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TWEED SHIRE COUNCIL

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Mr Andrew McGowan
Inquiry Secretary
Standing Committee on Infrastructure and Communications
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Dear Mr McGowan

New Inquiry into the National Broadband Network

At its Confidential meeting of 15 February 2011 Council resolved to forward a submission to the Infrastructure and Communications Inquiry examining the capacity of the National Broadband Network. The submission follows:

The Significance of the NBN to the People of the Tweed Shire

The Tweed Shire is facing significant demographic challenges. Properly implemented, the NBN will play a key role in providing services and infrastructure to meet these challenges.

Population growth projections suggest that more than 35% of Australia's future population growth will occur from Coffs Harbour to Hervey Bay, driven mainly by the retiring, lifestyle seeking and baby boomer generation. This has a significant impact for all regions, and from Council's perspective, the Tweed in particular, as research indicates that 38% or 45,600 persons of the Tweed's projected population of 120,000 people will be over 65 years of age by 2031.

Research has identified the Tweed region as having a current Work Participation Rate (WPR) of 42% compared to Northern Rivers (NR) at 55%, NSW at 62%, SEQ at 62.7% and Hunter Valley at 59%. From the Tweed's perspective, this suggests the need to generate some 25,000 new jobs by 2031 if the Tweed is to achieve a moderate 50% WPR.

Addressing the challenges associated with managing and facilitating new and existing job creating business and investment growth, as well as the management issues associated with health and ageing, is very much dependent on having access to appropriate Telecommunications Infrastructure, as in optic fibre. That is why the NBN is of such importance to the Tweed Shire community and Council.

In terms of business and investment growth, there is good opportunity in the economic / business sectors identified by the case studies namely; agriculture, knowledge industries, tourism and the creative industry sectors. These sectors are all part of a suite of solutions which also need to include technology which encourages the relocation of commercial offices and head offices of major corporations to regional lifestyle regions like the Northern Rivers, where they have ready access to essential infrastructure such as, International Airports (Gold Coast Airport), The Sea and Air Ports of Brisbane and Telecommunications Infrastructure.

A Telecommunications Infrastructure Action Plan that identifies the urgent need for high speed broadband has been developed and adopted by Tweed Shire Council with support from Hon Justine Elliot, the Federal Member for Richmond.

NBN – Technical Capacity

Tweed Shire Council's submission focuses on NBN's capability to deliver "the optimal capacity and technological requirements of a network to deliver these outcomes". (section i) in the Inquiry Terms of Reference. Council strongly believes that the NBN's capacity to contribute to the other terms of reference fundamentally lies in successfully achieving point i). That is, ensuring there is a suitable broadband network and service provider infrastructure that can deliver all of the other services that the inquiry considers important.

To successfully achieve *i)* Council asserts that the NBN and the Federal Government need to establish and communicate clear policy directions for each of the following points:

1. Timeliness
2. Policy
3. Reliability and Resilience
4. Real-World Capacity
5. Affordability
6. Complementary Infrastructure

These five points are addressed below:

1. Timeliness

The big question to nearly all Australians is When?

NBN have not made any clear announcement on the national roll out of the NBN to exact locations. Specifically, when will a full NBN infrastructure including service providers be available to all of the residents in the Tweed Shire through both fibre and wireless delivery. This implies a fully disclosed roll out schedule for the Nation. This includes both wireless and fibre, and a timeline for key service providers on the NBN. It is vital that this timeline is publically available so that Council's and other corporate users can plan and implement new services and increase the capacity of existing services. The expansion of commercial content that Broadband can provide to the community will rely on capabilities of the NBN that are currently expressed by the Government but not the responsibility of NBN Co to deliver.

2. Policy

Key Policies and Protocols still need to be established to manage the longer term relationship between Councils' and the NBN. Key areas include:

- *Provision to Councils' of "works as executed" information using a defined GPS Co-ordinate standard;*
- *Integration with existing "Dial-before-you-dig" services;*
- *Standards for the easy detection of fibre-cable once laid.*

Information shown on the (NBN) website indicates that the national rollout of the new high speed broadband project represents the largest infrastructure development ever undertaken in this country. The website states that high speed broadband will be delivered to all Australian homes, schools and businesses, with at least 90% provided through the underground laying of fibre optic cabling.

While the project is to be applauded and supported, concern exists regarding the protection of the infrastructure after installation due to insufficient "as constructed" information being available on the location of the underground fibre optic cables. The website states that "the network will have appropriate levels of reliability, resilience and security" and that the network design will provide reliable and secure services

"consistent with the usual practice for other major telecommunications providers". Unfortunately the usual practice for telecommunication providers does not include accurate "works as executed" location of the installed service and this makes the cable vulnerable to accidental breakage from excavation or civil works.

Information available for underground services is obtained through "Dial-before-you-dig" (DBYD), a commercial national community service which is designed to prevent damage and disruption to the vast pipe and cable networks throughout Australia. These assets comprise essential services such as electricity, gas, communications and water. DBYD data is only as good as the data provided by the asset owners. In some instances the plan does not show offsets to property boundaries, position of pits or markers or any form of geographic coordinates sufficient to allow the cable position to be determined.

Optic fibre infrastructure, including cable, pit, conduit pipe etc may not have any ferrous material to allow easy above ground detection via magnetics. This means the precise position of the cable may be obscured, therefore requiring multiple physical examinations to locate.

A preferred scenario would be plans that show the general alignment of the optic fibre diagrammatically but also identifies pits and markers located along the cable.

Also, a number of methods can be employed to determine the position of the fibre optic cable once its general location has been indentified from the DBYD search results. Physical evidence such as pits or markers with plaques advising of offset distance and depth to the cable may be visible on the ground.

The most common method to locate fibre optic cables is by electronic detection. A transponder attached to the cable during installation can be detected through an electronic receiver above ground, thus determining the cable position. This is the safest and most accurate method currently used and provides a position on the ground above the cable and a depth.

Other methods that are commonly used but are significantly more expensive, include hydro vacuum excavation and ground penetrating radar.

While these methods often allow point determination of the underground cable position at a set location they are time consuming, expensive and not always successful or reliable. Physical evidence such as pits and markers can be difficult to locate, as the pits can be covered with soil and grass while the markers can rust and are often vandalised. Electronic detection provides reasonable results but is expensive as it requires engagement of specialist services. Hydro vacuum excavation and ground penetrating radar are expensive operations necessitating the engagement of specialists, and require a reasonably accurate prior knowledge of the cable location to be successful.

Even with specific point determination of position, there can be doubt on the cable location between points. The fibre optic alignment can be very irregular as it is not restricted to straight lines. Unlike other pipeline infrastructure such as water and sewer, the optic fibre cable has a high degree of flexibility and can be bent around obstacles, horizontally and vertically, to suit the circumstances. The result is that it cannot be assumed that the cable is in a straight line between located points.

Local and state authorities require accurate "work as executed" plans for all new infrastructure installed within their respective areas of control. Typically details are required on the type and correct spatial position of the service installed, with data

available in digital format on an approved coordinate system for use within a Geographic Information System (GIS) environment.

The adopted grid coordinate system in Australia is the Map Grid of Australia (MGA) derived from the Geodetic Datum of Australia (GDA). Most, if not all, state departments and local authorities operate their GIS networks based on MGA coordinates. This provides a common link for sharing and providing data between organisations, as information positioned correctly on MGA can be readily added to an existing GIS operating in an MGA environment. The field data capture process for "work as executed" surveys is usually undertaken using Global Positioning System (GPS) survey equipment capable of determining MGA coordinates. Modern GPS survey instruments offer a fast, cost effective means of precise data capture and can provide accurate results in digital format suitable for incorporation into a GIS environment. The benefits available from "work as executed" surveys include:

1. Data collected can be utilised within a GIS environment;

2. The resulting information is spatially correct and can be viewed in its correct position relative to other spatially correct data - eg underground services with respect to property boundaries;

3. Accurate calculations can be made between the data allowing distances and offsets between structures to be determined;

4. The position of assets within the GIS environment can be determined on the ground by setting out the coordinates using GPS technology. This is of huge importance in locating underground services that no longer have any evidence of position visible on the ground. The information can be extracted from the GIS and uploaded directly to a GPS survey instrument. This information can then be set out in the field using the GPS to accurately position the asset on the ground;

5. Data can be shared between organisations electronically in digital format via email or the internet.

The adoption of a similar system to produce accurate "work as executed" information for the NBN project would greatly assist in protecting the underground cabling from accidental damage.

While the legislative onus is on individuals or organisations to undertake adequate investigation to determine fibre optic cabling location prior to works, the overriding consideration should be to protect the infrastructure by the most practical methods available. The most obvious of these is to have good records of the cabling position available through the use of GPS technology and the production of accurate "work as executed" surveys. Modern GPS survey instruments can position data to a high degree of precision and by adopting a process of recording all changes of direction for the cable as it is laid, an accurate three dimensional model could be created. With the data available in digital format designers and contractors could then readily determine the location without the need for extensive field investigation. When required, field position could be determined by locating the previously recorded coordinate positions on the ground using a GPS instrument. Any additional investigation such as conventional potholing or hydro vacuum excavation could then proceed at the marked locations with a high degree of confidence.

The security and protection of the broadband network will be in jeopardy while ever the accurate location of the underground fibre optic cabling is not readily available. Events in the Sydney CBD where damage from excavation to underground services effectively

shut down business demonstrate how critical it is to have the services accurately positioned. The existing practice of relying on diagrammatic details on DBYD plans combined with expensive, specialist location services is not suitable for such a valuable resource. The technology is available now to accurately capture the cable position as it is being laid and then have the results available in digital format for all users to access. This provides an affordable means for all interested parties to locate underground fibre optic cable with a high degree of confidence and allow designers to ensure future works can be placed to avoid potential conflict with the cabling. With the availability of cost effective GPS technology and the extensive use of digital spatial data within a GIS environment, it is desirable that a state of the art project such as the NBN rollout should utilise and adopt current best practice methodology for service location.

Council believes that through simple policies and standards, the Commonwealth and State Governments together with NBN Co can make a significant and immediate improvement to service availability.

Through the NSW Department of Planning, review the standard definitions of a "Public Utility" within the NSW Planning framework.

The current definition of "Public Utility infrastructure" is old terminology and relates to when electricity, gas and Telecom (Telstra) were public owned utilities. With privatisation and corporatisation, this is no longer the case and the terminology should change to "for purposes of public infrastructure". The current telecommunications industry is extremely competitive and involves many individual companies. The definitions and its use in the Standard Instrument should reflect this situation.

New mobile telecommunications infrastructure needs to be incorporated into the definition of "for purposes of public infrastructure" in the NSW Planning framework.

As mobile broadband services continue to evolve and improve, they will continue to fill a gap where fixed line broadband is unavailable. Mobile telecommunications facilities are also becoming essential public infrastructure as small smart phone devices such as Apple's iPhone become more popular as a way of accessing online services and an essential business tool.

In most local government areas, the most contentious telecommunications infrastructure, are mobile base stations and mobile towers that are proposed in newly developed residential estates. Community concern and objection can lead to delays in carriers gaining approvals and ultimately delays access to mobile broadband services and poor mobile voice coverage for these communities. The problem will continue to exist while large scale developments do not need to forward plan or treat mobile voice and broadband as a critical upfront public infrastructure. Most of the public angst and public opposition could be easily alleviated if mobile or telecommunication tower precincts were identified at the master planning, rezoning, concept planning and/or subdivision stages. In this way residents purchasing into these estates would be fully aware of the exact locality of these utilities and could make decisions as to the acquisition of land in full knowledge of current and future infrastructure.

3. Reliability and Resilience

Widespread adoption of the NBN by the general public and information intensive businesses is dependent upon having a Reliable and Resilient delivery of services via the NBN.

A key to this is the resiliency / redundancy of the NBN in rural and regional Australia. The NBN backbone and all the infrastructure components must not introduce single

points of failure that would lead to an isolation of a community through simple failures, such as construction accidents, flood, storm or fire. If this is to occur then Council will be unable to attract information intensive businesses to our region. Also Council's community would not be able rely on critical services being delivered over NBN such as health care, defence, emergency services and education.

Council is concerned that the NBN backbone architecture for regional Australia is not based upon a grid or mesh structure but relies on single pathways from major centres to many regional centres. Moreover, NBN Co has not published its standards for providing redundant equipment for network access points so as to avoid single points of failure within our regional community.

This also applies to the providers of services on the NBN backbone. Standards need to be delivered and incentives provided to ensure that these too are resilient otherwise the overall availability of the services delivered by NBN will not be what is required.

Given the enormity of the national investment in the NBN, it would be a serious flaw if the Nation was to end up with a network that was not resilient, did not deliver reliable services and could not be relied upon in times of Emergency.

This is even more critical as land line voice services are replaced by NBN provided Voice over IP (VOIP) services. The recent events in Queensland have shown how important it is in times of emergency to have multiple communication pathways to the communities. The abolition of the current copper network in which households are not dependant on electricity supplies for the delivery of phone services will be a critical limiting factor in disaster response scenarios. As an example, Council heard multiple radio broadcasts for Brisbane residents affected by grid shutdowns being requested to find old analogue handsets and plug into the copper network. Similarly during Cyclone Yasi telephone communication often remained available even though electricity supply was lost. NBN Co needs to guarantee emergency systems will be embellished and not restricted.

A related planning point to this is the use of overhead cabling by NBN Co for residential roll out in cyclone / storm affected areas. Underground cabling provides significant benefits in these areas and should be mandated as a National Emergency requirement.

4. Real-World Capacity

Widespread adoption of the NBN by the Tweed community and information intensive businesses depends upon the "real-world" performance of the services delivered over the NBN with our shire, not just the NBN headline download speed.

While the capacity of the fibre network being rolled out is significantly in advance of current capabilities, the lack of strategic direction given by the Government and NBN Co to service providers has led to concerns that actual delivery speeds may be significantly less than the headline speeds currently being advertised.

Effective capacity of the NBN is dependent upon the slowest service provider in the service provision chain of the network for the application being used. This could occur because of:

- The base NBN infrastructure underperforming due to any "cost cutting" by NBN to maintain its investment case rate of return;
- Higher level service provision being slowed through the failure of ISP's to invest sufficient funds;

- The sovereign risk issues associated with the extended timeframe of the NBN rollout, leading to a lower capability network then currently planned.

Council is very concerned about regional availability of sufficient capacity to support information intensive industries and services, for example cloud computing, multi-media and video conferencing. While the fibre connection is capable of 100Mb + speeds there has been no clear guarantee that individual connections will be available up to that speed in our regional area.

5. Affordability

Widespread adoption of NBN delivered services to the Tweed community is highly dependent upon the affordability of broadband delivered services and the adoption of policies to promote this affordability.

Analysis of the age structure of Tweed Shire in 2006 compared to New South Wales shows that there were a larger proportion of people in the older age groups (60+). 29.4% were aged 60 years and over, compared with 24.0% and 18.6% respectively for New South Wales.

This age group will benefit significantly from using broadband delivered services to overcome mobility issues by using services such as:

- health care in the home or local community centre;
- telemedicine to access metropolitan-based medical specialists;
- telecommuting via video link;
- maintaining their connection to the community through community forums and webcasting services;
- delivery of distance education.

These types of services often require greater "upload" bandwidth than is being provided by the NBN basic service (1 MB) and so will require the purchase of premium or business services.

However, given the pressures on retirement incomes this group can least afford the price of broadband services at the speeds required to support these type of applications. Council already has examples where this community group is becoming dependent upon free access to the internet using Council provided facilities and this is only expected to increase.

Council is particularly interested in policies that would help facilitate this particular demographic to access affordable high-speed NBN connections (especially upload) and related services.

6. Complementary Infrastructure

Our community needs more than just the NBN. The NBN delivers broadband to fixed points but many our telecommunication needs are mobile. Widespread adoption of internet-based services is also dependent upon the ability to deliver them to mobile devices. We need policies to accelerate the delivery of mobile data solutions outside the NBN.

While the capacity of the NBN network being rolled out is significantly in advance of current capabilities, it is specifically targeted at the home or business premises – a fixed point solution. However, many of the potential improvements to Council's service delivery rely on mobile data solutions for such services as:

- Field Force enablement
- Emergency contact
- Personal health and security monitoring
- Mobile Asset tracking.

In addition, the Tweed Shire is a significant tourist destination and many of these tourists will expect to use their personal mobility solutions (mobile telephony and data) while holidaying in the Tweed Shire. Short-term renters will also seek to use mobile data services in place of fixed point connections.

The uncertainty regarding the NBN for the past few years has seen telecommunications companies slow-down or defer their mobile network investment plans, especially in regional areas. As a result we have not seen the improvements expected in regional mobile telephony and data coverage.

The Tweed Council requests that the Commonwealth Government urgently review its policies so as to increase the incentives for commercial operators to expand and accelerate the roll out of regional mobile telephony and data services.

Potential benefits of the NBN to the Tweed Shire

Council believes that the points a) to h) are services which will enhance the social, environmental and economic well being of the Tweed community through the successful implementation of the NBN. Particular areas or organisations that would benefit from the NBN sponsored broadband listed in relation to each of the specific Terms of Reference points of the Inquiry:

a) Public Administration
- Murwillumbah and Tweed Heads Court Houses
- Tweed Shire Council Administration Centre – Murwillumbah and Tweed Heads
- NSW Firearms Registry
- NSW State Offices, Murwillumbah
- State and Regional Development
- Emergency Services

b) Health
- Murwillumbah and Tweed Heads Hospitals
- Tweed Heads Day Surgery
- Opportunities to establish 24 hour clinics
- Dental surgeries

c) Education
- High and Primary Schools
- Murwillumbah and Kingscliff TAFE
- Southern Cross University - 3 Campuses
- Opportunities to establish Global Learning Villages

d) Environmental Management
- National Parks and Wildlife Offices
- Catchment Management Authorities

e) Employment
- 40Ha undeveloped employment land Chinderah – 2000 jobs
- 86 Ha undeveloped employment land Pottsville – 5000 jobs

f) Business
- Tourist and Conference Industry Tweed Heads / Kingscliff
- Business Chambers – Tweed Heads / Kingscliff / Pottsville / Murwillumbah
- Clubs Industry – Tweed Heads
- Boral – Murwillumbah
- Racecourse – Murwillumbah Jockey Club, Border Park Racecourse

g) Research and Development
- Southern Cross University
  - Surfside Campus
  - Lakeside Campus
  - Riverside Campus

h) Community and Social Benefits
- Tweed Shire Council Community Centres
- Aged Care facilities
- Churches
- Respite
- Murwillumbah, Tweed Heads and Kingscliff Police Stations
- Murwillumbah Fire Station
- Murwillumbah, Tweed Heads and Kingscliff Ambulance Stations
- Non-Government Organisations (NGOs)

Should you require any further information, please contact the Director Technology and Corporate Services,

Yours faithfully

Mike Rayner
GENERAL MANAGER