



# National Broadband Policy, Papua New Guinea

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Draft

22<sup>nd</sup> April 2013

# 1. Introduction

## 1.1 Background

Most countries in the world are advanced in the serious and sustained attention that they are giving to the evolution of Information and Communications Technology (ICT), especially broadband, and are developing policies and plans to ensure that their respective societies and economies receive the benefit of these technologies and applications at the earliest time.

Most countries, irrespective of their stage of economic development, recognise that ICT and particularly broadband technologies have the capacity to transform social interaction and economic processes. They are critical for social inclusion and economic fulfilment in the future.

The Government of PNG has decided that high quality, affordable broadband services are essential to future social and economic development in PNG. PNG has a large and dispersed population, with a substantial proportion adopting traditional and semi-traditional lifestyles at the edge of the cash economy. On the other hand, PNG is subject to substantial movement of peoples from villages to major towns and cities in order to be part of a modern economy and to seek paid employment. PNG needs to ensure that its people have access to information and other resources to enable new and innovative skills development across the whole economy and society. Without a widespread upskilling of its people PNG will find it difficult to be a fully engaged, competitive and effective part of the global economy.

To be fully engaged in this way, PNG needs to put in place a robust framework to capitalise on existing and new technologies which facilitate innovation, enhance competitiveness, increase productivity and economic development, to promote greater social inclusion, and to rely on the sustainable use of broadband services in the future. There are appreciable risks in not adopting such policies, including the risks that PNG will not gain international competitive advantage, will be regarded as a country on the periphery of the information age and will attract less investment than it otherwise might.

This National Broadband Policy has been developed to align with the broader planning commitments and national aspirations of the Government of PNG, such as are expressed in *ICT Vision 2050 and the Medium Term Development Strategy*.

## 1.2 What is Broadband?

Broadband is the name given to always on, high speed access services that provide connection to the internet and to other information services.<sup>1</sup>

There have been various attempts, over time, to define broadband in terms of a threshold minimum download capacity. This approach has problems, not the least of which is that perspectives on the minimum capacity needed for a service to qualify as broadband have changed over time, and will continue to do so in future.

To be effective, a national broadband policy needs to sustain broadband services at capacities that are appropriate to the applications required. Therefore to define a minimum download speed is merely to indicate the lowest capacity service that will be counted as broadband,

The importance of broadband is in terms of the applications and services made available. Bandwidth capacity is only important in so far as it enables specific applications and services to be used. For the purposes of this Policy, entry level broadband means services that have a minimum download speed of 512kilobits per second (kbps) as a starting point. The minimum download speed that is recognised as broadband will undoubtedly increase over time. Therefore the Policy makes provision for the National ICT Authority (NICTA), in coordination with the Department of Communications and Information Technology and other relevant stakeholders, to increase entry level capacity definitions as required.

The need to define an entry level broadband service arises in many circumstances. Affordability concepts are especially associated with entry level services, and the universal service scheme, if it is to aid in broadband penetration and service take-up, will concentrate on this level for funding and registration. Services with capacities below the minimum entry level may continue to be provided but will not count for target setting and performance assessment.

## 1.3 Benefits of Broadband

The availability of high quality, affordable broadband services in PNG is essential to facilitate innovation, economic growth and development, and to reinforce social inclusion and cultural norms. The benefits of broadband continue to grow. They include:

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<sup>1</sup> A range of definitions are possible as discussed in Chapter 2 of the ITU's Broadband Commission report, *Broadband: A Platform for Progress*(May, 2011). However the recommended working definition at page 19 of that report is the approach adopted in this Policy, namely: "The Broadband Commission sought to focus on considering some of the core concepts of broadband as an always-on service (not needing to make a new connection to a server each time a user wants to go online), and high-capacity: able to carry lots of data per second, rather than the particular arrival speed of the data." ([http://www.broadbandcommission.org/Reports/Report\\_2.pdf](http://www.broadbandcommission.org/Reports/Report_2.pdf))

- Economic transformation at national, sector and firm levels, and the necessary adaptation of public and private sectors to meet the challenges and imperatives of operating on the global economy. Broadband will transform the way in which transactions are conducted and will redefine the value and supply chains, and the relationships of the parties in such chains
- Productive efficiency as business and government processes are made more effective. In particular broadband will help improve access to information and the cycle times for various processes in the economy. Transactional costs will be decreased and wastefulness associated with existing processes will also be reduced
- Dynamic efficiency as new processes and innovations are encouraged, with innovation leading to further development and improvement
- Social inclusion as people build and reinforce communities online, and support the reach and interactions of individuals and groups
- Unlimited opportunities for personal development and acquisition of new skills
- Greater acquaintance and experience of the external environment in both education and leisure
- Reinforcement and preservation of culture and cultural norms
- Development of new products, services, and applications to enrich the cultural, social and business life of PNG
- Improved public administration and service delivery through the development of e-government online transactions to improve quality save cost and increase access and convenience. Government services will be able to accessed by more people, more efficiently.

## **1.4 International competitiveness**

The International Telecommunication Union (ITU) regularly assesses the level of ICT development of its members and ranks countries on a composite index, the ICT Development Index (IDI), which includes measures of access, usage and skills.

In the 2012 publication (the date of the most recently published index based on 2011 data), the ITU ranked PNG 142 out of a total of 155 countries in terms of ICT development. This had slightly improved in the result for a year earlier. From a regional perspective, PNG ranked 30 out of the 30 countries of Asia and the Pacific. These rankings suggest that PNG has some way to go to gain the full benefits of ICT in general, and of broadband in particular, compared to other countries regionally and internationally. To become more internationally and regionally competitive PNG needs to move forward and close the gap with leading countries, particularly in Asia.

On the domestic front, the level of ICT exposure has been increasing rapidly since the introduction of competition in 2007 and is set to increase further in the period ahead, including an increase in internet usage and in broadband access. Appendix 1 shows

the level of ICT penetration in PNG in the past five years with almost all indicators showing an upward trend. Mobile service penetration has grown substantially in recent years, driven by robust competition and network rollout to meet licence coverage obligations, with some substitution for fixed services. However increased service deployment and take-up has occurred in most of the countries surveyed by the ITU over the same period, so a substantial effort is required to ensure that national competitive advantage is maintained and improved. In this field, to do nothing is to go backwards and even moderate efforts will lead to standing still in the “leagues tables” that result from the ITU’s evaluations of country-by-country performance.

## **1.5 Policy Scope and Practical Focus**

This National Broadband Policy provides an over-arching framework with settings to ensure that demand-side and supply-side aspects of broadband infrastructure, applications, services, access and usage are best optimised to meet the objectives and targets that the Policy and associated Strategic Action Plan contain. The Policy is a major part of overall national ICT policy and is consistent with the *ICT Vision 2050*.

The Policy recognises that the resources available to the PNG Government are finite and that a substantial part of the broadband burden will need to fall on the private sector. The engagement and involvement of the private sector is a policy preference in any case, but is underlined by the constraints on Government resourcing. Within Government the emphasis will be on obtaining high levels of efficiency in investment, with efforts to preserve resources and keep costs down. This emphasis will not change during the course of the current Policy and associated Strategic Action Plan.

The Policy itself is necessarily pitched at a high level, consistent with settings that are intended to remain substantially in place for the longer term. Although the Policy requires regular review and possible adjustment, as do all national policies of this type, it is not expected that the direction of the policy or even the various emphases will change over the short to medium term. Practical focus, with emphasis on specific targets and measurable deliverables, is provided by the associated Strategic Action Plan. This document will also need regular review in light of changing circumstances in PNG, and is much more likely to require change as a result of such reviews than the Policy document.

## **1.6 Broadband - A Dynamic Policy**

Broadband development is occurring in a dynamic social, market and technological context. The opportunities, needs and potential solutions are changing rapidly. Although the settings are intended to have a long term perspective, National Broadband Policy needs to be flexible and adaptive to reflect the pace of change and ensure that the best outcomes are being delivered in PNG at any point in time. This

policy is a living policy, and will be reviewed and revised regularly to ensure its maximum currency and effectiveness for the benefit of PNG.

## 1.7 Acknowledgements

The contributions and suggestions that have been made by various ministries, government agencies and participants in the PNG telecommunications industry to the formulation of this draft have been extremely valuable and much appreciated. Indeed, they are a necessary part of the formulation of a successful broadband policy, which needs widespread support and ownership. In particular the enthusiasm and contributions of all stakeholders at the Industry Workshop held on 22 November 2012 in Port Moresby was most appreciated. Further contributions from all of these sources will be appreciated in the future as the policy is reviewed and shaped to better serve the country and its aspirations.

## 1.8 Glossary of terms

As used in this Policy and associated Strategic Plan of Action, the following terms have the meanings shown:

- **Broadband** Refers to high speed, always-on communications access services
- **Department** Department of Communication and Information Technology (unless the context suggests otherwise)
- **Entry Level Broadband** Refers to the minimum download capacity associated with a service that will entitle the service to be considered as broadband for policy purposes in PNG
- **Government** Refers to the Government of the Independent State of PNG
- **ITU** International Telecommunication Union
- **Minister** Minister for Communication and Information Technology (unless the context suggests otherwise)

- NICTA National ICT Authority
- Plan Means the Strategic Action Plan associated with this National Broadband Policy, unless the context suggests otherwise
- Policy Means this National Broadband Policy, unless the context suggests otherwise

## **2. National Development Objectives for Broadband**

The development objectives for broadband services are aligned to the Government's vision for the economic and social development of PNG. That vision has been expressed forcefully in *ICT Vision 2050*. Consistent with that vision,, national development objectives include:

- Good governance
- Growth in the national economy across all sectors
- Deployment and construction of physical infrastructure to support service delivery, especially in regional and rural areas
- Private sector development and employment
- Capacity building and human resources development

The National Broadband Policy seeks to support those objectives and to transform society and the economy across a large front, so that resulting benefits are extended to all PNG people and communities. Broadband has the potential to substantially contribute to specific sector goals as well.

The specific objectives of the National Broadband Policy are set out below:

### **2.1 Achieve higher economic growth and economic efficiency while ensuring sustainability**

- Contribute to the increased economic welfare of PNG and its people
- Create sustainable employment opportunities and enrich and enhance jobs
- Make PNG more attractive for commercial activity and investment
- Achieve higher economic efficiency in terms of transactions, processes and effectiveness.

### **2.2 Promote social growth and cohesion**

- Advance social inclusion and cohesion in all ways, especially through modern communications
- Preserve PNG's cultures and traditions through the use of new technologies
- Promote community ownership and support for continued and improved broadband services through improved access and usage
- Provide high speed broadband access for all communities, schools, homes and businesses in PNG



## **2.3 Enhancing Public and Private Sector Efficiency and Performance**

- Improve efficiency, effectiveness and reach of government services through specific eGovernment initiatives
- Provide broadband enhanced business and community services by both the private and public sectors
- Improve efficiency and productivity of all sectors of the economy

## **2.4 Facilitating ICT and general education through broadband**

- Deliver broadband-enhanced education in all schools including the development of relevant ICT skills at all educational levels resulting in curriculum extension, choice and improved quality of education<sup>2</sup>
- Increase ICT understanding and skills of the entire population, especially to ensure that skills are developed to match future economic needs.

## **2.5 Improving health service delivery**

- Provision of broadband-enhanced health services to all communities through remote diagnostics, enhanced professional assistance to field health care providers, coordinated patient databases and access by people and professionals to better medical information online.

## **2.6 Enhancing Global Integration and International Relations**

- Connect PNG businesses and communities with the world
- Enable easy and affordable access to markets and counterparties overseas, reducing the cost of doing business
- Increase trade opportunities with overseas countries

## **2.7 Improvement in the efficiency of key sectors of the economy, and especially for primary resources, agriculture and fisheries**

- Enable advisory services to be more effective in reaching farmers particularly in terms of interactivity
- Enable guidance to be more effective primary production and higher yields
- Extend resources to be available to all producers in the primary sector of the economy

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<sup>2</sup> The substantial progress being made by the Department of Education in establishing initial school broadband connections and the operation of trials to determine the most effective and cost efficient means of providing for e-education modes of education service delivery is noted and applauded.

### 3. National Broadband Policy Principles

The objectives set out in this policy seek to ensure maximum benefit to PNG as a whole, supplementing other efforts to promote the national welfare, and supporting other government policies. The achievement of the objectives will be guided by a set of clear policy principles. The following principles will guide the National Broadband Policy in PNG:

- **Market driven:** to the maximum extent broadband infrastructure provision and service delivery will be through the operation of market forces, whilst recognising the critical role of government, a welcoming regulatory environment and in facilitating the provision of backbone capacity and the roll out of services with the assistance of the universal service scheme when it is established to areas in which broadband may not be commercially viable in the short to medium term.
- **Community involvement and ownership:** Broadband should benefit all communities in PNG whether they are academic, professional (including school based), urban, rural or local communities. Broadband initiatives will give high priority to community ‘ownership’ of facilities and community responsibility for the delivery of services on a viable basis.
- **Universal access:** The policy reflects the principle that broadband services shall be accessible to all PNG people and communities. Access is a function of availability, affordability and capacity to use. All of these aspects will be addressed in programs designed by the Government to ensure that universal access is achieved. In particular, as already noted, the Government will address broadband access for communities that might not otherwise be served through the operation of market forces. The universal service scheme, when established, will seek to extend access to broadband on a practical and prioritised basis. There will be emphasis on the development of community-specific content in accessible languages.
- **Affordability:** Broadband access services at entry levels shall be affordable for all people in PNG. This principle may take some time to be reflected in terms of individual service subscription levels, and therefore community-level access will be a high priority in the interim.
- **Leadership:** This Policy seeks to encourage leadership in broadband adoption and usage at all levels of PNG’s economy and society, and especially by the private sector. The Government also has a clear leadership role in transforming its own processes and public sector services showcasing the opportunities available through broadband. The Government’s role in terms of lead applications should inspire business and industry to develop applications to more effectively undertake their transactions with the public and with each other.
- **Government intervention:** Government intervention should not be a constant feature of the information economy, but will be needed when markets fail, or where non-Government actions are ineffective and likely to remain so, and when

there is a need for national example and leadership on key initiatives and other matters associated with broadband. The positive role and image of the government as a lead developer of applications cannot be overstated.

## **4. Short to Medium Term Goals for National Broadband Policy**

The achievement of the objectives set out in this policy will only be possible if specific goals are developed and met.

This policy seeks to achieve the following goals within the five year period to 2017:

**4.1 To have in place a competitive structure for the provision of broadband in PNG** – the Government will examine ways to remove any legal or regulatory barriers that may be an impediment to competition. Action plans to implement this policy will ensure that the market for broadband services operates competitively and will attract and sustain on-going investment, entry, and continued growth of broadband services, and of other services enabled by broadband, in PNG. The immediate source of competitive access is in the mobile sub-sector, but this will need to be matched in terms of fixed infrastructure access, including backhaul.

**4.2 To support the provision of broadband services to communities with an active interest in acquiring early broadband access** – the Government will dismantle the barriers that are making it difficult for communities who have either a business or education need to have access to broadband services. This provision will be implemented in the most cost effective manner, consistent with the continued provision of the service on a commercially sustainable basis. When the universal service scheme is operational the priority given to the establishment of community broadband facilities in locations where it may not be commercially viable, at least initially, will be considered. The initial emphasis will be on larger communities to ensure that the value of limited resources is felt as widely and as quickly as possible.

#### **4.3 To achieve broadband service availability of 100% in urban areas and of 70% of rural areas of PNG during the next five years**

– This is a geographical coverage or availability target and will be exceeded by the actual population coverage target. By the end of the Plan period (2018), 90% of the people of PNG shall have the ability to access broadband services at entry levels or better. However this goal will need to be converted into a series of prioritised steps with initial focus on larger towns and communities. This priority is suggested by the potential for greater numbers of people in more densely populated areas to be served at lower unit cost at the earliest time.

#### **4.4 To ensure that Broadband Services become and remain affordable for all people in PNG**

– an entry level broadband service shall be available to all with access at an affordable price. NICTA, in conjunction with the Department and other relevant agencies, licensed service providers and stakeholders, will define both the initial entry level service characteristics and an affordable price. A service download speed of 512 kbps shall be considered to be the initial entry level or basic service, pending further consideration by the parties referred to above. In order to make broadband affordable and desirable to middle and low income people in PNG, it will be necessary to establish policy settings that reduce cost, encourage high early demand (and gain scale economies) and ensure early development of applications of widespread appeal and utility, especially where local content is involved.

#### **4.5 To encourage and facilitate the development of PNG local content**

– support for local content will be through supporting local content developers, including contracting out to local private sector content developers where possible and encouraging mass usage of local content applications through Government leadership in usage. Local content initiatives include:

- Adaptation of foreign content for better and more convenient use by PNG users;
- Development of new content specifically targeted to PNG users, such as agricultural information and applications and cultural themes; and
- Use of languages other than English, where appropriate, to express content in accessible and useful ways.

#### **4.6 To support all academic institutions to have access to**

**Broadband**–100% of all primary and secondary schools in urban areas and 80% of all primary and secondary schools in rural areas to have broadband access to the internet during the next five years.<sup>3</sup>

#### **4.7 Government to lead the broadband evolution by delivering its services online over broadband**

– A significant programme of eGovernment transactions that can be performed online and enhanced by broadband shall be developed and progressively implemented during the course of the next five years. All licence applications, tax and other payment transactions, notifications and other functions will be encouraged in online form with incentives where possible for online rather than paper-based or in-person transactions.

Lead Government applications – additional to the above, Government shall develop a range of lead applications for delivery of new, enhanced or extended services online using broadband in Health, Education and primary production specifically:

- (a) All hospitals shall be connected to broadband for remote diagnostic and supervisory support and for other e-Health applications;
- (b) All field medical centres in communities with broadband availability shall be similarly connected;
- (c) All primary teachers shall receive training in broadband applications and use of broadband-enhanced educational resources in the classroom;
- (d) All secondary and selected tertiary curricula shall be deliverable using multimedia online capabilities to augment the syllabus in schools without specifically qualified teachers and to ensure that more and richer syllabus choices are open to all students in PNG attending schools in areas of broadband availability; and
- (e) Lead applications in agriculture shall be developed for PNG conditions to assist in efficient production, greater yields, marketing and logistics associated with these industries.

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<sup>3</sup> As at February 2012, 34 of 204 Government and private secondary schools, and 4 of the 3332 Government and private primary schools have broadband or internet access

## 5. Roles and Responsibilities for this Policy and related Strategic Action Plan

### 5.1. General coordination

NICTA has the general responsibility for the coordination of Policy implementation and for the monitoring, review, revision and reporting on a regular basis as required for effective outcomes. This responsibility will be discharged in coordination with the Department.

### 5.2. Broadband Coordination arrangements

The National Broadband Policy has been considered by the Government to be an important whole-of-government initiative. It is being coordinated by NICTA in conjunction with the Department of Communication and IT but it is the responsibility of all Departments and agencies to contribute to the Policy and to ensure that the economic sectors and social segments that they especially serve enjoy the maximum benefit possible from broadband. In short this is not a matter that can be left to agencies and organisations in one Ministerial portfolio. Coordination arrangements will be established to oversee the Policy and Plan implementation. The National Broadband Committee will report to the Minister for Communication and IT. It is important that the Committee report to a high level in Government to show the importance that the Government attaches to broadband as a tool of national economic and social development, and as a clear signal of the Government's own on-going commitment.

The **National Broadband Committee** has the following members:

- The CEO of NICTA (Chair)
- Members representing each Department or agency referred to in the Strategic Action Plan (details in Appendix 2 of this document)
- The Permanent Secretary of the Department of Communication and IT
- Such number of members representing the telecommunications service providers and the ICT industry in PNG as may be determined and appointed by the Minister for Communication and IT from time to time
- Such other members on an ex officio basis as determined by the Committee Chair and approved by the Minister from time to time.

The role of the National Broadband Committee is to ensure that the National Broadband Policy and the Strategic Action Plan remain current and reflect changing strategic emphases and priorities and to ensure, at a higher level, that there is accountability on the part of the Departments, Agencies and other major stakeholders involved for the actions entrusted to them.

NICTA shall be responsible for preparing regular reports on at least a quarterly basis, initially, on the implementation, monitoring, review and revision of the Policy and the related Strategic Action Plan for the Government. NICTA shall be responsible for overall implementation, monitoring and review of the Policy and related Plan, working through the Committees as appropriate.



## Appendix 1: Statistical Base

The latest available measures for the sub-sector overall are set out in Table 1 below, together with the trend on each measure for the past five years. Table 2 sets out other relevant information on ICT-readiness in PNG.

**Table 1: ICT and Broadband Measures for PNG**

|  | 2006    | 2007    | 2008    | 2009   | 2010      | 2011      |
|--|---------|---------|---------|--------|-----------|-----------|
| PSTN - Fixed telephone lines including fixed wireless access   | 61,500  | 60,000  | 66,846  | 91,125 | 121,172   | 130,000   |
| Fixed telephone per 100 inhabitants                            | 0.98    | 0.94    | 1.02    | 1.36   | 1.77      | 1.85      |
| Fixed internet subscriptions                                   | n/av    | n/av    | n/av    | n/av   | n/av      | n/av      |
| Fixed internet subscriptions per 100 inhabitants               | n/a     | n/a     | n/a     | n/a    | n/a       | n/a       |
| Fixed broadband subscriptions                                  | 0       | 0       | 2,987   | 4,453  | 6,100     | 7,500     |
| Fixed broadband subscriptions per 100 inhabitants              | 0       | 0       | 0.05    | 0.07   | 0.09      | 0.11      |
| Mobile cellular subscriptions                                  | 100,000 | 300,000 | 874,000 | n/av   | 1,417,546 | 1,909,078 |
| Mobile cellular subscriptions per 100 inhabitants              | 1.60    | 4.69    | 13.35   | 21.15  | 27.84     | 34.22     |
| Percentage of individuals using the internet in last 12 months | 1.75    | 1.79    | 1.15    | 1.61   | 1.28      | 2.00      |

Source: ITU – statistics collected from member countries.

Note: Figures are at 31 December for each year.

**Table 2: Fixed internet access services in PNG**

| Measure                           | 2010  | 2011  | Unit                    |
|-----------------------------------|-------|-------|-------------------------|
| International internet bandwidth  | 3,167 | 5,703 | Bit/s per internet user |
| Households with computer          | 2.8   | 3.0   | % of households         |
| Households with internet          | 2.2   | 2.5   | % of households         |
| Individuals using the internet    | 1.3   | 2.0   | % of individuals        |
| Gross enrolment ratio (secondary) | 22.7  | 22.7  | % enrolled              |
| Gross enrolment ratio (tertiary)  | 15.4  | 15.4  | % enrolled              |
| Adult literacy rate               | 60.1  | 60.1  | % literate              |

Source– ITU - statistics collected from member countries

## Appendix 2: National Broadband Strategic Action Plan

The Strategic Action Plan (“the Plan”) below is part of the National Broadband Policy and covers the five year period up to the end of 2018.

The opportunities and requirements associated with broadband for most of that period are emerging and changing rapidly. A lot can change in the broadband and ICT world over the next five years. The Government’s approach will therefore be flexible, in order to exploit new developments that cannot be identified with certainty at this time.

However, some action items which are apparent and can be achieved within definite timeframes, have target dates assigned to them. Many of these action items fall in the earlier years covered by the Plan.

The implementation focus is targeted on key achievements and on projects that will have lead-application and inspirational value in PNG leading to more economic and social broadband applications. In the broadband eco-system, initial applications and successes encourage and generate more applications and successes, and success becomes cumulative, feeding on itself.

The Government has taken a deliberate view that it is better to seek to focus on a smaller number of very important projects and ensure that they are completed effectively and on time than to have a long list of desirable outcomes in the Plan that may well exceed the management and financial capabilities of the parties involved, or the resources that can be deployed. On the other hand, the list of items included in the Plan is not necessarily exhaustive and may well be augmented by additional items, particularly in later years.

For the purposes of this discussion Supplementary Notes have been included at Appendix 3 in which the issues around the scope and implementation of each Plan item are addressed in a more discursive manner.

| Item | Goal                                   | Description and target   | Responsible                           | Completion     |
|------|--|--|---------------------------------------|----------------|
| 1    | Competition, Regulation and Investment | 1.1 Examine ways in which availability and affordability of broadband can be enhanced through the removal of any unnecessary regulatory constraints and financial imposts, together with re-design of schemes to encourage investment in broadband delivery. Undertake this in the course of reviewing the Act generally | NICTA, in conjunction with Department | By end of 2013 |

|   |                               |   |   |  |
|---|-------------------------------|---|---|--|
|   |                               | <b>1.2</b> Provide certainty about the definition of broadband by establishing a minimum (entry) level download speed of 512 kbps for regulatory purposes, and review regularly.  | <b>NICTA</b> , in conjunction with industry stakeholders  | By end of Q3, 2013   |
|   |                               | <b>1.3</b> Establish rules for the review of spectrum utilisation and for the cancellation of spectrum resources that are not being used.   | <b>NICTA</b> , in conjunction with Department, and in consultation with industry stakeholders   | Feasibility study by end of 2013, and if feasible, implementation by 2015 with substantial notice periods for spectrum allocation cancellation |
|   |                               | <b>1.4</b> Examine and analyse ways of introducing a more market-based approach to the allocation and sharing of spectrum, including auction systems and, in time, secondary trading of spectrum.   | <b>NICTA</b> in conjunction with the Department and all stakeholders                            | Feasibility study by end of 2013, and if feasible, implementation by 2015  |
|   |                               | <b>1.5</b> Review and determine the optimum approach to the management of Government funded broadband transmission and backhaul capacity, such as gas pipeline related transmission systems, and include in the consideration the possible establishment of a separate Data Co. | <b>Department and Minister</b> after taking advice from NICTA and other interested stakeholders | By Q3 013  |
|   |                               | <b>1.6</b> Development and passage of comprehensive e-Commerce Law to protect consumer and trader rights in online transactions and to provide a comprehensive and certain framework for development  | <b>NICTA</b> in conjunction with the Department and all stakeholders                            | Development of draft legislation for consultation by Q1 2014   |
|   |                               | <b>1.7</b> Commence discussions with neighbouring Governments to facilitate access to cheaper international bandwidth   | <b>Department</b> , in conjunction with Foreign and Trade Departments and industry stakeholders | During 2013  |
| 2 | Community access to broadband | <b>2.1</b> Establish a Universal Service Scheme in PNG which includes:<br>(a) individual and community broadband access objectives and targets;<br>(b) the development of broadband content in subject-areas that are unlikely to be addressed commercially; and                | <b>NICTA</b> in conjunction with Department and all stakeholders                                | Commence major review of the Scheme in 2013 and complete review by Q2 2014. Implement the scheme by the  |

|   |               |  |  |  |
|---|---------------|--|--|--|
|   |               | (b) service deployment and capacity building and adult education programmes for ICT and broadband.   |  | end of Q2 2015.  |
|   |               | <b>2.2</b> Review the minimum entry level download capacity for broadband for the purposes of the Plan and of regulation generally – noting that the February 2013 entry level is a download capacity of 512 kbps  | <b>NICTA</b> in conjunction with Department and all stakeholders   | Progressively, with annual reviews of this Policy and Plan   |
|   |               | <b>2.3</b> Establish adult community training programmes on how to use and benefit from broadband and internet access and deliver community-based training services and related certification scheme. (Examine also whether these programmes are able to be funded through the Universal Service Fund, and whether they should extend to both urban and rural areas of PNG.) | <b>NICTA</b> in conjunction with Department and all relevant Ministries including those responsible for labour, training and education                               | On-going programme to commence by the end of Q3, 2013  |
| 3 | Availability  | <b>3.1</b> Achieve availability of broadband at the minimum entry level or higher speeds to 30% of the PNG population by the end of 2014 and to 90% of the population by the end of 2018. [Note that this will include establishing an effective UAS as well as extension of current operator initiatives.]  | <b>NICTA</b> in conjunction with Department and all stakeholders   | Achieve the 80% geographic target by the end of 2018 at latest. (Note that this refers to coverage by all technologies.) |
|   |               | <b>3.2</b> Encourage fixed and mobile service providers to include a range of price packages for broadband in their service offerings, and review the appropriateness and adequacy of the range on a regular basis.  | <b>NICTA</b> in conjunction with Department and all stakeholders   | Initial review by Q1 2014 and monitoring thereafter  |
| 4 | Affordability | <b>4.1</b> Undertake a review of the taxation and other incentives associated with broadband in PNG and determine a whole-of-Government approach to encouraging private investment in broadband infrastructure and service development, especially for extending services to second rank cities and towns, and potential direct subsidies to users.                          | <b>NICTA</b> in conjunction with the Department and other departments responsible for economic development, taxation and finance, and with all industry stakeholders | By end of 2014   |
|   |               | <b>4.2</b> An entry level broadband service option to be available to all at an affordable price, as a mandated offering in the broadband service schedules of all licensed service  | <b>NICTA</b> in conjunction with Department and  | By end of Q3 2013  |

|   |                             |  |   |   |
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|   |                             | providers. Once the regulated price of the mandated broadband service offering has been established for each type of service provider, remove price controls on other retail broadband offerings.  | all stakeholders  |   |
|   |                             | <b>4.3</b> Develop Guidelines for Local Authorities to facilitate a uniform and low-impact local government planning and operating regime insofar as it affects ICT and broadband deployment, penetration and cost. The arrangements are also intended to improve physical security of telecommunications towers and other assets. | <b>NICTA</b> in conjunction with Department and all stakeholders, including departments responsible for rural affairs and development | By end of Q2, 2014  |
|   |                             | <b>4.4</b> Develop a Code of Conduct for Tower and Infrastructure Sharing, including model terms for Sharing Agreements for all licensed operators.  | <b>NICTA</b>  | By end of Q2, 2014  |
| 5 | Broadband penetration       | <b>5.1</b> Within the overall population availability target of 90% by 2018, determine the penetration milestone target that shall apply within each region and province for each year of the Plan   | <b>NICTA</b> , in consultation with industry stakeholders   | Determine intermediate targets by end of 2013   |
|   |                             | <b>5.2</b> Develop demand-side facilitators of broadband take-up and usage through development of applications and content, including the development of content in languages other than English for specific purposes.  | <b>NICTA</b> in conjunction with relevant departments   | Commence as soon as possible in 2013, and through USF when that has been established                          |
|   |                             | <b>5.3</b> Examine and implement incentives for broadband service take-up by individuals and households and incentives for service providers to set and achieve challenging but relevant targets for penetration, including collaborating with service providers to provide free WiFi spots in public areas.                       | <b>NICTA</b> , in consultation with industry stakeholders   | By end of 2013  |
| 6 | School access and education | <b>6.1</b> All primary and secondary schools to have broadband access, in urban areas, and in those rural areas that have broadband service availability [Note that 34 out of 2017 secondary schools, and 4 out of 3,332 primary schools had broadband or internet access as at February 2013.]                                    | <b>Department of Education</b>  | (1) Development of a programme by Q3, 2013. (2) Progressive delivery thereafter to 95% completion by end 2018 |
|   |                             | <b>6.3</b> Primary and secondary school  | <b>Department of</b>  | Progressive   |

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|   |  | syllabuses to be formatted for complete delivery, as necessary, via broadband means, in association with 6.1 above   | <b>Education</b>   | completion to end 2014   |
|   |  | <b>6.3</b> Primary and secondary school teachers to be trained in the effective operation of relevant broadband applications and delivery of approved syllabuses by accessing broadband services.  | <b>Department of Education</b> with teacher training institutions        | (1) Development of a programme by Q3, 2013. (2) Progressive delivery thereafter to 95% completion by end 2018                    |
| 7 | e-Government                               | <b>7.1</b> Coordinated examination within each Department of relevant transaction processes and development of a prioritised eGovernment programme for implementation, with initial applications being determined on the basis of their likelihood to encourage broadband service take-up. | <b>NICTA</b> , in conjunction with all departments and agencies          | Completion of review by the end of Q4, 2013  |
|   | Licenses, approvals and other transactions | <b>7.2</b> Within the overall programme in 7.1 establish Government portals for the application for the grant and renewal of licences and other approvals given by Government, and for the electronic conduct of other transactions, such as the lodgement of returns.                     | <b>NICTA</b> , in conjunction with all departments and agencies          | Completion by end of 2014  |
| 8 | Lead applications in Government programs   | Additional to 7.1 and 7.2 above, Government to develop a range of lead applications for delivery of new, enhanced or extended services online using broadband in Health, Education, Finance, Agriculture and Tourism, specifically as set out below.                                       | <b>NICTA</b> , in conjunction with all relevant departments and agencies | Develop and commence monitoring a detailed set of milestones by Q3 2013 for progressive implementation to completion in Q4, 2018 |
|   |  | <b>8.1</b> 100% of hospitals to be connected to broadband for remote diagnostic and supervisory support.   | <b>Department of Health</b>  | 60% by end 2016, and 100% by end 2018  |
|   |  | <b>8.2</b> Local and community medical centres in all areas with service availability to be connected to broadband   | <b>Department of Health</b>  | 60% by end 2016, and 100% by end 2018  |
|   |  | <b>8.3</b> Develop comprehensive patient data bases to enable all PNG people to be provided with the best possible care and attention wherever they present with health  | <b>Department of Health</b>  | Development of detailed strategy by Q2 2014 and progressive  |

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|    |   | issues in PNG – possibly with specific patient groups with chronic conditions involving high-cost treatment to be covered initially.  |   | implementation from that date.  |
|    |   | <b>8.4</b> Develop detailed plans for lead applications in agriculture and fishing related to improving land use and crop yields, improved fishing yields, and produce marketing.   | <b>Department of Agriculture and Fisheries</b>  | End 2013  |
|    |   | <b>8.5</b> Additional to 8.4 above, establish a comprehensive information portal to provide farmers and other primary producers with information to assist in best practices for planting, cultivation and harvesting.  | <b>Department of Agriculture and Fisheries</b>  | By Q2 2014  |
|    |   | <b>8.6</b> Develop online payment system in relation to payment to be made to Government for fines, permits, taxes, passports and other services.   | <b>Department of Finance</b>  | Complete feasibility study and planning by Q2 2014, with implementation thereafter. |
|    |   | <b>8.7</b> Further refine the e-commerce and e-business policies and environment to facilitate greater take-up and improved scale efficiencies. This may take the form of establishing coordination mechanisms to exploit the potential for online commerce on a sector-specific basis. | <b>NICTA and Department,</b> in conjunction with other relevant departments and agencies. | Complete feasibility study and planning by Q2 2014, with implementation thereafter. |
|    |   | <b>8.8</b> Additional to 5.2, establish a detailed plan for facilitation and prioritised support for local content and local applications development, including all levels in the content value chain.   | <b>NICTA,</b> in conjunction with content stakeholders                                    | Complete a detailed plan by the end of 2013 and implement thereafter.               |
| 9  | Recognition of ICT Champions                  | <b>9.1</b> Design and implement a scheme for the identification and public recognition of outstanding leadership and entrepreneurship in the application of broadband to advance PNG's society and/or economy.  | <b>NICTA,</b> in conjunction with other relevant departments and stakeholders             | By end of Q4, 2013, and implement as an annual event                                |
| 10 | Data collection to measure broadband progress | <b>10.1</b> Review existing arrangements, and, if necessary, design and implement enhanced data collection and reporting arrangements to enable baseline and progress to be understood and for achievement of the Policy and Plan goals to be measured and communicated.                | <b>NICTA,</b> in conjunction with other relevant stakeholders                             | Design by end of Q3, 2013, for quarterly collection and analysis thereafter.        |

## Appendix 3: Supplementary Notes to the Plan

### Purpose

The purpose of these Supplementary Notes is to provide further explanatory comment on the Strategic Action Plan, including on issues relating to timing and to implementation. It is not intended that they form part of the final Policy or Plan.

### Whole-of-Government Perspective

Broadband is an enabling service that has immediate and longer term potential to transform economic processes and relationships and to enhance social inclusion and interaction. The potential impact and benefits of broadband therefore are deep and pervasive and cut right across the traditional organisation of government functions into specialised ministries, departments and agencies. For this reason the Policy and the Plan have been drafted with a high level of coordination in contemplation of ensuring that a whole-of-government perspective is adopted in planning for broadband availability and applications. To extract maximum national advantage from broadband it is important for all departments and agencies to work in a consistent and coordinated manner. NICTA and the Department of Communication and IT may have a key coordinating role, but broadband is everybody's concern and everybody's opportunity.

### ActionPlan Item 1 – Competition, Regulation and Investment

The major thrust of the actions outlined in Item 1 is to create an environment that will provide certainty and encourage investment into broadband platform development and extension and into broadband service innovation and deployment. These factors will ensure that broadband is delivered to as many people as possible as early and as cheaply as possible.

**Item 1.1** is broadly based and is aimed particularly at taking full opportunity to consider whether unnecessary regulatory burdens can be removed in the course of the current review of the operation of the NICT Act. Although the Act is relatively new there may be opportunities to relieve the regulatory burden on the industry in ways that enable it to deliver services, including broadband services, at lower cost.

NICTA has already commenced action to ensure that excessively high interconnection charges are reduced. These charges otherwise act to price inter-carrier calls above what they should be and therefore to increase price and reduce demand.

Legacy regulation and categories will become a major and increasing retardant to broadband deployment as time goes on. Consistent with this is the need for a degree of regulatory forbearance to enable competitive broadband service providers to develop innovative price-packages and service definitions.



A long-term perspective on consumer welfare is required, and retail price minimisation is certainly not consistent with the consumer interest in having profitable and viable broadband service providers competing robustly with each other in the medium and longer term.

**Item 1.2:** The draft Plan notes that there is a regulatory and administrative need to define a minimum entry level broadband service (at the lowest acceptable download speed – currently set at 512 kbps), possibly at a regulated price. This approach will assist in the overall affordability and penetration of broadband. Universal experience suggests that most users will seek to quickly move on and up from entry level services.

The minimum entry level should not be confused with aspirational levels of very high speed broadband. The development of applications and related demand will determine how the market reacts to the provision of higher capacity services at any given time. Certain applications will require download speeds well in excess of 512 kbit/s, and if the demand is at commercial levels the market must be permitted to satisfy that demand with minimal regulatory impediment.

**Items 1.3 and 1.4** represent a set of actions to better manage the efficient allocation and utilisation of spectrum.

**Item 1.3** recognises that past practices of making allocations of spectrum available on an administrative basis is no longer sufficient and that needed spectrum capacity must be put into play in alternative ways. NICTA will need to consider a range of issues including objective assessments of spectrum utilisation efficiency, the possible introductions of “use it or lose it” principles, and the notice periods that will be necessary to avoid windfall compensation to current non-using spectrum licensees.

**Item 1.4** is related to Item 1.3. If the current arrangements are considered to be inappropriate for PNG’s future, they will need to be replaced with spectrum allocation arrangements that meet national interest and overall economic objectives. Efficiency considerations suggest that market-based approaches need to be considered for both initial allocation and for subsequent trading between spectrum users. There are many variants that have been implemented in other countries and these provide a starting list for study in PNG.

**Item 1.5:** The absence of high quality and reasonable cost transmission backhaul is a concern to the industry generally. Various stakeholders have commented about the potential problems if Government-funded backhaul (such as the fibre systems associated with the gas pipeline) are put into the hands of Telikom or any entity that is managed by the IBPC. Telikom representatives also expressed concern about the effect of IBPC ownership on timely and adequate capital programmes and investments. There is an issue that will need to be considered and resolved about how government-funded assets can be best managed, and whether the current arrangements that the Government has in place – such as IBPC oversight – have been adequate or not. The notion of a separate Data Co, adopted by the previous government, also need to be reconsidered, especially if it is to become another part of the IBPC’s portfolio.

**Item 1.6** reflects the concerns of industry stakeholders who have recognised the weakness of the legislative framework for e-Commerce. E-Commerce will develop when the framework that protects consumer and trader rights is spelled out with considerable certainty. The

Department of Commerce needs to take a lead in this area, but design of appropriate legislation involves a much wider group of commercial and consumer stakeholders.

**Item 1.7** recognises that action is needed at Government-to-Government levels with neighbouring governments to arrange PNG access to international bandwidth capacity and to reduce the cost to PNG service providers and customers. Broadband service penetration is sensitive to cost and quality and both of these are risk factors in PNG. This item is only one means of reducing broadband access prices. Mass take-up will generate some scale effects but these could result in quality and performance issues if international access is subject to price-related capacity constraints. The development of greater local content and local exchange mechanisms will, in the longer term, be a factor (albeit small in the short to medium term) in reducing the need for international capacity that would otherwise have occurred.

## **Action Plan Item 2 – Community access to broadband**

There are many issues that impact on broadband availability and affordability. Many are dealt with later in the Plan. The issues in Item 2 are those that affect community access, particularly in rural and other under-served areas.

**Item 2.1** raises the issue of how to design and implement an effective Universal Service Scheme (USS) in PNG and the scope of such a scheme. Should it, for example, cover broadband training support and skills development for the wider community? In the course of discussions with stakeholders it became apparent that there were differences of view on these matters and the extent of funding support through a USF. The Government, through NICTA, has now commenced a World Bank-funded project directed towards bringing a Universal Access Scheme into operation. It is important that that project's outcomes be incorporated into the National Broadband Policy and associated Plan. However it is impossible to be too specific at this stage because the project is only just underway and it will be some time before outcomes emerge and recommendations are adopted for implementation.

**Item 2.2** is essentially a repeat of Item 1.2, but this has been done to reflect that the issue has implications for community adoption as well as for regulatory efficacy. Item 2.2 recognises that, although many applications require broadband download speeds of 20 Mbps and more, there is a minimum entry level that must be defined by policy makers and regulators from time to time. At the least, a minimum entry level is needed -

- to act as a threshold level for assistance from Government or through USF schemes
- to determine what can be counted as broadband

The Plan needs to encourage the provision of broadband services of the capacity required for particular applications, but at the same time ensure mass availability of at least a minimum defined service level.

As noted in the draft Plan the minimum entry level broadband service will need to be reviewed on a regular basis as technology and needs change. That might be best undertaken in the contemplated annual review of Plan progress. It is envisaged that the current entry level of 512 kbps download speed will in time increase. NICTA will need to consider not only internal PNG-factors, but world trends and international competitiveness issues as well.

**Item 2.3** deals with the important issue of community readiness to embrace broadband. New generations are more computer-literate and technology-literate than older generations, by and large. However, if PNG wants communities to significantly embrace broadband in the next five years to the same extent as individuals have adopted mobile technology over the past decade, some additional efforts will need to be made. One important approach is via adult learning and community training programmes. It needs to be confirmed how these might be organised and funded, and in that regard an authoritative decision on whether money from a USF can be used (and if so how and how much) is needed. However, USF funding need not and should not be the only means of delivering adult education. A wider program supported by a range of government programs and private commercial initiatives needs to be examined.

### **Action Plan Item 3 - Availability**

**Item 3.1** reiterates a fundamental Policy and Plan requirement about the availability to be achieved at two key times over the period of the Plan.

The entire Policy and Plan is the means of achieving these milestones, and it is not appropriate at this stage to establish more detailed targets in Item 3.1 than are already noted there. However, more detailed time-based milestones will need to be developed and monitored by NICTA and the coordinating committee as the Plan is progressively implemented.

The specific milestones in Item 3.1 have been cited to test stakeholder views on what is achievable. Targets in this area should be stretch-targets, not safe and readily achieved outcomes based on continuing with current organic growth patterns. Please note that availability means service coverage. It is a different matter from service take-up. Service take-up or adoption targets are referred to later under Item 5 – Broadband penetration.

**Item 3.2** addresses a key issue with fixed and mobile service operators and ensuring that they realise their collective potential to contribute to mass broadband service take-up. This issue is connected to the regulation challenge referred to under Item 1.1. With retail price regulation the tendency has been for operators to offer the same service at the regulated cap and rely on branding to differentiate their offerings. This sameness has been the source of many consumer complaints. Innovation in price-service packages and the service menu generally is what markets appear to want in many countries and the operators should be encouraged to respond.

### **Action Plan Item 4 –Affordability**

Mass adoption of broadband is a function of availability, affordability and usability. The first and third of these have influenced earlier items in the draft Plan. The third requires a concerted approach by Government and industry across the board. Mass service take-up in itself will improve affordability as service providers achieve scale efficiencies and are able to pass them on to customers in the form of lower prices. However there are many other facets to the issue of affordability.

**Item 4.1** addresses the need to re-examine the impact of the total taxation system on broadband. It is important that finance ministries take a longer term view about charges and

taxes on input items required to assemble broadband services, and on taxing direct outputs. Broadband is a transforming service enabling greater economic growth and development. A longer term view on taxation means that a larger economy will be available to be taxed in the medium term with better tax yields than short term imposts that impact on affordability and take-up.

**Item 4.2** has been mentioned before. To ensure affordability without intrusive and distorting regulation it is appropriate for a mandated entry level service option to be made available at a regulated price which is generally considered to be affordable. This service will be basic broadband in every sense. Most customers might be expected to move on to higher speed services relatively quickly to gain greater amenity from access and to access applications that require greater capacity.

**Item 4.3** is a response to comments from service providers and others in the industry that a uniform and more supportive approach from local authorities would assist in planning deployment, reducing costs, and supporting improved affordability. With this in mind the preparation and publication of guidelines that will assist local authorities and provide for optimum uniformity where it can be achieved would seem to be a useful step. The opportunity might also be taken to enlist local authorities as champions of broadband rollout and usage, in their local areas. Specific matters that might be included in Guideline material are:

- details of successful pilot applications in other parts of the country (or even other countries) relating to health, education or other Government e-service delivery
- assisting broadband rollout by simplifying and reducing planning and local permit requirements
- local programs to encourage the community to regard broadband as an important community resource – leading to approaches to security, usage and amenity issues

There is a specific concern about the way in which the physical security of telecommunications towers and other assets is at risk when land disputes arise. Local authorities have a role to play in diverting negative energies and encouraging parties to negotiate rather than to deny service to whole communities through sabotage. NICTA needs to consider with local authorities what might be done in this regard.

**Item 4.4** seeks to facilitate better the sharing of infrastructure amongst network operators and broadband service providers. PNG is seeking investment in broadband and in telecommunications infrastructure generally. However the purpose of new investment should be for new platforms and transmission systems where none exist, not the duplication of towers and other infrastructure and facilities that can be better utilised. The Code for Tower and Infrastructure Sharing is therefore an overdue aid to getting better returns from investments and thereby to reduce the costs passed on to customers. It is important for cost reduction and improved affordability.

## **Action Plan Item 5 – Broadband penetration**

Penetration refers to actual take-up of services, and not to availability (coverage) or affordability. Penetration is a function of these factors. Penetration is also a function of

demand-side factors. The clearer the uses that broadband can serve, the more likely that penetration will be greater and sooner.

**Item 5.1** refers to the development of penetration targets by region and province for each year of the Plan. Reliable forecasts are important across the whole gamut of broadband planning, and these will need to be regularly revised in the light of achievements in service penetration. Government agencies and private service providers will need to plan their own official and commercial activities with likely broadband audiences in mind.

The targets have been developed to gauge stakeholder opinion and responses. They are open to change. However they should relate to availability targets and should be stretch-targets, rather than straight line projections from the current low level of take-up.

**Item 5.2** addresses the need to better understand how to create incentives for broadband service take-up at individual level. Affordability (already addressed in the Plan) is only one dimension of this challenge. Community leadership and peer pressure and encouragement may be important considerations. Because of the likelihood that there might be regional and cultural variations in broadband adoption and usage patterns, there is much that NICTA and industry stakeholders need to study. Language is an important matter in a multi-lingual country such as PNG and high speed internet service, facilitated by broadband, is the right medium to sustain diversity of language offerings for major and popular content. This will be an on-going programme. Clearly there will be a heavy emphasis on English language content, but some content might be usefully developed in other languages as well. This will be a content-specific decision.

**Item 5.3** is about creating individual and household incentives for broadband service. One important factor, albeit amongst many factors, is the availability of cheap or free access. In many countries local authorities, airport and transport hubs, restaurant chains and other public locations have free WiFi hotspots in public areas. These arrangements promote usage and adoption, and have been used successfully in other countries.

## **Action Plan Item 6 – School access and education**

The long term success of broadband as an enabler of fundamental and continuing economic and social transformation needs to be secured in the education systems. The sub-items in this item relate to the broadband access by schools (item 6.1); syllabus to be deliverable by broadband to both enrich educational offerings at any location and to ensure minimum delivery arrangements in regional remote locations (item 6.2); and teacher training in ICT generally and in using it effectively for delivery of education services (item 6.3).

The initial work that has been undertaken by the Department of Education to date, especially in terms of remote schools and trials elsewhere, should be recognised and its continuation encouraged.

## **Action Plan Item 7 – e-Government (or transactions with Government)**

The leadership role of Government in implementing applications related to delivery of government services to the public and for better administration and coordination within government is vitally important. The result will be transparency and efficiency of government administration and also a direct incentive for business and individuals to use broadband. Initial applications by government need to be those with greatest return (reduced cost, easier and better administration, and so on) and also those with potential to encourage others. NICTA, in conjunction with all other government stakeholders, needs to ensure that there is a prioritised program of initial applications in e-Government and that it is well-publicised. The specific responsibility for each application and project remains with the responsible department or agency, however.

### **Action Plan Item 8 – Lead applications in Government programs**

Specific lead applications are noted under this item. Again, the responsibilities of the relevant department or agency are not affected by inclusion of the initiative in the Plan.

### **Action Plan Item 9 – Recognition of ICT Champions**

The importance of success stories in broadband application development cannot be underestimated. Establishing a Champions program, based on success of individuals, firms or Government units (or, better, all three) is recommended. NICTA and the Department are in best position to coordinate this recognition program.

### **Action Plan Item 10 – Data Collection**

Effective Plan management, monitoring, review and revision rely on the availability of data to measure progress against specific targets. The Plan has to be evidence-based and achievement has to be assessed in the same way. Much data exists in separate areas of Government administration. Sharing this data will be an important first step in implementing Item 10.1.