Brisbane City Council ABN 72 002 765 795

Dedicated to a better Brisbane

4 March 2011

Committee Secretary
House of Representatives Standing Committee on
Infrastructure and Communications
PO Box 6021
Parliament House
CANBERRA ACT 2600

Dear Committee Secretary

Please find attached Brisbane City Council's (Council) submission to the House of Representatives Standing Committee on Infrastructure and Communications inquiry into the role and potential of the National Broadband Network (NBN).

Council has previously provided responses to the Australian Government on a range of issues regarding the NBN, including:

- a verbal submission to the Senate Select Inquiry into the NBN on 21 November 2008,

- the discussion paper National *Broadband Network: Fibre-to-the-premises in greenfield estates* in June 2009,

- the exposure draft of the *Telecommunications Legislation Amendment (Fibre Deployment) Bill 2010* in January 2010,

- the *position paper: proposed subordinate legislation to give effect to fibre in new developments* in May 2010, and

- the *National Broadband Network Implementation Study* in May 2010.

Council also provided a submission to NBN Co on the *NBN Co consultation paper: proposed wholesale fibre bitstream products* in February 2010.

Council reaffirms the views provided in these previous submissions.

...../2

Office of the Lord Mayor and CEO, Chief Executive's Office
Level 23, 266 George Street Brisbane, GPO Box 1434 Brisbane Qld 4001
T 07 3403 8888 **F** 07 3334 0043

-2-

Council supports the goal of providing fibre-to-the-premises, high speed broadband throughout Australia. Council believes provision of an affordable, wholesale-only network that provides accessibility for any entity will provide significant economic benefits to Brisbane and Australia.

For further information, please contact Mr David Jackson, Manager of Economic Development Branch via telephone   . Mr Jackson and Council officers are willing to meet with the Committee and/or appear at any hearings of the Committee as appropriate.

Yours sincerely

Colin Jensen
CHIEF EXECUTIVE OFFICER

Brisbane City Council's submission to the House of Representatives Standing Committee on Infrastructure and Communications

Inquiry into the role and potential of the National Broadband Network

4 March 2011

Introduction

This submission provides Brisbane City Council's (Council) views on the potential benefits of a National Broadband Network (NBN). On 7 December 2010, the House of Representatives Standing Committee on Infrastructure and Communications called for public submissions regarding its *Inquiry into the role and potential of the National Broadband Network.*

Council has previously provided responses to the Australian Government on a range of issues regarding the National Broadband Network, including:

- a verbal submission to the Senate Select Inquiry into the National Broadband Network on 21 November 2008,

- the discussion paper *National Broadband Network: Fibre-to-the-premises in greenfield estates* in June 2009,

- the exposure draft of the *Telecommunications Legislation Amendment (Fibre Deployment) Bill 2010* in January 2010,

- the position paper: *proposed subordinate legislation to give effect to fibre in new developments* in May 2010, and

- the *National Broadband Network Implementation Study* in May 2010.

Council also provided a submission to NBN Co on the *NBN Co consultation paper: proposed wholesale fibre bitstream products* in February 2010.

Council reaffirms the views provided in these previous submissions.

Terms of reference

As stated in the terms of reference for the inquiry, the House Committee will examine the capacity of the National Broadband Network to contribute to:

a) the delivery of government services and programs;

b) achieving health outcomes;

c) improving the educational resources and training available for teachers and students;

d) the management of Australia's built and natural resources and environmental sustainability;

e) impacting regional economic growth and employment opportunities;

f) impacting business efficiencies and revenues, particularly for small and medium business, and Australia's export market;

g) interaction with research and development and related innovation investments;

h) facilitating community and social benefits; and

i) the optimal capacity and technological requirements of a network to deliver these outcomes.

Council's response

Council agrees that a high speed fibre optic broadband network has the capacity to significantly contribute to all the outcomes from point a) to point h). Council has been working for a numbers of years to facilitate the rollout of a fibre network in Brisbane in recognition of the benefits it will provide. This submission does not attempt to quantify the extent of this contribution.

The most important aspect the Australian Government and NBN Co should be considering (and the area they have most control over) during the network planning and design phase is point i) in the terms of reference. This considers the optimal capacity and technological requirements of a network to deliver the outcomes from point a) to point h).

Rather than being an outcome, point i) is a network design consideration, which will significantly determine the extent of the benefit derived within outcomes a) to h). If Government gets the network design right, many of these outcomes will be achieved through innovation facilitated by the network. The network will provide the market with the platform to develop innovative applications. It is important to ensure an optimal network design at the planning phase, as it can be expensive to retrofit the network in the future.

Council's previous submissions to the Australian Government have focussed on these network design issues. The sections below provide a summary of Council's position on these issues.

1. Wholesale-only open access

Council has been consistent in advocating a wholesale-only open access network to ensure equal opportunity for competition at the content level.

Council supports the principle that the Australian Government implements a wholesale-only restriction on NBN Co. However, this restriction should only prevent NBN Co from providing content services (i.e. it should ensure NBN Co only provides wholesale services). It should not prevent NBN Co from providing wholesale access to users other than a carrier or service provider. Such a restriction would limit the openness of the network.

The current NBN model provides open access only for content and service providers. It is not open access for end users. The model still retains parts of legacy models assuming users only want to download content and services from a provider.

Under the proposed NBN, end users will still be required to sign with a provider to access the NBN. While end users may get a choice (or a wider choice) of which provider they sign with, they will still not have genuine open access to the NBN.

Full open access is of particular benefit for small and medium businesses that operate multiple offices, depots or shops, or need direct business-to-business connections with trading partners. They may not need an Internet Service Provider (ISP) at every site, and instead may need a virtual Wide Area Network (WAN) that they can manage themselves.

The NBN can be much more beneficial if it is made genuinely open. This includes all users having the ability to:

- have multiple providers simultaneously

- freely switch (their own traffic) between providers in real time without penalty

- provide their own content or services to other users (or their own remote sites)

- use the network for point-to-point traffic without needing to use a content provider.

This way the NBN would be truly open. Council recognises that this will most likely only be possible at layer three (network (IP) layer).

This network structure presents the greatest potential for economic development, through providing maximum opportunity for all end-users to innovate and create new applications and business opportunities over the network.

As discussed in the next section, Council believes a point-to-point network architecture best supports this network structure.

2. Point-to-point vs. point-to-multipoint architecture

As stated previously, Council's view is that NBN Co should rollout a point-to-point fibre network to maximise the future economic potential of the network. In contrast, NBN Co has previously stated that passive optical network (PON), or point-to-multipoint, is NBN Co's preferred option for wide scale deployment (with some capacity for point-to-point).

The following sections outline the reasons why a point-to-point fibre network is the solution that best supports long term economic growth for the NBN rollout. This includes consideration of the ability to upgrade, the potential for competition, symmetry in the network, cost, power consumption and exchange size. All these factors need to be taken into account when considering the optimal network architecture for the NBN.

a. *Ability to upgrade*

Point-to-point fibre architecture has effectively limitless bandwidth, and will 'future proof' the NBN. This will avoid the cost of retrofitting the passive elements of the network in the future, as would be the case for alternative technologies such as PON when they become capacity constrained.

Point-to-multipoint technologies provide a shared medium for customers. Sharing, limiting or rationing bandwidth poses the significant risk of dated, volume constrained networks in the short term, similar to the limitations of copper networks. The option to upgrade individual connections in response to the needs of individual users is also constrained in a shared point-to-multipoint network.

As indicated in the NBN Implementation Study[1]:

> "NBN Co should deploy the network in the most future proof way possible, not limiting the upgrade paths that could emerge to those seen today. The most effective way to accomplish this is to deploy a single fibre per home, described as the 'home-run' topology.[2]"

Also indicated in the NBN Implementation Study:

> "The pace of change in technology is rapid and accelerating, making it difficult to predict the innovation path for services and business models enabled by new long-lifespan broadband infrastructure. The decisions surrounding the deployment of the NBN need to account for this uncertainty to avoid constraining future innovation and market evolution.[3]"

Recent research by the OECD indicates:

> "Policy makers are not the best placed to predict the future demands that will be placed on network infrastructure. As a result, government investment should focus on infrastructure which can be upgraded easily and inexpensively to offer more capacity when new applications and services needing the connectivity appear. Building more potential for capacity into a project may be marginally more expensive in the short run but could significantly reduce costs and raise productivity in the long term, particularly if it helps avoid laying a second new network only a few years down the road.[4]"

Point-to-point is easier to deploy and upgrade. Users only need a standard low-cost media converter that they can purchase and upgrade themselves, just like a modem. PON requires complex proprietary Optical Network Termination units that the network operator has to maintain.

b. Competition

The NBN Implementation Study indicates that a point-to-point architecture is best suited for physical unbundling, providing the potential for a more competitive network when compared to a point-to-multipoint architecture. This will allow private active-layer operators to deploy their own active equipment using NBN Co's passive infrastructure. Private operators will not need to rely on the network owner to upgrade the active equipment, allowing them to be more responsive to their customer's needs. Such operators would need to be subject to similar wholesale-only open access requirements as those applied to NBN Co.

Recent research by the OECD indicates that point-to-point networks provide the highest potential for competition:

> "The benefits of this topology are that it helps promote competitive access, offers the highest capacity via a dedicated line to each user and allows operators to choose their own technologies when renting the line.[5]"

---

1 Undertaken by McKinsey-KPMG on behalf of the Australian Government
2 NBN Implementation Study, page 47-48
3 NBN Implementation Study, page 421
4 Reynolds. T. 'Working Party on Communication Infrastructure and Service Policy – The role of communication infrastructure investment in economic recovery', OECD May 2009
5 Reynolds. T. 'Working Party on Communication Infrastructure and Service Policy – The role of communication infrastructure investment in economic recovery', OECD May 2009

There are a number of difficulties with unbundling point-to-multipoint networks. One particular difficulty is that access and therefore competition can rely on the availability of sufficient space at splitter points. Where splitter points are too small or too dispersed access could be jeopardised and therefore competition would be diminished.

c. *Symmetry in the network*

Council's view is that the network must be symmetric (in terms of capacity) in both directions (natural for point-to-point fibre) as this is what the future of broadband demands.

Fibre networks are of greatest benefit when they allow for a broad range of business applications, rather than being just a vehicle for telecommunication. Many businesses require direct connection with their sites, offices, employees and other businesses, creating content such as video streaming which is particularly data intensive. Symmetric bandwidth will also be increasingly important for a range of applications in the health, education and transport industries where uploading and downloading data is of equal significance. The ability to upload is also a significant driver of innovation in home based businesses.

d. *Cost*

The NBN Implementation Study estimates that deploying a point-to-point architecture across the whole network would add up to $3 billion to the cost of the network, when compared with deploying a mixed topology of half point-to-point and half point-to-multipoint. This will be less if users could source, connect and maintain their own media converters, as they do now with modems.

The increased cost of a fully point-to-point network needs to be compared with the additional benefits that the network will provide. The increased cost is likely to be offset over the long term by minimising the cost of future network upgrades which will be required with point-to-multipoint infrastructure. The additional expenditure may also be justified by the additional competition, innovation and economic activity generated by a point-to-point network.

The NBN Implementation Study states that:

> "some level of cost premium is justifiable given the value of preserving the option for technological uncertainty and physical unbundling for competition.[6]"

Recent OECD research indicates that:

> "the cost difference between PON-based and point-to-point networks are relatively minor compared with the potential benefits from allowing competitive operators to take over an entire line.[7]"

In addition, densely populated areas such as major cities are forecast to grow faster, in regards to both economic activity and population. This will lead to faster increases in bandwidth requirements, and the subsequent need for earlier network upgrades.

Point-to-point networks will be a significant saving for both NBN Co and content providers, through a reduction in the number of access points. Instead of running their own fibre feed to the access point, or hosting their services at an access point, content providers simply

---

[6] NBN Implementation Study, page 51
[7]Enck. J. 'Working Party on Communication Infrastructures and Services Policy – Network developments in support of innovation and user needs', OECD December 2009.

upload or stream through the NBN over their regular fibre connection, which (being point-to-point) can accommodate data transfer speeds of 10Gb/s.

e. *Power consumption*

Previous arguments have stated that a benefit of PON based networks is that they consume less power than point-to-point. However, the Implementation Study states that the difference is equivalent to each user driving a single commute per year.[8]

Further, research from the Centre for Ultra-Broadband Information Networks (CUBIN) at the University of Melbourne shows that between speeds of 100Mbps and 1Gbps, power consumption for PON actually begins to exceed that for point-to-point networks.

f. *Exchange size*

One consideration raised in relation to point-to-point is that it requires more equipment at the point of connection at the exchange, resulting in larger exchanges. Exchange size is only a small factor in deciding the type of fibre architecture that should be adopted and this alone should not prevent selecting the technically superior point-to-point architecture and the range of opportunities it presents.

Investigations completed by Council have identified over 2,000 locations in Brisbane which potentially could be used for a network roll out. These land parcels include parks, buildings, shops and libraries where network equipment could be located or housed to act as an exchange or node location. The identification of these locations could assist NBN Co deploy a point-to-point network in Brisbane.

3. Ownership

A National Broadband Network does not have to be solely owned by one company (NBN Co), but could instead consist of numerous regional networks owned by different entities. This would allow networks to be developed based on the needs of a particular region. It would also allow network access prices to better reflect costs within a particular region. Capital cities such as Brisbane would benefit from a wholly point-to-point network, whereas less densely populated areas may want a different network architecture.

There is a need to ensure networks across Australia are interoperable, requiring basic network design standards to be applied across Australia. However, due to the evolving nature of telecommunications technology, standards should not stifle the adoption of, and investment in new technologies or methods of deployment. There should be an effective mechanism for dealing with proposals for new networks that deliver similar benefits to that of the NBN rollout and are broadly based on the same network principles.

---

[8] NBN Implementation Study – Exhibit 4-8, page 193