Submission 213
Date received: 22/03/2011

Australian Government
Department of Infrastructure and Transport

Secretary

File Reference: 07089-2010

The Hon Sharon Bird MP
Chair
Standing Committee on Infrastructure and Communications
Parliament House
CANBERRA ACT 2600

Dear Ms Bird

Submission to the Inquiry

Thank you for the opportunity to provide a submission to the House of Representative Standing Committee on Infrastructure and Communications inquiry into the role and potential benefits of the National Broadband Network (NBN).

The Department of Infrastructure and Transport is playing an active role in ensuring Australia's competitiveness, innovation and growth through strong research, reform and strategic investment in nation building infrastructure projects.

The Department's submission examines the potential application of the NBN, focussing on key areas relevant to the Infrastructure and Transport portfolio, namely, smart infrastructure, intelligent transport systems, Australian cities and transport security.

I hope the submission will be both informative and of assistance to the Committee.

Yours sincerely

Mike Mrdak

20 March 2011

GPO Box 594 Canberra ACT 2601 Australia • Telephone: 02 6274 7573 • Facsimile: 02 6274 8166
Website: www.infrastructure.gov.au • ABN 86 267 354 017

Submission 213
Date received: 22/03/2011

Australian Government
Department of Infrastructure and Transport

HOUSE STANDING COMMITTEE ON INFRASTRUCTURE AND COMMUNICATIONS

Inquiry into the role and the potential benefit of the National Broadband Network

Submission by the Department of Infrastructure and Transport

March 2011

Submission 213
Date received: 22/03/2011

Department of Infrastructure and Transport

Introduction

The Department of Infrastructure and Transport contributes to the wellbeing of all Australians by assisting the Government to promote, evaluate, plan and invest in infrastructure and, by fostering an efficient, sustainable, competitive, safe and secure transport system.

The Department provides policy advice to the Minister for Infrastructure and Transport and delivers a variety of programs on behalf of the Australian Government. The Department conducts research and analysis; provides safety information and advice; and performs regulatory functions.

The development of the National Broadband Network (NBN) provides the Department with the opportunity to more actively support the implementation of intelligent information communications technology (ICT) applications capable of meeting the challenges posed by evolving transport systems and urban infrastructure.

The Department's submission examines the potential application of a nationwide rollout of the NBN, focussing on four key areas relevant to the Infrastructure and Transport portfolio, namely, smart infrastructure, intelligent transport systems, Australian cities and transport security.

Smart Infrastructure and Intelligent Transport Systems

Smart infrastructure involves combining ICT with infrastructure to improve the way in which that infrastructure can function. It is used to describe technical approaches to infrastructure that are more efficient and environmentally more sustainable. Smart infrastructure emphasises flexibility, allowing us to meet multiple goals, including better energy efficiency and the development of safer, more intelligent transport systems. The NBN, when established, will support better access to more advanced levels of ICT and will potentially increase the benefits of embedding smart technology into Australia's infrastructure.

A recent Access Economics report estimated that smart technologies and systems in five key infrastructure areas, namely, electricity, irrigation, health, transport and broadband communications, could increase gross domestic product (GDP) by between $35 and $80 billion over the first 10 years of implementation.

The report also showed that the adoption of smart integrated transport systems, together with regulatory and governance reform, would boost the net present value of GDP by between $12 and $26 billion over a ten year period, and increase jobs by 30,000 in an economy operating at less than full employment.[1]

Smart Infrastructure Awards

In November 2009, the Hon Anthony Albanese MP, Minister for Infrastructure and Transport asked the then House Standing Committee on Infrastructure, Transport, Regional Development and Local Government to inquire into and report on smart infrastructure.

The Committee subsequently announced a smart infrastructure conference, *ThinkSmart 2010,* convened in Canberra in March 2010. The conference focussed on ways to maximise the potential benefits of embedding smart technology into infrastructure.

At the *ThinkSmart 2010* conference the Minister announced the inaugural Australian Smart Infrastructure Awards for innovative, technology-driven solutions to infrastructure bottlenecks and urban congestion. The awards were presented at the *IPA Partnerships 2010 Infrastructure & Investment Conference* in

[1] Access Economics report for IBM, May 2009, *The economic benefits of intelligent technologies*

Melbourne in August 2010 and were selected from entries received from across government, academia, business and industry.

The 2011 Australian Smart Infrastructure Awards was hosted by Infrastructure Partnerships Australia and presented alongside the National Infrastructure Awards 2011 on 17 March 2011. The Awards continue to showcase excellence in the design, delivery and use of smart infrastructure across *Infrastructure Australia's* national priority areas – broadband, energy, international gateways, rail freight, cities and Indigenous infrastructure and water.

Smart Grid Smart City

The Australian Government's commitment of up to $100 million to develop the Smart Grid, Smart City demonstration project in partnership with the energy sector is an example of an innovative Smart project which may benefit from NBN technology. This initiative will gather robust information about the costs and benefits of smart grids to inform future decisions by government, electricity providers, technology suppliers and consumers across Australia.

A smart grid works by combining advanced communication, sensing and metering infrastructure with the existing electricity network. Smart grids have the potential to improve the efficiency of Australia's electricity sector and transform the way energy is used in our homes and businesses.

In the digital age, connectivity is about more than cars, buses and trains and the implementation of appropriate technology will support a systems approach to infrastructure planning, design and delivery. The Australian Government's investment in the NBN will provide a strong foundation for the ongoing research and development of new technologies and can support the expansion of smart infrastructure applications across all forms of infrastructure.

Advanced Train Management System

A further example of an Australian Government funded smart infrastructure project is the Australian Rail Track Corporation's (ARTC) Advanced Train Management System (ATMS). The ATMS is designed and being trialled to support ARTC's objectives of improving rail network capacity, operational flexibility, train service availability, transit times, rail safety and system reliability. The system will replace high maintenance geographical based track side signalling infrastructure with "rolling virtual proximity" signalling which will utilise Global Positioning System (GPS) technology and high speed broadband data to define safe travelling distances between trains and provide real time information to drivers and train control centres.

The ARTC is currently trialling the ATMS between Port Augusta and Crystal Brook in South Australia with half of the $90 million cost ($45 million) provided by the Australian Government as part of the Nation Building - Economic Stimulus Plan. If proven successful, ARTC will consider full implementation across the rail network that it manages.

Benefits of the ATMS include increased capacity of existing rail infrastructure, increased train speeds and reduced greenhouse gas emissions as trains will be able to maintain safe distances at higher speeds and will no longer be required to come to a complete stop and proceed from signal to signal along heavily used routes. The NBN will support and advance the development of smart infrastructure projects such as the ATMS.

Intelligent Transport Systems

An area the NBN may have real utility is in relation to Intelligent Transport Systems (ITS). ITS aim to improve the road efficiency, road safety and driver convenience through the integration of advanced ICT into transportation infrastructure and into vehicles.

ITS include stand-alone infrastructure applications such as traffic management systems, as well as cooperative ITS (C-ITS) applications involving vehicle to infrastructure and vehicle to vehicle communications. Some examples of these technologies include:

- adaptive traffic control systems, to provide priority for road-based public transport vehicles
- freeway management and information systems
- in-vehicle navigation and information systems
- advanced traveller information systems.

The NBN has the potential to increase the telecommunications capacity that would underpin a broad range of ITS applications, including C-ITS applications currently in use or under development. This particularly relates to vehicle to infrastructure applications, whereby data is transmitted between vehicles in motion and roadside infrastructure that could be connected to the NBN.

The likely benefits of C-ITS include safety, traffic and productivity management gains. Broader benefits include the potential to reduce the number of crashes as vehicles can sense and communicate what is happening around them; road users have detailed information on travel options allowing them to make a more informed choice; and network operators have full knowledge of the status and condition of the assets within the road network.

There are a range of applications that fall under the C-ITS banner which may benefit from the NBN. These include:

- Improved Traffic Management Systems: managing the transportation system with knowledge of real-time location of every vehicle using the system including pre-emption at traffic signals for priority vehicles
- Access to Information En-route: access to information such as weather en-route
- Improved Incident Response: improved response to incidents and traffic flow restoration times.

In Perth, the Australian Government is investing $350 million to improve the city's major freight and passenger corridors. The Kwinana Freeway in Perth is an example of an Australian Government funded project that utilises intelligent transport systems technologies to improve and enhance the road and freight network. ITS are an important component of this project and will include the installation of cabling and electronic signs on a number of major urban links. The investment of ITS will optimise the benefits of wider upgrade and provide the capacity for new applications to be installed as they are developed in the future.

The likely benefits of next generation ITS, especially cooperative systems, are expected to be substantial. This is largely because these systems are able to "see further" to generate real-time information, and provide drivers with more time and advice to support active safety, congestion mitigation and sustainable driving.

Future ITS opportunities will depend on short range roadside and vehicle-to-vehicle communication, via satellite and wireless technology, being linked back to road network control by optic fibre. For that reason the NBN will be integral to future ITS delivery and the Department is actively engaged in further developing its understanding of how the NBN can contribute and add value to ITS technologies and their application.

To ensure a coordinated approach, the Department is working with the states and territories on a national policy framework for the deployment of ITS in Australia, for consideration in 2011 by the Australian Transport Council.

On 19 August 2010, the Standing Committee on Transport (SCOT) endorsed the preparation of a strategic framework for ITS, for consideration by SCOT in 2011. The Department is actively involved in the

development of this ITS strategic framework, working with the Austroads Cooperative ITS Steering Committee, and is keen to explore any opportunities the NBN may offer in the future application of ITS.

Australian Cities

The Department's Major Cities Unit has recently released a discussion paper titled, *Our Cities – building a productive, sustainable and liveable future*. This paper outlines the Australian Government's aspirations for building productive, sustainable and liveable cities. It concentrates on the 18 major cities in Australia with populations over 100 000 people. These cities are integral to our economy, and are where three-quarters of all Australians live.

Productivity

Cities are centres of economic activity where the workforce, industry and institutions that support their activity are concentrated. How efficiently our cities connect people, industries and other businesses and markets – and how effectively their economic and human capital is utilised – can affect the productivity performance of our industries and their ability to contribute to national productivity growth.

The NBN has the potential to help connect people and businesses, both within cities and between them, on a national and international scale. It will improve the efficiency and effectiveness of information, knowledge and resource sharing, all of which are vital to the Australian economy.

In reference to the Australian Government's aspirations for cities, outlined in the *Our Cities* discussion paper, the NBN can assist in improving the productive capacity of our cities by:

- improving labour and capital productivity by facilitating economic activity
- improving the efficiency of existing and new infrastructure, including transport and communications, particularly if combined with other technologies and smart infrastructure
- fostering innovation, knowledge sharing and high-value employment
- improving economic opportunity.

Sustainability

Our rapidly growing urban populations are placing pressure on the environment through demand for water, energy, land and other resources, and through the production of wastes including greenhouse gas emissions. Our cities and their populations are also vulnerable to climate change and catastrophic events and any planning, technologies and infrastructure that can improve our resilience during and after such events is likely to be of benefit.

By improving digital sharing of information and resources, the NBN has the potential to reduce the need for physical travel and transportation. With cheaper and easier access to videoconferencing, higher speed internet and other associated IT infrastructure, it may make 'telecommuting' (working remotely or from home) more attractive, thus reducing the need to travel to work and reducing peak congestion. It may also reduce the need to travel between cities to attend meetings, training programs and seminars. And it may allow businesses to locate outside of the traditional central business districts, potentially reducing the overall need to travel for employees, customers and goods.

Reducing the travel demand in our cities would have significant environmental benefits, largely because transportation in Australia is a major source of carbon emissions and pollutants. In addition, the NBN, when combined with other technologies and data collection, will help track resources more efficiently with less wastage and pollution, allow fast and efficient decision-making in times of crisis, and help to predict complex future outcomes, for example flooding and storm events.

The NBN can assist in making our cities more environmentally sustainable by:

- encouraging planning and the development of more energy efficient, low carbon urban forms and transport systems
- encouraging more efficient use of resources, including energy and water
- assisting in the collection and sharing of national data, helping to reduce resource consumption and managing risks such as climate change and security of water, energy and food
- potentially helping to deliver services and goods to communities and businesses more sustainably, particularly when combined with other technologies and infrastructure such as smart infrastructure.

Liveability

Liveable cities offer a high quality of life, and support the health and wellbeing of people who live and work in them. Liveable cities are socially inclusive, affordable, accessible, healthy, safe and resilient. They provide choice and opportunity for people to live, and raise their families, to their fullest potential.

The NBN can assist in making our cities more liveable by:

- helping to provide more equitable access to a range of employment and educational opportunities, services and facilities
- reducing the need to travel
- improving social inclusion and redressing spatially concentrated social disadvantage.

Combined with appropriate planning, technologies and infrastructure, the NBN may help people to spend less time commuting, freeing up time for family and personal matters and more opportunities to walk, cycle or catch public transport to work. This has health, community and social benefits in addition to the economic and environmental benefits outlined above.

Conclusion

The Department is actively working to meet the infrastructure and transport challenges Australia faces now and into the future. The NBN has the potential to better connect people, business and governments within cities and regional areas on both a national and international scale.

The NBN can assist in the productive capacity of our cities by improving and facilitating economic activity; improving the efficiency of existing and new infrastructure; and by fostering innovation and knowledge sharing.