionality is expected to play a significant role in enabling true next generation services.

#### **Question 5**

***Where and how should the balance between coverage and speed be struck?***

The balance between coverage and speed will be determined by economics, the balance between demand and cost. Let the application of market forces, rather than regulatory intervention, be the decider. Recent research has shown that there is generally little willingness on the part of consumers to pay significantly more for increased speed/bandwidth.

It seems as if Moore's Law can be extrapolated to consumer demand in the broadband space; NGN technology will have to cater for fast-growing bandwidth requirements. It is also important that there be a technology neutral approach taken as different technologies can deliver cost effective solutions in different circumstances. Due to the limitations of the various technology choices (copper, fibre, wireless), the maximum speed (and therefore services) that can be offered will be different. In the near future where voice, web browsing and email are the key services, speed limitations should not be a significant issue. However, in the longer term where higher bandwidth services will be required, then higher bandwidth technologies (WiMAX, LTE or fibre) will be required. In most rural locations, fibre access will be uneconomical and wireless technologies should be used. However, it is important that these wireless access technologies are supported by fibre backhaul in order to avoid merely shifting the bottleneck in the service chain.

#### **Question 6**

***Is industry consultation necessary on network design for NGN?***

While industry consultation on network design is probably a step too far, the TCF IP Interconnect Working Party is looking to establish agreed technical standards for interconnection. This is preferable to consultation on network design. Network design should be up to the network owner, although where potential bottleneck assets are concerned, consultation on fibre topology will be necessary to ensure appropriate unbundled (or open) access.

Any government investment in broadband infrastructure will certainly require industry consultation on fibre topology as well as technical interconnection standards.

***Question 7***

***i. How does the deployment of NGN change bottleneck characteristics?***

NGN deployment will not change bottleneck characteristics beyond the change of technology. Assuming the Government proceeds with its proposed FTTH rollout then this will create a new bottleneck asset (the access fibre). In order to deliver the desired NGN outcomes, a holistic view of the end to end network is required, not merely a focus on the NGAN.

The Government's FTTH proposal contemplates somewhere between a one hundred fold and a one thousand fold increase in performance in the access network and if this increase is not matched by a similar step increase in backhaul capacity and international connectivity elements, the desired productivity gains will not be realised. A network is only as fast as its slowest element.

There needs to be a corresponding step increase in international connectivity and in backhaul capacity in parallel with investment in the NGAN. This may require additional investment or access to existing fibre backhaul infrastructure on terms aligned with the required step increase in capacity. This backhaul is required by both fixed and wireless networks to deliver the desired outcomes.

Today backhaul has a greater impact on the average broadband user experience than the "last mile" access does. The weighted average speed of the line length sample provided by Telecom, as part of the sub-loop unbundling process, is around 10Mbps. However, according to Eptiro data, the average broadband speed in New Zealand today is around 3Mbps. When Telecom's cabinetisation program is completed this weighted average speed will increase to 18Mbps. If there is no improvement in backhaul capacity or international connectivity there will be little improvement in broadband performance.

Telecom states that it currently dimensions its backhaul network to just 32kbps per end user. This equates to a contention ratio of 300:1 if Telecom is to deliver 10Mbps speeds it has committed to deliver. International experience suggests that contention ratios are commonly around 20-50:1. A significant improvement in broadband performance can be delivered by improving backhaul capacity and international connectivity. With unbundling now a reality, competitive service providers are now dimensioning their backhaul to many times the Telecom figure.

A step increase in backhaul performance will enable all access technologies (fibre, copper, mobile and other wireless) to deliver significantly improved performance.

Currently backhaul is primarily sold as a managed service in units of capacity. The cost of this service makes it prohibitive to increase the backhaul provided by the orders of magnitude required to deliver FTTH. Going forward backhaul will need to be provided as unconstrained capacity, either dark fibre or wavelengths. If fibre backhaul providers are not prepared to sell backhaul on this basis they will create backhaul bottlenecks that will constrain the potential benefits from the NGN.

Substantial fibre backhaul is essential if the NGAN (both FTTH and mobile data) benefits are to be realised. There is substantial backhaul fibre capacity in parts of New Zealand while in other areas there are significant constraints. In areas of high demand there has been competitive fibre build; in others there is a single fibre infrastructure provider while elsewhere (particularly rural areas) no fibre has been built. A combination of Government investment in fibre backhaul in areas where it is not currently economic to deploy, combined with appropriate regulation of access to clearly identifiable bottleneck infrastructure (to avoid inefficient duplication) in areas where there is limited competition, may well be necessary.

New Zealand's only significant international connection, the Southern Cross Cable, is currently operating at about half of its maximum design capacity. While improved technology may enable further capacity increases, Southern Cross will be unable to support the step change in connectivity demands expected with the NGN (especially those brought on by the proposed FTTH deployment). Accordingly there is a very strong case to support additional high capacity international connectivity in the longer term. Shorter term growth in international connectivity is likely to be limited by the high cost of access to this monopoly infrastructure, which we understand to be 3 times more expensive than similar under-sea cables. Service providers are currently paying in the vicinity of \$10 per internet customer per month for international connectivity, and there is certainly no appetite from consumers to pay more than this as their volume demands grow.

***ii. Is access to the infrastructure still an issue? If not, what other elements could become important?***

Access to infrastructure will remain an issue; the current copper local loop access bottleneck will be replaced with a FTTH or FTTN access bottleneck; the current cable duct bottleneck will likely remain. In addition, national backhaul and international connectivity are likely to remain bottleneck assets as demand on these areas multiplies. Further to this, the ability to offer some NGN services (e.g. VoD, IPTV) will be dependent on access to content.

***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?***

Open access means access to either bottleneck or subsidised infrastructure assets (usually layer 0 or layer 1) on a non-discriminatory basis, in other words, all access seekers have access to the asset on equal terms (both price and non-price). The asset owner does not enjoy an advantage relative to other access seekers.

***Question 9***

***What are the areas that are not likely to be commercially funded?***

Provision of infrastructure in remote (usually rural) areas is not likely to have a positive business case. Lack of incentive to invest in rural areas is exacerbated by the current Local Service TSO. It is important that this issue is resolved urgently

There is also the issue that consumers are generally reluctant to pay more than they do today for improved services provided over more expensive infrastructure. In particular the current cost of international connectivity will be even harder to justify as consumers expect more for less.

***Question 10***

***i. What do you believe is needed to drive broadband penetration and speed in the future in New Zealand?***

The broadband experience in New Zealand needs to improve for the majority of the consumers to begin with. This is not just improvement in the last mile access speed, but even more so an improvement in backhaul performance, as today this is typically severely congested. Similarly as usage grows, higher data caps will be required, but this is constrained by the current cost of international connectivity.

However demand for more speed and volume will be driven by the availability of new applications and services that deliver real benefit to people's lives, presumably in the areas such as entertainment (IPTV), security (remote monitoring), business efficiency, telemedicine, etc.

***ii. Do you agree that cost savings are one of the core drivers for NGN deployment in New Zealand?***

Yes in the long term, but in the short term any savings will be offset by the costs of maintaining and migrating from legacy services.

***iii. How will competition enable innovation?***

As the revenue for traditional services (such as voice) drops and the capabilities of the different operators become similar, then operators will need to develop additional services that they can offer to their customers to both increase revenue and create differentiation.

Currently the the broadband "pipe" is a real differentiator between operators, through speed and volume caps. In the future the differentiators are likely to be QoS options (i.e. price plan and bundles), services on offer, and access to applications and content. All of these are new to operators and innovation will be needed to stay competitive.

***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?***

A "build it and they will come" approach will not satisfy the requirements of most investors' business case criteria. If the infrastructure is to be built significantly ahead of

service demand, then the build will need to be done by an investor with a return on investment requirements significantly different from most current infrastructure investors. Government may be the investor best suited to this approach.

It is worth noting that the performance of existing access infrastructure is not able to be fully exploited today because of congestion in the backhaul being the primary performance constraint. Building new faster access pipes without taking a holistic view of the end-to-end supply chain and dealing with bottlenecks in backhaul and international connectivity, will not achieve the desired outcome.

Improvements in network capability must be closely linked to improved service offerings, whichever comes first. The challenge and the key to success is to time the investment so that the operator has a positive service offering to support ongoing expansion/improvement of the network.

#### **Question 12**

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

Exclusive access to key content, especially sport, can certainly be a hindrance to competition in broadband services, especially as increasing performance allows for widespread uptake of IPTV services. However a large and growing volume of content is free to consumers and operators can further add value by being a trusted source for that content. Further to this, other non-content based innovative services can also drive development and adoption of broadband.

Currently the cost of international connectivity is just as big an issue in accessing international content as the cost of the content itself.

#### **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?***

As with our response to the previous question, the exclusive nature of key content will have an impact. However TV / entertainment is only one of the services that the NGN will enable. There will be many other factors that will influence the development and take up of NGN.

#### **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?***

The proposed service scenarios are a logical way to analyse the development of NGNs. However we should take care not to limit scenario 3 to known current opportunities.

#### **Question 15**

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

The reality is that as we move from a predominantly circuit switched environment to a packet switched environment, the traditional roles of suppliers within the value chain will change and new charging models will need to be developed to accommodate changing value streams.

More service/application development companies (such as Google) will emerge as a result of an all-IP environment. With telecommunications wrapped around their finger tips, consumers can and will change their demands at an ever increasing pace and these companies will need to be dynamic in order to stay competitive. These companies will not be bounded by the national borders but instead target consumers all over the world since their products should work over all NGN networks. Traditional operators will need to change the way in which they operate (so that they can adapt quickly to the needs of consumers) if they want to be service/application developers themselves. Consumers may well be swamped by large volumes of similar applications/services, but traditional operators can add value to their core business by becoming a trusted provider for good quality services. They can either develop those applications themselves or they can guide their customers to select available services/applications and made them accessible at their portal.

***Question 16***

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

The emergence of FTTH or even FTTN NGANs will have a material impact on DSL-based competition that will need to be managed through appropriate migration rules, which may include reasonable notice periods and continued availability of viable bitstream services (possibly over fibre rather than traditional copper) as a backup to the preferred unbundled access.

From a retail perspective, by the time the NGN is rolled out, "traditional" Telco services and coverage will be very similar between different operators. Therefore operators will need to differentiate themselves by other means. This can be achieved in many ways:

- i) Different price plans based on QoS. QoS will allow operators to offer a larger variety of services to customers since the operator should be able to both a) differentiate between different subscribers and b) differentiate between applications that the subscriber is using. This will lead to lowering of cost to consumer (allowing best efforts) which will increase usage overall.
- ii) Operators will also offer newer services that may be outside the "traditional" Telco landscape. These new revenue streams will make good use of the efficient transport system.
- iii) Create a new industry of NGN application/service developers that can sell locally or overseas.
- iv) More partnerships may form as the battle ground moves from coverage and speed to services. i.e., it may encourage more co-sharing of physical network.
- v) Pooling of resources in general, may it be spectrum, physical network, core network etc.

**Question 17**

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

Already addressed with preceding questions.

**Question 18**

***To what extent is symmetric speed or capacity necessary to provide future services to customers?***

Increasingly more important. Not only for user generated content but if we are to enable new business to sell NGN services, then the uplink is equally important as downlink because interactivity is key to many new services.

**Question 19**

***What are the most important and significant drivers of bandwidth demand?***

Pricing is the most significant driver of demand. But after that, high quality content (especially video); high quality video sharing services; communication (virtual reality type communication services); remote backup services; remote 'virtual disks' and other storage solutions.

**Question 20**

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

Differentiation of services is an appropriate approach to dealing with QoS degradation, but so is differentiation of users (subscription fee based), in conjunction with appropriate network dimensioning.

**Question 21**

***What issues and effects could possibly arise due to a differentiation of services classes?***

Differentiation of service classes will mean increased transmission overhead and require a more complicated and more intelligent core. Overall, it will provide more options for consumers. People can choose their desired QoS for a certain application/service, it will enable lower access fees (for best effort services) and may stimulate higher use.

**Question 22**

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

Yes, as above, different QoS levels will likely lead to another pricing dimension.

**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?***

These are the primary costing elements, although internal building wiring should not be ignored. It must be stressed that the access cost will be the most significant, and will usually include duct as well as cable costs.

Consideration could also be given to R&D costs for new services, and the costs of migration from legacy networks and services. Legacy services are likely to remain for many years, because of the unwillingness of some consumers to incur the cost and effort of changing CPE. Therefore IP to TDM conversion services will be required for some time. The cost of these services, along with fixed and common costs in general, must be recovered.

***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?***

Certainly old pricing methodologies may not remain relevant. In considering change, costs and cost drivers must be well understood. In particular, costs per subscriber and costs per IP packet vary substantially depending on the access technology.

In a fixed line access network, each customer enjoys a dedicated line from their premises to the exchange (or cabinet). Conversely in a wireless access network, customers share a strictly limited amount of spectrum at each cell site, and the network operator must manage contention at the access level (often through charging for incoming or outgoing traffic). As traffic increases, more and more cell sites must continually be built, each progressively servicing a smaller area / number of customers.

Capacity and coverage are likely to be the two key pricing or cost allocation metrics going forward.

***Question 25***

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

PON is cheaper and consumes less space and power and requires less monitoring (being part passive), but has unsymmetrical uplink and downlink, with limited expansion potential (2.4 Gbps max download with current technology). Appropriate location of concentration points is critical if PON is to be considered for unbundled (or open) access.

P2P is marginally more expensive; current equipment requires more power, space and monitoring than PON; it has better expansion potential and likely to be more beneficial in the long run. It is important to note that this option is more suited to unbundled (or open) access and therefore should receive preferential regulatory treatment.

***Question 26***

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

Yes.

***Question 27***

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

Yes the Commission has outlined the three main interconnect charging mechanisms, although Vodafone considers this to be a very simplistic view.

The charging arrangements for voice in New Zealand and most of the rest of the world are commonly referred to as CPP. However it is important to note that the model caters (in terms of interconnect charging and responsibility for building interconnect links) for both toll calls and "tollfree" calls. Tollfree calls are not actually free of a retail toll, but are simply reverse charge at the retail level and interconnect level. For a tollfree call, the receiving party pays. If a fixed and mobile party take it in turns to call each other, over the two calls (inbound and outbound) both pay roughly half the cost of the mobile access leg of the call (and half the cost of the fixed access leg). Both parties therefore pay half each of the end-to-end cost (over 2 calls).

The retail model in for example the US, Canada and Singapore is commonly referred to as RPP. However it would be more accurately referred to as Mobile Party Pays. Under this model, if a fixed party and a mobile party take it in turns to call each other, the mobile party pays for inbound calls, but under RPP, the mobile party also pays for outbound calls. If a fixed and mobile party take it in turns to call each other, over the 2 calls (inbound and outbound), the mobile party always pays all the cost of the mobile access legs of both inbound and outbound calls, even though both parties may benefit from the mobility aspect.

B&K at the interconnect level commonly results in both retail parties paying for traffic. It might represent a roughly equal exchange of value in some circumstances, for example if the traffic between operators is similar in nature and volume (particularly in terms of cost). It is important to note that commercially agreed B&K arrangements (whereby a reciprocal charge of zero is applied) are subject to the safeguard for both parties that they are able to be changed (e.g. to a paid settlement basis) either on notice, or on expiry of a mutually agreed term, if the value exchange loses its reciprocity / equivalence.

Alternative models exist. The most common would be "both parties pay". Examples are:

1. The paid peering arrangements for IP traffic. Each party pays the other for the traffic carried by the other party on its network. The volume and rate may or may not be symmetrical.
2. International roaming. Both parties benefit from being able to communicate with each other on a mobile basis within New Zealand, but it is deemed that the internationally roaming party is the one benefiting from the international mobility. Both parties are charged at retail for a call from a fixed line to a mobile user who is internationally roaming.

3. Calls from New Zealand to USA 1-800 (tollfree) numbers. New Zealand subscribers pay for an international call up to the USA (the call is not free from outside of the USA). The US business owning the 1-800 number pays for the call to the extent that their provider transports the call within the USA.
4. An example from overseas is 1-300 in Australia. In this case, the calling party pays for a local call at their standard local calling rate, usually 20 cents per call. It is therefore not free to caller. The Business owning the 1-300 number also pays for the call, in particular for the cost of transporting the call nationally to their call centre.

It is important to note that in these “both parties pay” examples, it cannot be assumed that both parties are paying for the end-to-end call. There are at least three possibilities:

- (a) Each party is paying for the end to end call.
- (b) Each party is in effect paying for the near end only (i.e. their provider’s on-net costs)
- (c) Each party is in effect paying for the far end only (i.e. their provider’s off-net costs)

In the case of Internet traffic, New Zealand consumers commonly pay data charges for downloads and uploads. Currently well over 90% of data (traffic) for New Zealand Internet access is for overseas content. Only a small proportion is domestic, and an even smaller proportion is on-net traffic/content. Note that this may change significantly in the future as services which are currently TDM based, such as local, national and New Zealand mobile calling gradually transition to IP -based (both for the interconnect between carriers, and the customer access).

Currently, the primary driver of cost for Internet data charges to consumers is the off-net international IP transit cost. Although costs are typically lower for domestic IP transit (or peering) and on-net content than for international IP transit / content, there are costs in terms of dollars and effort to bill differentially for international vs. domestic vs. on-net content. Perhaps because of this, and perhaps because currently only a small proportion of Internet content is domestic / on-net, most operators do not charge less for the domestic / on-net portion of customers' traffic, which has a lower cost (although there are exceptions). Therefore it could be said that, currently, Internet data (usage) charges in New Zealand are driven primarily by off-net costs (or far end) costs.

Interconnect models must take account of the accepted / prevailing commercial retail models, for example whether retail customers are accustomed to paying for incoming traffic in some way. This may vary for different services, for example in New Zealand, customers are accustomed to "free" incoming calls and texts, but are accustomed to paying for incoming data (i.e. their downloads) and for incoming calls when they are internationally roaming.

An alternative model for IP interconnect might therefore be that both parties pay each other for the far end (off-net) costs of both their download and upload traffic. If the costs and traffic of both parties are symmetrical (e.g. peering between two similar sized peers with the same access network technology with symmetric traffic flows), this might give essentially the same net result as B&K. However in other circumstances, such as where the efficiently incurred access costs are different for the two operators, or the traffic volumes are different, it may not.

Alternatively, IP interconnect commercial arrangements might vary according to what retail arrangements apply to incoming traffic. For example, if the recipient of an incoming Skype call is paying data charges, then potentially the recipient might arguably be paying for the costs of the incoming call end to end. Conversely if an incoming call, received over an IP interconnect, is converted to TDM for delivery to the customer, then under the currently prevailing New Zealand retail model of CPP, the recipient is not paying at all for the incoming call. In essence, IP interconnect might cover exchange of IP traffic, but an additional charge might then apply for IP to TDM conversion services (logically there may not need to be a charge for TDM to IP conversion services, since retail users are accustomed to paying for IP data charges for incoming IP calls).

Vodafone believes that interconnect charging regimes should provide operators with reasonable cost recovery mechanisms. We need to ensure that any new models are not just mechanisms for shifting cost inappropriately and that a cost-causer pays model should prevail. Any change to the current regime should be shown to distribute costs more fairly and offer clear long term benefit to end users.

B&K may be appropriate in some circumstances if commercially agreed and with appropriate protections should traffic become imbalanced, for example through the use of thresholds. It may be required by regulatory means only in very exceptional circumstance to mitigate the effects of other regulatory requirements of one interconnecting party.

The TCF IP Interconnect Working Party is currently working on an industry solution for IP interconnection, including commercial models.

**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?***

These issues are currently being explored in considerable detail within the TCF IP Interconnect Working Party, which is the appropriate forum for this topic.

**Question 29**

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

With some of the issues listed, if they were to remain largely within control of a single NGN operator, might become a way of creating a competitive barrier for competing NGNs.

**Question 30**

***What additional factors have to be taken into account and what is their effect?***

Perhaps the most significant area that requires further consideration is that of migration from legacy networks to the NGN, particularly from UCLL to NGN-based competition. As previously stated, clear rules should be established ahead of actual migration to minimise duplication and encourage investment. Viable sub-loop unbundling is a crucial interim requirement; moving towards open access dark fibre in the longer term.

Wholesale bitstream access, over copper or fibre or a combination (FTTN) must always be available as a back-up option to fully unbundled access.

Please feel free to contact me in relation to this letter if any clarification would be helpful. In this regard, I can be contacted by telephone on 021 2750003 or via email at [david.diprose@vodafone.com](mailto:david.diprose@vodafone.com).

Yours sincerely,

A handwritten signature in black ink, appearing to read 'David Diprose', written in a cursive style.

David Diprose  
Head of Fixed Line Regulatory  
Vodafone New Zealand Limited