IPART
New South Wales

Independent Pricing and Regulatory Tribunal

Pricing NSW Government mobile radio services

Developing a pricing methodology and recommending prices from 1 July 2011

Other Industries — Issues Paper
March 2011

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Invitation for submissions

IPART invites written comment on this document and encourages all interested parties to provide submissions addressing the matters discussed.

Submissions are due by 8 April 2011.

We would prefer to receive them by email <mobileradio@ipart.nsw.gov.au>.

You can also send comments by fax to (02) 9290 2061, or by mail to:

Review of NSW Government radio services
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Our normal practice is to make submissions publicly available on our website <www.ipart.nsw.gov.au>. If you wish to view copies of submissions but do not have access to the website, you can make alternative arrangements by telephoning one of the staff members listed on the previous page.

We may choose not to publish a submission—for example, if it contains confidential or commercially sensitive information. If your submission contains information that you do not wish to be publicly disclosed, please indicate this clearly at the time of making the submission. IPART will then make every effort to protect that information, but it could be subject to appeal under freedom of information legislation.

If you would like further information on making a submission, IPART's submission policy is available on our website.

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1 Introduction

The NSW Government has asked us to review the pricing of mobile radio services and develop a methodology for setting the prices that government and non-government agencies are charged for using its shared mobile radio network infrastructure, known as the Government Radio Network. It has also asked us to use this methodology to recommend prices for the period from 2011/12.

The purpose of this paper is to explain how we intend to conduct this review, discuss the key issues we will consider, and seek written submissions from stakeholders on these issues.

1.1 What radio services are within the scope of the review, and which agencies will it affect?

Our review focuses on the Government Radio Network (GRN), which is a trunked or shared radio network that currently provides services to 34 agencies. These services provide a vital means of communication both within and between these agencies during emergencies, and are also used in their day-to-day operations.

The GRN's current users include 5 of the 6 agencies responsible for law enforcement, public safety and emergency services in NSW and the ACT:

- Ambulance Service of NSW
- Fire and Rescue NSW
- NSW Rural Fire Service
- NSW State Emergency Service, and
- ACT Emergency Services.

They also include some essential services providers as well as other government and non-government agencies.

However, the outcomes of our review will affect more parties than these current users. As a result of NSW Government decisions made following a strategic review by the NSW Department of Premier and Cabinet (DPC), NSW's mobile radio networks will undergo significant structural and operational changes over the next few years, including the consolidation of many of the existing conventional (or agency-specific) radio networks and their integration into the GRN thereby

providing state-wide mobile radio services.[1] The first of these networks, or parts thereof, planned to be incorporated into the GRN is the NSW Police Force's network. Other networks will be consolidated and integrated in stages.

In addition, the outcomes of this review will affect the insurance industry and local governments in NSW, which are required to make statutory contributions to the cost of providing fire and emergency services in this state.

1.2 What has IPART been asked to do?

The terms of reference for this review (as attached at Appendix A) direct us to:

1. Develop a pricing methodology based on full cost recovery principles for application to users of shared mobile radio network infrastructure. The methodology would take into account the current and future operating and capital costs to maintain shared networks. It would be both simple and equitable to implement.
2. In developing the methodology, take into consideration applicable risk factors including:
   a) the future cost impacts on in-scope NSW mobile radio users from reforms by the Commonwealth Government (Australian Communications and Media Authority) for the pricing and availability of radio spectrum
   b) the future cost impacts on government and non-government user agencies based on their different requirements for shared mobile radio network usage and coverage levels
   c) the application of competitive neutrality principles for public trading agencies that are users of the shared mobile radio network infrastructure
   d) a phased introduction of the proposed state-wide service.
3. Provide advice on the cost impact of the proposed methodology on eligible users and government agencies from 2011-12. This will enable the Government to assess the implications of the new methodology for user agencies.
4. Examine the cost impact and implications of the proposed methodology on statutory contributions for mobile radio for
   a) the insurance industry and
   b) local government, noting that IPART's Local Government Cost Index already includes categories related to mobile radio such as operating leases, emergency service levies, and telecommunications services.
5. Based on the proposed methodology, recommend prices to commence on 1 July 2011.

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1 The Government's decisions are summarised in the Premier's Memorandum 2010-16 (attached at Appendix B). The DPC, *Strategic Review of NSW Government Mobile Radio Services*, Draft Report, October 2010 (hereafter DPC, *Strategic Review*) has not yet been published.

1.3 How do we propose to approach this task?

We propose to use an analytical approach that is similar to the approach we use for other pricing reviews, although those reviews are often conducted over a longer pricing period than the period that is feasible in this review. The analytical approach involves the following key steps:

- decide on the most suitable method for establishing the total efficient costs incurred in providing mobile radio services via the GRN (and which the terms of reference indicate need to be recovered through the prices charged for these services)
- decide how to allocate these costs among the GRN's users (or categories of user) for the purpose of setting prices
- decide on the appropriate price structure and other issues related to setting prices that will recover the total efficient costs
- assess the future impacts on GRN users and other stakeholders of the prices likely to result from this methodology, and make any adjustments needed to enhance the method's equity and simplicity, and
- use the methodology to initially calculate prices for 2011/12 and recommend these prices to the Minister.

1.4 How and when can stakeholders provide input to the review?

In addition to undertaking our own research and analysis, we will consult with key stakeholders – including the managers of the GRN, the NSW Government Telecommunications Authority, users of the GRN and other interested parties. In particular, we invite all interested parties to make written submissions to the review by 8 April 2011. We will also convene a roundtable discussion in early May to provide stakeholders with another opportunity to present their views on key issues.

We will consider all matters raised in submissions and at the roundtable discussion before we make our final decisions on the proposed methodology and recommended prices. We will provide our final report to the Minister for Commerce in time for the implementation of the recommended prices from 1 July 2011.

Table 1.1 sets out the indicative timetable for the review. Details on how to make a submission can be found at the front of this paper.

Table 1.1 Indicative timetable for the review

Key tasks	Due
Post terms of reference and indicative timetable on our website	17 January
Release issues paper and seek submissions from stakeholders	3 March
Receive submissions	8 April
Hold roundtable discussion with stakeholders in IPART offices, Sydney	2-5pm, 6 May
Provide final report to Minister for Commerce	Late June

1.5 List of issues on which we seek comment

The following chapters identify and discuss the issues on which we particularly seek comments. Stakeholders may address all or some of these issues in their submissions, and may also raise any other issues they consider relevant to this review. For convenience, a full list of the issues on which we seek comment is set out below along with the page at which we request such comment.

1.6 What does the rest of this paper cover?

To assist stakeholders in making submissions to the review, the following chapters provide some important contextual information and discuss the key issues we will consider at each step of our proposed process:

- Chapter 2 provides some background on mobile radio networks in NSW and outlines the planned structural and organisation changes to these networks and their implications for this review.
- Chapter 3 explains the current structure and usage of the networks that are relevant to IPART's review, as well as their coverage and pricing arrangements.
- Chapters 4 to 7 discuss each of the key steps in our proposed analytical approach for this review – including establishing the efficient costs of providing the GRN's services, allocating these costs among its users, setting prices and assessing the impact of these prices on users. They also identify the key issues we need to resolve, and some of the options for their resolution.
- Chapter 8 discusses 2 other issues the terms of reference require us to take account of in conducting the review – changes to the pricing or availability of radio spectrum allocated by the Commonwealth Government, and the need to comply with competitive neutrality principles when setting prices for users that are public trading agencies.

Our aim is to develop a pricing methodology that will assist in setting fully cost-reflective prices in the future and that will be sufficiently adaptable so as to require minimal adjustments to the methodology as the NSW Government Telecommunications Authority's shared radio network evolves over time.

2 NSW mobile radio networks and planned reforms to these networks

Mobile radio networks provide important services to many government and non-government agencies – especially those responsible for law enforcement, public safety and emergency response and (to a lesser extent) those who provide essential energy, water and transport services. Unlike most mobile phone services, mobile radio networks can readily facilitate person-to-group and group-to-group communication, and broadcast urgent messages to many listeners within and across agencies. Their exclusive nature also provides greater certainty of access to the users in times of high demand when commercial networks may be overwhelmed.

The NSW Government and its agencies own multiple mobile radio networks. This reflects the way in which the use of mobile radio services and the technology involved in providing these services have developed over the last century. In the coming years, many of these networks will require major capital investment to renew and replace assets.[2] Given the potential size and scope of this investment, the Government plans to rationalise these networks in order to contain costs and improve service delivery.

To help stakeholders understand the context for IPART's review of pricing for mobile radio services, the sections below provide some background information on the development of radio networks in NSW, the Government's plans for reforming these networks over the coming years, and the implications of these plans for this review.

2.1 Development of mobile radio networks in NSW

Australian government and other agencies have used conventional (or non-shared) mobile radio networks since the 1920s. Each of these networks uses a dedicated band (or bands) of specific frequencies, and allocates dedicated frequency pairs or 'channels' to specific users. The conventional networks have been usually owned by the agency that uses them, and have been operated to meet the specific needs of that agency.

2 Many had their last major upgrade almost 20 years ago in order to operate in the UHF band, as discussed below.

However, as the dedicated frequencies are idle whenever the users are not talking on their channel, conventional networks can be wasteful of spectrum. This was not an issue when there was more spectrum than users. By the 1980s, the increasing demand from phone, mobile radio and TV broadcasting meant that portions of the VHF bands most commonly used for mobile radio communication were effectively full. To resolve this problem, the Commonwealth spectrum regulator actively encouraged conventional radio networks to shift from the VHF bands to the (then) largely vacant 403-520 megahertz (MHz) part of the UHF band.

At the same time, technological developments provided another solution to the growing demand for limited spectrum: trunked (or shared) networks. Trunked mobile radio networks use a pool of available frequencies, and allocate these frequencies to users based on their demand for access to the network. This type of network has several advantages over multiple conventional networks, including that:

- It allows more efficient use of the available spectrum. For example, the number of terminals on a trunked network can exceed by several multiples the number of frequencies required to facilitate communications at any one time on the network.[3]
- It not only allows the users to communicate within their own agency, but also allows them to communicate with other agencies, some of which may be interstate. This feature may be particularly important when a wide-scale emergency arises.

In terms of cost, one trunked network is more expensive to build and operate than a conventional network, or even several conventional networks. However, because of its economies of scale, a trunked network's costs are less than the combined costs of many conventional networks when it operates in areas with a high user density.

Given these advantages, the NSW Government (like the Victorian Government) decided to respond to the growing demand for frequency by developing a new mobile radio network using the newly available trunking technology deployed in the UHF band. This trunked network – the NSW Government Radio Network or GRN – became operational in 1993.

[3] For example, the GRN has around 4,000 talk groups but only a fraction of them will want to access one of its 550 frequencies at the same time (barring a very widespread emergency). Terminals can refer to handheld or portable radios, radios mounted inside a vehicle (usually referred to as in-vehicle) or radio mounted on a desk (usually referred to as desktops).

However, the Government continued to fund the operation of its agencies' conventional networks during the 1990s and 2000s, as the GRN did not cover the whole state. In addition, in part because it was established after many of the conventional networks, it was not able to meet the specific requirements of all potential users.[4]

2.2 Planned changes to NSW mobile radio networks

At present the GRN is completing its conversion to the P25 standard, which is the program to upgrade the GRN from analogue to open-standard digital. The conversion is expected to be completed by the end of March 2011.

In the coming years, many of NSW's mobile radio networks will require major capital investment to renew and replace assets. Given the potential size and scope of this investment, the Government asked the Department of Premier and Cabinet to conduct a strategic review of the networks.[5] This review considered, among other things, how the Government should best operate, replace and rationalise its mobile radio networks to contain costs and improve service delivery.

The Department of Premier and Cabinet recommended significant structural and operational changes to these networks, which were largely adopted by the Government in late 2010. The most important of these changes (at least in the context of IPART's review) is a new role for the NSW Government Telecommunications Authority (Telco Authority) within DSTA.

The Telco Authority has been made responsible to improve the levels of service delivery for government radio users through more integrated, cost-efficient delivery of mobile radio infrastructure and services. To achieve this goal, it is empowered to:

1. Assume ownership over time (through the agreed vesting of assets) of all NSW Government owned mobile radio communications networks and associated budget allocations. The vesting is not to occur where the 'releasing agency' can demonstrate that such vesting is inappropriate.
2. Consolidate, to the extent possible, conventional networks and integrate them into the GRN so as to provide improved cost efficiency and better service levels across all the (reconfigured) networks.

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4 For example, the GRN was originally designed for in-vehicle radios but the NSW Police Force requires signal penetration into buildings. This means that sites need to be relatively close to each other. However the GRN's 30 sites in the Sydney metropolitan area compares unfavourably to the 110 in the NSWPF network. Therefore DSTA and the NSW Police Force are researching how to improve the GRN to close the gap in the 2 networks' densities.

5 The bulk of the DPC, *Strategic Review* was undertaken in early 2009 using then-available data which is now somewhat out-of-date. We have cited data from the review only where more recent data have not been available.

The Telco Authority is also required to audit existing mobile radio infrastructure, develop sector-wide policies on spectrum acquisition and allocation and manage spectrum-related negotiations with the Commonwealth Government. In addition, it is required to reduce the duplication of existing and new assets, consolidate maintenance costs and generate volume discounts in purchasing.

In terms of timing, the Telco Authority will proceed in stages, in the following priority order:

1. Consolidate the conventional network of the NSW Police Force (NSWPF) within the GRN metropolitan footprint.
2. Consolidate conventional networks outside the GRN footprint (focusing first on emergency and essential services).
3. Integrate the consolidated conventional networks and the consolidated GRN/NSWPF network to create a single state-wide mobile radio service.[6]

2.3 Implications for IPART's review

The planned changes to NSW mobile radio networks have implications for this review. The terms of reference require us to develop a pricing methodology that will apply to the shared network only. At present, this is the current GRN plus as much of the NSWPF as is integrated into it during 2011/12.

However, as the conventional networks are consolidated within the GRN, the shared network will expand. Thus in principle, the methodology needs to be applicable both to the 2011/12 GRN and to the expanded versions of this network that evolve as this consolidation occurs over the short and medium term.

Of course, the size and value of the GRN's asset base will be uncertain and growing over the short and medium term, due to this consolidation and the significant capital investment expected over this time. The actual size of this asset base will depend on:

- The outcomes of the Telco Authority's audit of existing mobile radio infrastructure assets, which is expected to result in the absorption, reconfiguration or retiring of some of the assets currently in the GRN and the conventional networks.
- The Telco Authority's review of proposed radio network-related capital expenditure programs of NSW government agencies. We understand that the forward indicative program has in the order of around $330m over the next 4 years and $900m[7] over the next 10 years. The actual size and shape of the capex program is likely to be affected by other factors such as technological developments and procurement method (eg, the possible use of a public private partnership).

6 For more information, see NSW Premier's Memorandum No 2010-16 attached at Appendix B.
7 DPC, *Strategic Review*.

Further, like all state and territory government radio services, the GRN will be subject to other forces during the next decade. Some of those forces at the national level are:

- the aim of the Commonwealth spectrum regulator, the Australian Communications and Media Authority (ACMA), to streamline the radio spectrum and provide a dedicated allocation in the 400MHz band to state and territory governments for law enforcement, public safety and emergency purposes
- the National Framework to Improve Government Radio Communications Interoperability as endorsed by COAG,[8] and
- the rollout of the National Broadband Network.

The GRN will also be subject to technological forces. These include the increasing technical capabilities of cellular phone networks and related services, such as voice-over-internet-protocol, PABX and pagers, which may allow mobile phone networks to displace some of the functions in some of the agencies currently performed by radio.

8 Commonwealth of Australia, *National Framework to Improve Government Radiocommunications Interoperability*, 2009. In late 2009, the Council of Australian Governments endorsed the National Coordinating Committee for Government Radiocommunications' framework. The purpose of the framework is to provide the guiding principles and key areas of work for jurisdictions to enable transition towards radiocommunications interoperability.

3 Current structure of NSW mobile radio networks

As Chapter 2 discussed, the terms of reference for this review require us to develop a methodology for pricing services provided by the Government's shared mobile radio network – the GRN. However, plans to develop a state-wide mobile radio service that incorporates the GRN and integrated/consolidated conventional networks mean that in developing this methodology we also need to be aware of the conventional networks and their users.

Table 3.1 provides an overview of the current structure and use of the mobile radio networks in NSW. The sections that follow describe the key characteristics of these networks, especially the GRN.

Table 3.1 Selected characteristics of NSW Government mobile radio networks

Network name and description	Service category	Users
Government Radio Network (GRN) – effectively a single, integrated shared network	Mobile voice	Currently used by 34 agencies including 5 of the 6 major law enforcement, public safety and emergency services agencies
Conventional networks – multiple non-shared or single agency networks	Mobile voice	Used by 57 agencies
Mobile Data Radio Network (MRDN) – a single non-shared network	Mobile data	Used by the Ambulance Service of NSW
Industrial control systems, known as supervisory control and data acquisition (SCADA) systems – multiple non-shared networks	Fixed data	Used by essential service providers to monitor and control such things as height of dam water and integrity of power lines

Source: Adapted from various DSTA internal sources.

3.1 The Government Radio Network (GRN)

Currently, the GRN is owned by the state of NSW through DSTA. Its staff are employed by the Government Chief Information Office, and the network's operations are managed under contract.

The Telco Authority will shortly be responsible to own and operate the GRN and (among other things) consolidate it and many of the conventional networks into an integrated shared network. Its staff are drawn from DSTA and various mobile radio-using agencies. The operational aspects of the network will continue to be managed under contract.

The sections below describe the characteristics of the GRN, including its current user base, traffic volume, coverage, revenue and pricing.

3.1.1 GRN's user base and traffic volume

In the case of a shared network like the GRN, 'using' the network has 2 major dimensions – access and traffic volume:

- Multiple agencies have *access* to the network at all times. Their level of access may be approximated either by the number of its registered terminals, or by the number of registered terminals that are activated for immediate use.
- Some of these 'users' do not necessarily generate a lot of traffic on the network. The volume of traffic will vary from agency to agency and with time of day and time of year. Overall *traffic volume* may be approximated by the number of minutes an agency 'talks' on the network each year.

The distinction between access and traffic volume may have implications for pricing of network services. For example, in pricing the services provided by water and electricity utilities, we use both fixed and variable charges. The fixed charge represents the price of access to the utility's network, and the variable charge applies to the volume of water or electricity consumed. Where possible, the variable component reflects the marginal cost of providing the service, and the fixed component the residual amount needed to generate total revenue required.

Who currently has access to the GRN?

The GRN is the largest single radio network in NSW with around 28,000 registered mobile radios on it. The numbers are as indicative only because they are expected to shrink considerably by 1 April 2011 when the GRN completes its transformation from an analogue to a digital network. The majority of the terminals are used by 5 of the 6 agencies in law enforcement, public safety and emergency services (Table 3.2).

Table 3.2 Largest users of the GRN

Agency	Registered number of GRN terminals
NSW Rural Fire Service (RFS)	8,317
Fire and Rescue NSW (FRNSW)	5,007
NSW State Emergency Service (SES)	4,191
Ambulance Service of NSW (Ambulance Service)	3,240
ACT Emergency Services (ACTES)	1,701
Total of largest users	**22,456**

Source: Private correspondence from DSTA, 2 February 2011.

The 5 agencies, together with the NSW Police Force, may usefully be referred to as the 'Big 6' in this paper, as they are not only the largest users of mobile radio networks in NSW but also require access to one or more of these networks to function effectively.

In addition to the public safety and emergency services agencies, 29 other agencies are registered to use the GRN. Six are essential services providers, including Sydney Water and Ausgrid (formerly EnergyAustralia). The remainder includes:

- 13 NSW Government agencies and departments
- 6 other government agencies (4 Federal Government, the Sutherland Shire Council and the Central Tablelands County Council) and
- 4 non-government organisations (CareFlight, Chevra Hatzolah, Child Flight and Surf Life Saving Australia).

Table 3.3 shows the number of terminals in each category, while Appendix C provides a complete list of users. Of the 34 users with access to the GRN, 16 operate only on it. The other 18 also operate on a conventional network.[9]

Table 3.3 GRN terminal numbers by user category

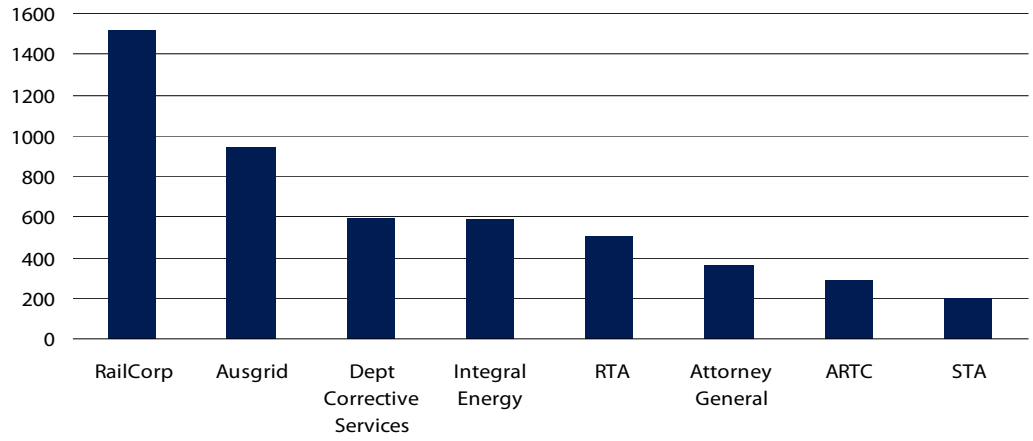
User category	Number of terminals
Public safety and emergency services	22,456
Essential service providers	3,324
Other NSW Government agencies	2,097
Other government agencies	1039
Non-government organisations	34
Total	**28,950**

Source: Private correspondence from DSTA (2 February 2011).

9 DPC, *Strategic Review*.

Agencies other than the law enforcement, public safety and emergency services agencies that have 200 or more terminals registered on the GRN are shown in Figure 3.1. Only RailCorp is of similar size to the smallest of these agencies (the ACTES). Together the other 8 agencies have 4,993 registered terminals or 17% of the total.

Figure 3.1 Other agencies with 200 or more registered GRN terminals



Source: Private correspondence from DSTA, 23 February 2011.

How much traffic do these users generate?

Now consider the volume of traffic generated by the GRN's users. Traffic volumes depend on a range of factors, such as:

- the number of talkgroups and the number of people in each one
- the number of sites being employed to service the talkgroups and their location
- the number of calls being made by the talkgroups and how long each lasts.

The Telco Authority monitors its sites and models the levels of congestion on the network. If congestion persists at any of its sites, capacity is expanded to meet the growth in traffic volumes.

The number of active users on the network at one time is not a guide to the capacity of the network nor to its congested spots, if any, because talkgroups can be of varying size, location and utilisation.

3.1.2 GRN's coverage

The GRN currently covers one-third of NSW and much of the ACT. Both its area of coverage and the density of that coverage have increased over time. It has a central controlling hub known as the Network Operations Control Centre (NOCC).

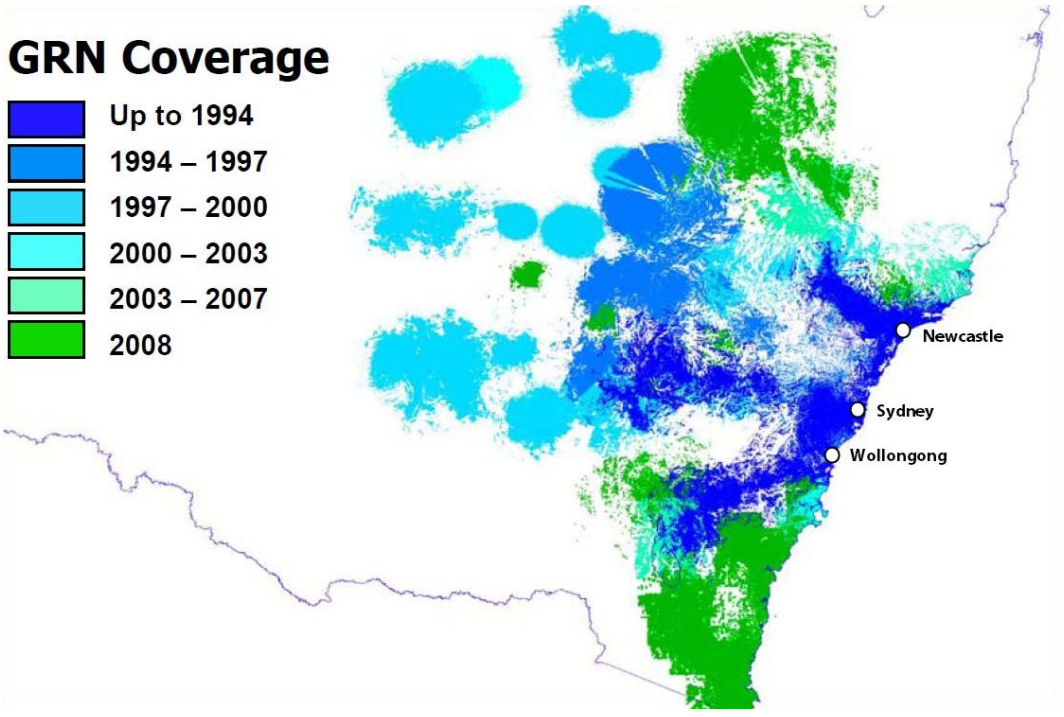
The GRN is attractive to its users because of its coverage and service. It also has some features that are not possible or readily available on conventional networks, such as 'authentication' which is the ability to prevent a lost or stolen radio from accessing the network.

However, its attractiveness for some users and potential users is diminished because:

- its coverage has been inadequate in some areas within the GRN footprint, including in-building black spots and in newly established regional growth areas[10]
- it does not cover around two-thirds of the state.

On its inception in 1993, the GRN covered the Sydney Basin and the 4 main highways out of the basin (the Pacific, New England, Great Western and Hume highways). This initial coverage reflected either areas of highest population density or the locations that were most likely to require mobile radio services. Since 1993, the GRN has expanded in several major stages, primarily in line with areas that have the highest actual or expected population densities (see Figure 3.2). The white spaces on the map are serviced by one or more conventional networks. The GRN expects to extend into the North Coast during its next expansion phase.

Figure 3.2 The footprint of the GRN in NSW and the ACT



Data source: DPC, *Strategic Review*. We have added the 3 locations for convenience.

10 DPC, *Strategic Review*. Reach and density on the South Coast improved markedly in 2009/10.

The GRN comprises around 160 sites. Each site contains one or more towers[11] for antennae and microwave dishes, and other equipment and resources. The sites are linked together via terrestrial cable or microwave dish and the whole network is managed from the NOCC or the backup Disaster Recovery NOCC. The site land and most of the towers are rented rather than owned by the Telco Authority.

3.1.3 GRN revenue

In 2009/10, the GRN received its revenue from 2 major sources, its users and revenues derived from rents paid on the 17 site towers that it maintains (Table 3.4).

The bulk of the revenue is derived from user charges. These are levied on all users based on the number of terminals they have activated on the network. The exception is the ACTES, which owns the radio sites located in the ACT. The ACTES uses NSW infrastructure to support radiocommunications across these sites by connecting to the NOCC. The ACTES pays a negotiated annual usage charge under a contractual arrangement that reflects its customised need. The annual charge is based on the proportion of total sites used by it and applied to the total cost of operating the GRN.

Table 3.4 GRN revenue in 2009/10

Source	Revenue ($m/year)
User charges:	
▼ All users except ACTES (based on number of activated terminals)	6.922
▼ ACTES (based on number of sites used)	0.259
Site revenues	0.796
Total	**7.977**

Source: Private correspondence from DSTA, 28 February 2011. ACTES is ACT Emergency Services.

3.1.4 GRN pricing

GRN's prices are based on the number of 'active' terminals registered on the network. Active terminals are those registered radios that are 'turned on' and so ready for immediate use. Some users chose to set a significant proportion of their registered terminals to 'inactive' during periods of low demand, a behaviour that has implications for the revenue the GRN generated.

The prices also differed according to type of agency (Table 3.5).

11 In some cases, the 'tower' may be the rooftop of a commercial building or a water tank.

Table 3.5 GRN prices in 2008/09

Agency type	Price per activated terminal ($/month)
Volunteer agencies	28.05
On-Budget agencies, Federal agencies and NGOs	36.45
Local councils	40.50
State-owned and Federal commercial corporations	62.85

Source: DPC, *Strategic Review*. Changes since the review have reduced the number of agencies to 34.

The prices are low relative to the cost of providing the services. For example, in 2009/10 the revenue the GRN generated from user charges and site revenues was equal to around 36% of its operating (or recurrent) expenditures only.

Implications for users' funding

Users that are on-Budget NSW Government agencies and departments receive funding from the State budget. For the non-NSW Government users, the impact of the prices on each user depends on the flexibility of their sources of funding and the share of mobile radio costs in their total costs.

For FRNSW, the RFS and the SES, their costs are largely funded from statutory contributions from the insurance industry and local councils. Contributions from the insurance industry currently fund 73.7% of these 3 agencies' estimated costs, while those from local councils fund 11.7% with the balance is paid by the NSW Government.

Implications for this review

The terms of reference require us to examine how our pricing methodology, when applied to the GRN, will affect the future charges paid by users of the GRN and the 'funders' of those users.

The cost impact on the insurers and local councils will depend on the size of the rise in GRN charges incurred by the agencies funded by these contributions (Fire and Rescue, the Rural Fire Service and the SES), and the size of these agencies' GRN charges relative to their total costs.

3.2 The conventional networks

Some 57 agencies own and operate conventional mobile radio networks in NSW. These agencies include all of the 5 public safety and emergency services agencies that use the GRN and the NSW Police Force. In most cases, the coverage of the Big 6's conventional networks overlaps with that of the GRN. Further, a significant number of communications sites in NSW contain 2 or more networks' transceiving/linking equipment, thereby duplicating equipment at these sites.

The sections below describe the characteristics of the conventional networks in more detail, including their users, coverage and pricing.

3.2.1 Conventional networks' users

The 5 largest conventional networks in NSW are operated and used by the RFS, the Police Force, Rail Corp, FRNSW and the STA. These agencies and the number of terminals in their networks are shown in Table 3.6.

Table 3.6 The largest conventional networks by number of terminals

Agency	Terminals
Rural Fire Service	16,320
NSW Police Force	14,908
RailCorp	3,160
Fire and Rescue NSW	2,712
State Transit Authority	2,250
Total	**39,350**

Source: Private correspondence from DSTA.

Agencies have continued to operate their conventional networks because they cover areas not reached by the GRN, and also because:

- some areas within the GRN's broad footprint are considered to be inadequately covered
- some agencies have expressed concerns about the GRN's reliability and security relative to their own networks.[12]

3.2.2 Conventional networks' coverage

It is not helpful to show the coverage of the many (overlapping) networks on a map. The important point is that several of the law enforcement, public safety and emergency management networks together cover almost all of NSW, and the networks of the essential service providers are often tailored to their specific needs.

One of the major tasks of the Telco Authority will be to assess the extent to which conventional networks can be consolidated and then integrated into the GRN.

12 DPC, *Strategic Review*.

3.2.3 Conventional networks' pricing

As most conventional network users own and operate their own network, they do not bring to account an explicit cost to use them. Many of the NSW government agencies and departments receive funding for their network directly from the State budget. Once approved, they can use these funds to maintain or extend their network as planned.

Others, including the RFS, FRNSW and the SES, receive most of their funding from statutory contributions from the insurance industry and local governments. They can also use these funds to maintain or extend their network as planned, once they have been approved and allocated.

This suggests there would be a 'price advantage' to these agencies if they continued to own and operate their conventional networks rather than have these networks consolidated into the GRN. Agencies may perceive the GRN to be offering a more expensive service than using their own networks. At present, we understand the funding arrangements once the ownership of an agency's conventional network is vested in the Telco Authority and consolidated with the GRN have not yet been finalised.

3.3 The Mobile Data Radio Network

The Mobile Data Radio Network (MDRN) is a mobile data system used by the Ambulance Service that allows a 2-way flow of data between a control centre and enabled vehicles. The network has been operating in Sydney and on the Central Coast since 2004 and has since expanded to Newcastle and Wollongong and other areas.

Around 690 ambulances had the capacity for data messaging in 2008. The benefits of the MDRN are that it:

- improves record management
- is an efficient method of using limited spectrum
- reduces the amount of report writing required of ambulance drivers and attendants, and
- enables management of the Ambulance Service to use vehicles more effectively.[13]

13 DPC, *Strategic Review*.

The terms of reference require us to review the pricing of shared mobile radio services and suggest that the MDRN is within the scope of this review. However, the MDRN is used exclusively by the Ambulance Service of NSW so that it is not a shared service.[14]

[14] An implication for the present review is that, to the extent that the charge for using the MDRN is not fully cost-reflective, the shortfall must be funded by the Telco Authority. Our recommended prices will only reflect the cost of providing the services of the GRN and will not include any shortfall in the MDRN.

4 Establishing the total efficient cost of providing the GRN's services

As Chapter 1 discussed, the first step in our proposed analytical approach for this review is to decide on a method for establishing the total efficient costs likely to be incurred in providing the GRN's services over the price determination period. This method must take account of the total costs – including operating and capital costs – because the terms of reference require us to develop a pricing methodology based on full cost recovery principles.

In addition, this method should consider the efficiency of total costs and exclude those considered to be inefficiently incurred. This is consistent with the Government's aims in reforming its mobile radio networks, which include driving greater cost efficiency. It is also consistent with good regulatory practice (and our usual practice), which is to set regulated prices to recover only the efficient costs of the agency concerned, on the ground that buyers of its services ought not to pay for costs that are incurred due to its inefficiency.

At this stage, we consider that the only feasible method that meets these criteria is what is widely known as 'the building block approach'. The approach is already widely used by IPART and other Australian regulators in setting prices in network industries. It takes full account of both the operating and the capital costs incurred in providing the relevant services. It also ensures that the costs are measured and monitored in a rigorous and transparent way, which promotes economic efficiency.

The sections below provide an overview of the building block approach, and discuss how we might apply it to recommend prices for the period 1 July 2011 to 30 June 2012.

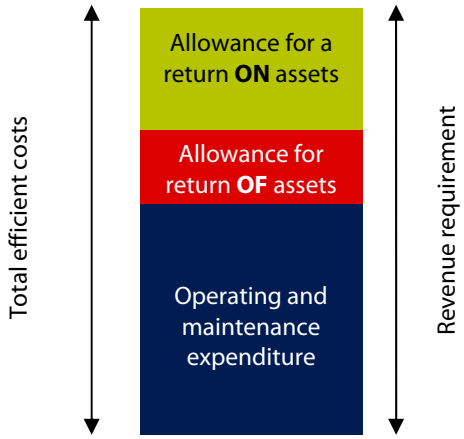
4.1 Overview of the building block approach

When the building block approach is applied to a range of network industries (including energy, water and telecommunications), it is usually applied for periods of 3 to 5 years, depending on the particular review in question. The key outcome is a multi-year 'price path' that provides some certainty for the utility that is being regulated.

The approach 'builds up' the total efficient costs of providing the services concerned – or the total revenue required to recover these efficient costs – over each year of a determination period. It does this by calculating 3 cost 'blocks':

- **The forecast efficient operating expenditure**, which includes operating, maintenance and administration costs.
- **An allowance for a return of assets (or regulatory depreciation**), which takes account of the capital invested in the business and enables these investments to be recovered over the life of the assets.
- **An allowance for a return on assets,** which takes account of the opportunity cost of capital invested in the business, and enables the owners/shareholders to earn a reasonable return of return on this investment (Figure 4.1).

Figure 4.1 Building block approach



4.1.1 Forecast operating costs

This cost block includes the efficient operating expenses the business expects to incur each year over the length of the determination period. To determine these expenses, we seek information from the business on its actual operating expenditure in the years immediately before the determination period (past expenditure), and its forecast operating expenditure during this period (forecast expenditure).

We typically engage an expert consultant to review this information, assess the efficiency of the past and forecast expenditure and recommend the potential to reduce the forecast expenditure by making efficiency gains. We sometimes obtain a benchmarking review to assess the expenditure and performance of a network against similar networks.

We consider the business' information, the consultant's findings and recommendations and any stakeholder comments before then deciding on the forecast efficient operating costs in each year of the determination period.

4.1.2 Allowances for regulatory depreciation and a return on assets

Both these allowances relate to the capital costs of the business:

- The allowance for regulatory depreciation[15] recognises that the business' infrastructure and other assets wear out or become obsolete over time. It enables the business to set aside annual reserves from which it can maintain its capital base.
- The allowance for a return on assets compensates owners/shareholders for committing capital to the business and bearing any risks associated with the business. It also ensures that capital is allocated to its most valuable uses and provides a return that may induce funding future expansion of infrastructure.

To determine these allowances, we require the initial value of the regulatory asset base (RAB), which includes all infrastructure and other assets used in providing the services being priced. Where an initial value of the RAB has been established prior to a review, we typically take the following steps:

- assess the business' past and forecast capital expenditure to decide whether it was prudent and efficient
- recalculate the opening value for the RAB, by incorporating the past and forecast capital expenditure found to be prudent and efficient, and adjusting for inflation and other factors as necessary
- calculate the allowance for regulatory depreciation based on an appropriate depreciation method and the asset lives for the business' existing and new assets
- calculate the allowance for a return on assets by deciding on an appropriate rate of return for the business, and applying this to the appropriate asset base.

To assess the prudency and efficiency of past and forecast capital expenditure, we typically obtain information from the business on this expenditure, and engage an expert consultant to assess the information. This assessment usually includes the scope for deferring capital programs and any efficiency improvements that can be made by the business. We then consider the information, the consultant's findings and stakeholder comments to make our finding.

In calculating the allowance for depreciation we usually use a 'straight line' method that depreciates the assets in the RAB by an equal amount in each year of their economic life. We consider this method to be superior to alternatives in terms of its simplicity, consistency and transparency. It may be that radio assets would be better suited to a different depreciation profile.

[15] Regulatory depreciation differs from the financial depreciation which reflects the tax laws and so depreciates assets at rates that may only be loosely related to an asset's actual life. Regulatory depreciation is most often derived by dividing the efficient written down value of an asset by an estimate of its remaining asset life.

To decide on an appropriate rate of return for the business, we typically calculate the feasible range for the weighted average cost of capital (WACC) for businesses in its industry, and decide on the most appropriate point within this range. The WACC is the weighted average of the cost of debt and equity. A number of parameters must be specified in order to derive it.

Our standard approach for network businesses uses a range of values for a real pre-tax WACC based on several market-based parameters and several, assigned, non-market parameters. Details on the parameters are set out in Appendix D.

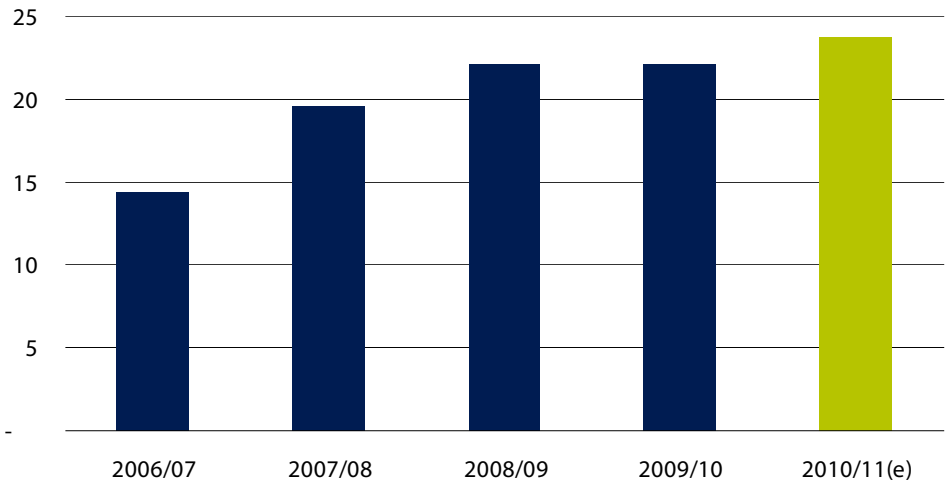
4.2 How we might apply the approach to prices for 2011/12

Our ability to apply the building block method in recommending GRN prices for 2011/12 will be limited by the available information. Importantly, there is a great deal of uncertainty about exactly how much and when spending on the GRN will occur over this year, as the expansion and consolidation process is just getting underway. Therefore, in what follows we outline what we consider to be the most appropriate, albeit interim, way to develop a pricing methodology at this stage and prices for 2011/12.

4.2.1 Determining the forecast efficient operating expenditure

To date, the Telco Authority has provided information on the GRN's past operating expenditures and its estimate for 2010/11 (Figure 4.2).

Figure 4.2 GRN operating expenditures ($m)



Note: e = estimated.
Source: Private correspondence and data from DSTA, February 2011..

Over the period since 2006/07, operating costs have risen by 65% as the GRN has expanded and the number of sites has increased. Consolidation of parts of the network meant that total operating costs were steady in 2009/10 but the estimated rise of 7.5% in 2010/11 reflects significant rises in electricity cost, repairs and maintenance and network link costs. Corporate overheads are also expected to rise as the process of structural expansion, consolidation and integration begins.

The breakdown by major categories of operating cost for 2009/10 is shown in Table 4.1. The first 2 items relate to the operation and maintenance of the network infrastructure, the costs for which are largely set under contract.

Table 4.1 GRN operating expenditure 2009/10

Operating Expense	$000
Network Management	8,295
Network Link Charges	7,279
Site Rental	2,335
Staff Salaries & Wages	1,697
Frequency Licenses Charges	529
Repairs and Maintenance	517
Other operating expenses	1,404
Total	**22,056**

Note: For subsequent years, a change in contracted operations manager will see Repairs & Maintenance costs rolled up into Network Management fees. 'Other' includes fees for services & office expenses, other miscellaneous network expenses, corporate & business support and electricity at sites.

Source: GRN unaudited financial accounts, private communication.

Expenditure in 2011/12 will depend on the extent to which conventional networks are consolidated and integrated into the GRN in that year. Operating expenditures are likely to rise as consolidations and integrations proceed.

Given the uncertainty about the accuracy of forecast expenditure, and the potential for it to increase significantly from 2012/13 and beyond, we consider it would not be cost-effective to conduct an expert review of the efficiency of the Authority's forecast of operating expenditure in 2011/12.

Therefore, for recommending prices for 2011/12 only we propose to use the Authority's forecast expenditure for that year as the best available information and then examine it for reasonableness. We will apply the NSW Government's 1% efficiency dividend target to the expenditure (unless it has already been applied or the expenditure is fixed under contract) to determine the forecast efficient operating costs.

4.2.2 Determining the allowances for depreciation and the return on assets

To determine these allowances, we would normally undertake a rigorous process to establish the initial opening value of the business' RAB. But for the purpose of recommending the GRN's prices for 2011/12 only, we consider that this would not be worthwhile, for 2 reasons.

First, the GRN is currently being upgraded from a proprietary Motorola SmartZone 4.1 analogue system to an open standard P25 digital system. Prior to approval, a business case for the P25 upgrade was made to Treasury that also included a procurement strategy. The insurance industry and local councils were also involved because RFS digital handsets had to be upgraded to ensure connectivity to the GRN. A major part of the RFS's costs are met by the insurance industry and local councils.

Second, the digital upgrade renders the analogue equipment obsolete. This affects the value of the GRN asset base to the extent that at 1 July 2011 it will mostly reflect the cost of the P25 digital upgrade which is currently estimated to be around $33m. Given the small size of this base relative to the size to which it will shortly grow, we consider it would not be cost-effective to undertake an efficiency review to set an initial value for the GRN RAB.

Instead, we propose to examine the Authority's estimate of the written down value of the GRN's assets to assess whether it is reasonable. The estimate is expected to be provided once the P25 upgrade has been completed in April.

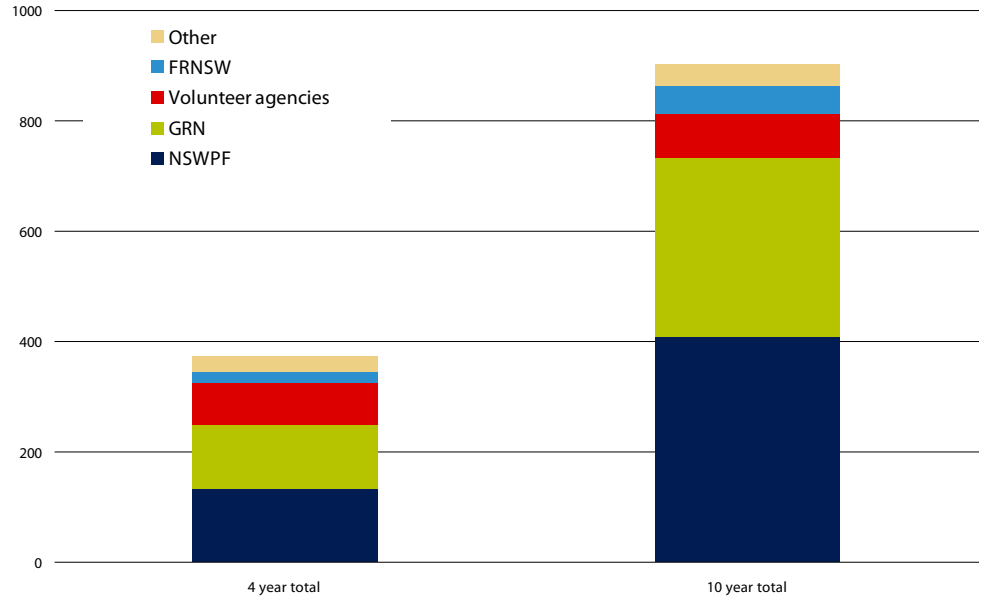
For the same reasons, we do not propose to undertake an expert review of the GRN's forecast capital expenditure. We propose to examine the Authority's forecast capital expenditure to ensure it is reasonable.

We stress again that this would be an interim approach only. For future reviews to recommend prices, when the size of the GRN's asset base has expanded, we would expect to undertake a detailed efficiency review of the asset base and GRN's operating and capital costs.

The size of the GRN asset base has the potential to expand significantly over the next few years.[16] This can be seen in Figure 4.3, which shows the capital expenditure that all the government mobile radio network owners proposed to do prior to the NSW Government's decision to consolidate and integrate them. The total capital expenditure is shown over the 4 years to 2012/13 and the 10 years to 2018/19.

[16] Before the Government's decisions to consolidate and integrate the radio networks, the potential existed for a 10-fold rise in capital spending based on the projection of the agencies. DPC, *Strategic Review*.

Figure 4.3 Proposed capital spending by all radio networks from 2009/10 ($m)



Note: 'Other' includes 8 other agencies and state-owned corporations.
Source: DPC, *Strategic Review*, October 2010.

To summarise, to determine the allowances for a return on assets and regulatory depreciation for 2011/12, we would estimate:

- the opening value of the RAB (as of 1 July 2011) based on an assessment of the Telco Authority's estimate of the written down value of the GRN's assets
- the allowance for regulatory depreciation by dividing the sum of the opening RAB and half the year's forecast capital expenditure by the average remaining life of the assets (in effect a 'straight line' depreciation method)[17]
- the allowance for a return on assets by deciding on the appropriate rate of return for the GRN based on the feasible range for the WACC, and multiply the appropriate value of the RAB by this rate.

A worked example of this approach to applying the building block method is provided in Box 4.1.

17 Half of the value of the annual capex is depreciated because we usually assume that capex is incurred evenly throughout the year so that its average level over the year is half its total value for the year.

Box 4.1 A worked example of the building block approach applied for one year

To illustrate the mechanics of calculating the revenue requirement from the building blocks, assume that:

- efficient opex is expected to be **$25m** in 2011/12
- the opening RAB is $30m
- efficient capex for 2011/12 is forecast to be $12m
- the average remaining asset life of the opening RAB is 5 years and that new capex has an average life of 10 years
- the WACC is 7%.

Depreciation for the year would be calculated as the depreciation on the opening RAB plus depreciation of half the capex expected for the year. Using straight line depreciation and the assumed remaining asset lives, regulatory depreciation is **$6.6m**, comprised of $6.0m on existing assets ($30/5) and $0.6m on new assets ($6m/10).

The return on capital is calculated by multiplying both the opening RAB and half of the capex for the year by the WACC. In this example it would be $36m multiplied by the WACC of 7%, giving us a return on capital of **$2.5m**.

Summing each cost component, the revenue requirement in 2011/12 would be **$34.1m**.

Our calculation of full cost-reflective prices would apply only to 2011/12. The building block approach, however, is based on efficient costs that are normally reviewed at regular intervals. Therefore, we intend to undertake this more detailed review at an appropriate time in the future.

IPART seeks comments on the following

1 Do the trends in GRN's operating and capital expenditures appear reasonable?

2 Is there another feasible method for establishing the GRN's total efficient costs other than the building block approach?

3 In determining the allowance for regulatory depreciation, is 'straight line' depreciation appropriate, or should we use another approach?

4 In determining the allowance for a return on assets, are there grounds for departing from our usual WACC approach and its standard parameter valuations?

5 Allocating the efficient costs among the GRN's users

The terms of reference require us to set a pricing methodology based on full cost recovery principles and which is both simple and equitable to implement. Therefore, once the total efficient costs of providing the GRN's services have been established, the next step in our proposed methodology is to decide whether all categories of user should pay the same price, or whether there should be distinctions between types of users.

The sections below discuss the issues involved, and some of the options for addressing them.

5.1 Allocating costs between categories of users

We consider that the users of the GRN do fall into different categories.

The first category of user relates the importance of the network to their operations, and whether or not alternative forms of communication can meet their requirements. As the terms of reference for our review recognise, the 6 "law enforcement, public safety and emergency service organisations … have the most critical operational need and requirements for mobile radio services."[18] This is due in part to mobile radio's ability to have 'one-to-many' communications – something mobile phones cannot currently accommodate.

This category of user has created the need for mobile radio networks, and also drives the need to upgrade the capacity of networks. In contrast, other users may be able to use alternative forms of mobile communications, such as mobile phones.

Further, the cost of adding users other that the 'Big 6' law enforcement, public safety and emergency services agencies is likely to remain small as long as the GRN operates with spare capacity.

Maintaining a margin of spare capacity in day-to-day operations would presumably be a risk management measure that ensures that sufficient GRN capacity is always available to meet the demands on it should a widespread emergency arise.

[18] Terms of Reference, p 2. We categorised the users in Table 3.3.

There are 2 fundamental approaches to the allocation of costs between users. They are:

- the 'impactor pays' approach, or
- the 'beneficiary pays' approach.

In the first approach only impactors pay to cover the cost of the network. In the second approach every user pays. Approaches that blend these 2 extremes are also possible. For example, in what might be primarily an 'impactor pays' approach, we might seek some contribution towards the fixed network costs from all users who benefit from being connected to the network.

5.1.1 Impactor pays versus beneficiary pays

The 'impactor pays' approach allocates the costs of providing the network's services to the users that create the need for these costs to be incurred. These are the users who could not effectively function without the network, and drive most of its costs. From this viewpoint, all other users are on the network because it provides more cost-efficient services to underpin their business needs than other alternatives (such as mobile phones).

In the case of the GRN the Big 6 agencies are clearly the main impactors. There may be a case for specific treatment for the ACTES amongst the 6, and for specific treatment of RailCorp because some of the GRN has been built for it to use along rail corridors, including tunnels. We consider these cases shortly. For the rest, the cost of adding them to the network would be a relatively small cost unless the GRN were operating at full capacity.[19]

If we were to apply a pure 'impactor pays' approach in allocating the GRN's costs among users, the Big 6 agencies would likely be required to pay prices that ended up covering almost all of the costs of establishing and maintaining the network (leaving aside RailCorp and the RTA for the moment). All other users would face prices that did no more that cover the marginal cost of having them on the GRN. This would be a low, but not zero, price (which would also prevent them from treating the network as a free good and thus being induced to over-use it).

The 'beneficiary pays' approach allocates costs to users based on the fact that they derive benefits, or stand to derive benefits, from being on the network. If we were to apply this approach we would allocate costs among all users, in proportion to the benefit they derive from the network.

[19] Maintaining a margin of spare capacity in day-to-day operations would presumably be a risk management measure that ensures that sufficient GRN capacity is always available to meet the demands on it should a widespread emergency arise.

The advantages of 'impactor pays' relative to 'beneficiary pays' in this review are that:

- it would ensure that those users that drive the need for the GRN will pay prices that reflect the cost of meeting that need
- it would encourage smaller agencies (some of whom have their own conventional or other types of networks) to make more use of the GRN because they will only be charged what it costs the Telco Authority to grant them (greater) access or to facilitate their relatively small traffic volumes.

The disadvantage is that it would prevent the Authority from recouping from other beneficiaries some contribution to the fixed costs of providing the network. (It would not necessarily charge a price that fully reflects the value of the benefits because this might discourage such beneficiaries from remaining on, or connecting to, or using the GRN.)

Apart from charging prices that are well above marginal cost, a disadvantage of 'beneficiary pays' under full cost recovery is that it would make use of the GRN less attractive. If some agencies terminated their connection to the GRN in response to its higher prices, the cost to the remaining users would be correspondingly increased.

5.1.2 Possible special cases

Within the 'impactor pays' approach, the ACT Emergency Services is the only one of the Big 6 that may require separate treatment because it makes localised use of the GRN. It may not be appropriate, therefore, to charge the ACTES in the same way as the other impactors are charged.

Similarly, it may be inequitable to charge the full price to an isolated sub-unit of user within the Big 6 that is registered on the GRN for emergencies only. The Telco Authority has suggested that this would be the case for, say, a RFS crew in Bourke who need the GRN very infrequently.

RailCorp had parts of the GRN built to service its specific needs. There may be a case, therefore, to charge it more than other non-Big 6 users to reflect this fact. This reasoning might also apply to other essential service providers.

There may be a case for special pricing for the state-owned corporations to ensure that competitive neutrality principles are met. We consider this later in Chapter 7.

IPART seeks comments on the following

5 Should we allocate costs between categories of users primarily on an impactor pays or a beneficiary pays approach, or on an approach that blends the 2 or on some other approach altogether?

6 Deciding on the price structure and other issues related to setting prices

Once we have allocated the total efficient costs between users, the next step in the proposed pricing methodology is to set prices that generate sufficient revenue to recover these costs. To do this, we will need to decide on:

- the appropriate price structure, including the relative levels of revenue to be recovered from fixed and variable (usage) charges, and what the unit of consumption or usage should be (eg terminals, connection time)
- whether to include any other features in the price design
- the forecast access/usage of the GRN over the determination period.

The sections below discuss each of these decisions.

6.1 Deciding on the appropriate price structure

In designing tariffs we will consider the appropriate balance between any fixed and variable (usage) components, and what the appropriate unit of service on which the variable component is to be based.

6.1.1 The balance between the fixed and usage components of tariffs

Good regulatory practice suggests that fixed costs should be recovered through fixed charges and variable costs should be recovered through variable charges. The benefit from doing so is that the volatility in the revenue stream would reflect the volatility in costs since both would fall and rise as the service demanded ebbs and flows. In short, an alignment of the nature of the cost with the nature of its recovery will lead to a consistent level of cost recovery.

It appears that the costs of the GRN, like all network businesses, are largely fixed in the short to medium term. This indicates that an efficient pricing structure would recover costs primarily through fixed charges. The fixed charge could be a flat fee per agency, the size of which might be set by reference to the number of terminals each agency registers or by some other means of allocation.

Even if the fixed fee differed between users, the case against relying on fixed charges alone is that they induce over-usage of the network. They might also discourage new users onto the network, although that might be circumvented by a low fixed charge for new users.

We could also design tariffs that were wholly variable by charging per handset or per minute of calls made. Finally we could have a fixed and variable component to each price, as is done with utilities bills.

6.1.2 The unit of consumption

A price per unit of usage implies that we have a good proxy for usage. For illustration, assume that the proxy for consumption is the number of *registered* terminals on the GRN.

If there is no fixed component in the price, simply knowing the number of registered terminals allows us to price them. Under a pure 'beneficiary pays' approach, one price is charged that reflects the total costs of the GRN divided by the number of terminals. The price is $ per terminal per annum.

Under a pure 'impactor pays' approach only the number of terminals registered by the law enforcement, public safety and emergency services would matter. Since their terminals appear to be about 85% of the total, the price per terminal for the Big 6 would likely be higher than under the beneficiary pays approach.[20] Other users would pay a small price per terminal per annum (reflecting of the fact that they cannot be added into the GRN at zero marginal cost).

We could set charges based on the number of *active* terminals, but, since users can 'deactivate' their terminals during periods of low or no usage, charging based on registered terminals provides a steadier revenue stream to the Telco Authority and makes cost-reflective pricing more straightforward. Another pricing option would be to set one price for an active terminal and another (lower) price for an inactive terminal.

Aside from the number of terminals, other units of consumption might be:

- the number of bases/sites required at peak times by an agency
- the number of connections to the network (traffic), or
- the duration of each connection.

Alternatively, it may be possible to charge on the same basis as mobile phone networks. Agencies could be levied a fixed charge based on the number of active terminals, and a flagfall for each call with a charge for time spent on the call.

[20] That is, unless the prices faced by agencies outside the Big 6 were so high under the beneficiary pays approach that they withdraw from using the GRN altogether, leaving the Big 6 to pay for up a much higher proportion of the GRN revenue requirement than otherwise.

In line with the terms of reference, whatever unit of consumption we decide on, it needs to be consistent with a pricing methodology, simple and equitable to implement.

IPART seeks comments on the following

6 What is the appropriate balance between fixed and variable charges? What is the justification for this balance?

7 What is the most appropriate unit of consumption? If it is terminal numbers, are there grounds for setting different prices for active and inactive terminals?

6.2 Deciding on other tariff design features

There are several other features we could consider including in the design of the tariffs for the GRN. Some may not be practical or simple and equitable.

6.2.1 Time-of-use pricing

Tariffs could be designed so that users are charged more for services during peak periods of demand on the network. The GRN's peak usage periods are typically during emergencies, rather than a specific time of the day.

Depending on the extent to which customers respond to price signals, time-of-use pricing could free-up network capacity for communications in an emergency. However, it could also have unintended consequences such as discouraging emergency use of the network, or unanticipated high bills for users that unknowingly access the network during an emergency.

6.2.2 Distance-based pricing

Tariffs could be designed to reflect the different costs of providing the network's services in different areas and across different distances. The differences between users may mean that it is not equitable to charge customers a flat rate for communication anywhere in the state. Instead, it may be more appropriate to vary the charge depending on the location or the distance of communication.

Alternatively, the charge could vary depending on the number of sites accessed. This option is the most accurate measure of the demand on network infrastructure costs. This method may best match the revenue stream to the capital used. Essentially an agency that uses the most sites should contribute to the total network costs given that sites are a key cost driver. However, it is probably the most difficult option to implement.

Distance-based pricing could be used in combination with the impactor or beneficiary pays approach and could be designed to recognise the location of the user, or the distance over which it communicates, or possibly both. This approach might be considered equitable, as it recognises the higher cost of relaying communication across a wider area because of a greater number of sites required.

If we were to use the location-based approach in pricing the GRN's services, those users located in the metropolitan or greater metropolitan area may pay a smaller proportion of the costs because of the economies of scale of providing radio services in densely (user) populated areas. Those located in regional and rural areas may pay a larger proportion because additional investment is required to service more remote radio network assets in less densely populated regions.

6.2.3 Premium for high-priority access

A third potential tariff design feature is charges based on whether the user needs high or low priority access to the network. For example, during times of peak usage (ie, in emergencies), the GRN may reach full capacity at key points so that the next caller will not be allocated a frequency. To help manage this risk, some users could be charged a higher tariff that gives them priority access over users on a lower tariff.

IPART seeks comments on the following

8 Is some form of time-of-use pricing, distance-based pricing or a premium for high-priority connection to the GRN appropriate?

9 What would constitute equitable pricing of the GRN services used by the ACT Emergency Services, RailCorp, other essential service providers and isolated infrequent users?

6.3 Forecast demand and cost recovery in 2011/12

Whatever the prices we recommend, their ability to recoup the GRN's total costs will only be as good as the accuracy of the forecast demand to which they are applied. We expect that the Telco Authority will provide us with its forecasts during the course of this review.

In all likelihood, the methodology will not be able to avoid some under- or over-recovery of costs on an annual basis. In our pricing reviews, a building block is often combined with a multi-year price path that can be corrected for under- or over-collections. This may also occur with the GRN over time, since it is likely that the application of the pricing methodology will have to be applied in stages as the size and shape of the GRN and its costs evolve.

As it is likely that we will be involved in a multi-stage application of the methodology, the extent of the under- or over-collection would be an additional consideration to be addressed.

7 Assessing the impacts of prices on users and others

7.1 Impact of price increases on users and others

We are required to define how much full cost recovery for the GRN will cost users, the insurance industry and local governments. This requires us to understand the size and significance of the various arrangements and the services to which they relate.

Since GRN charges are an operating expense for all its users, it would be helpful if we could be informed on:

- the size of the GRN charges paid by each user in recent years (in 2009/10 and expected to be paid in 2010/11), and
- their size relative to the total business operating costs (excluding depreciation and interest) incurred by the users across the whole range of their businesses in 2009/10 and expected in 2010/11.

It would also be helpful if users that are funded by statutory contributions could indicate the size of those contributions in 2009/10 and 2010/11.

Confidential information may be supplied in the manner mentioned in the *Invitation for submissions* on page iii.

IPART seeks comments on the following

10 What was the size of your charges and bills for access to the GRN in 2009/10 and 2010/11, and what proportion of the total business operating costs (excluding depreciation and interest) did the bills represent in those years?

11 If you were funded by statutory contributions, what was the size of those contributions in 2009/10 and 2010/11 and what proportion related to the charges levied on you by the GRN?

7.2 Protecting users from price shocks

When fully cost reflective prices are introduced, the initial price shock to users can be very large. Where this is the case, we usually consider phasing in full cost recovery over several years, to reduce these price shocks. This effectively allocates some of the costs to the Government, because it would normally cover any shortfall in the period when the revenue generated from users does not recover the full costs.

As examples, we recommended a phasing-in of fully cost reflective prices over 10 years in our 2005 *Review of Infrastructure Pricing at Perisher Range Resorts*. In our recent State Water price review, we capped price rises in certain valleys.

It may be appropriate to phase in fully cost reflective prices for the GRN if the difference between current prices and those we recommend is significant.

7.2.1 Community service obligation payments

Even when the introduction of fully cost reflective prices does not result in large increases for users across the board, some individual users may face significant price rises. For example, this may be the case for the non-government agencies that use the GRN.

If so, it may be appropriate for us to recommend that the Government make targeted Community Service Obligations (CSO) payments to such agencies. One option is a rebate against the price or a percentage of the bill. Another option is a scheduled concessional charge as we recommended in our 2005 *Review of Rental Arrangements for Crown Land Communication Tower Sites*.

IPART seeks comments on the following

12 Whether it is justified to phase in full cost recovery or to recommend Community Service Obligations, and how either approach should be applied?

8 Other issues

The terms of reference also require us to consider a range of issues, including:

- the future cost impacts on NSW mobile radio users from changes the Australian Communications and Media Authority (ACMA) makes to the pricing and availability of radio spectrum, and
- the application of competitive neutrality principles for public trading agencies that use the GRN.

8.1 National radio communications developments

Government jurisdictions nationally have been allotted a prescribed and dedicated allocation of spectrum in the 400MHz band in which to operate their mobile voice radio communications. ACMA has set a timeline to 2018 for agencies to transition to the government allocation outside of congested areas. Areas identified as congested are to transfer by 2015.[21] The allocation will be governed by a 'spectrum license' with costs still to be determined by the ACMA.

8.2 Competitive neutrality

In broad terms competitive neutrality requires that government businesses receive no competitive advantages over their private sector competitors simply because of their public ownership. Competitively neutral government businesses are required to:

- charge prices that fully reflect costs,
- pay, or include an allowance for, taxes and charges paid by the private sector,
- pay commercial rates on borrowings,
- generate commercially acceptable profits, and
- comply with the same regulations that apply to private businesses (eg, planning and environmental laws).[22]

21 http://www.acma.gov.au/webwr/_assets/main/lib311921/the_way_ahead-400_mhz_band_plan.pdf.

22 Productivity Commission Website: www.pc.gov.au/agcnco/competitiveneutrality.

In NSW the application of competitive neutrality principles may require adjustments to the price of a good or service that reflects:

- taxes not paid by a government business but would be paid by a private sector competitor
- the cost of capital, and
- any of other material costs not borne by a government business purely as a result of its public ownership status.[23]

It is not apparent to what extent, if any, that full cost pricing of the GRN would depart from these principles since all users would at least pay the marginal cost of connecting them to the GRN, whether an 'impactor pays' or a 'beneficiary pays' approach were adopted.

IPART seeks comments on the following

13 What are the implications of national developments and the application of competitive neutrality principles for this review?

14 Are there other issues relevant to this review, and, if so, what are they?

[23] NSW Treasury, *Policy Statement on the Application of Competitive Neutrality*, January 2002, p 1.

Appendices

A Terms of reference

Ref: DPC10/00278-003

Mr James Cox
Chief Executive Officer
Independent Pricing and Regulatory Tribunal
Level 8
1 Market Street
SYDNEY NSW 2000

23 NOV 2010

Dear Mr Cox

Review of pricing for NSW Government Radio Services

The Government recently approved the establishment of a NSW Government Telecommunications Authority, and the application in 2010-11 of full cost-recovery principles for the future provision of NSW mobile radio services.

Under Section 9 of the *Independent Pricing and Regulatory Tribunal Act 1992*, I request the Independent Pricing and Regulatory Tribunal (IPART) to provide assistance to the Hon. Paul Lynch MP, Minister for Commerce, in relation to pricing of mobile radio services.

I have provided draft terms of reference for the Review for your consideration and further discussion. I note that IPART's Local Government Cost Index which already includes categories related to mobile radio would necessarily inform the Review.

In conducting this investigation the IPART should consider the attached Review of Mobile Radio Services prepared by the Department of Premier and Cabinet, in consultation with NSW Treasury and the Department of Services, Technology and Administration.

The IPART is requested to report to the Minister for Commerce for the pricing regime to commence on 1 July 2011. Treasury will fund the reasonable costs of undertaking this study so that the IPART can report within this timeframe.

Should you have further enquiries please do not hesitate to contact Mr. Peter Connelly on 9228 5017.

Yours sincerely

Kristina Keneally MP
Premier

GPO Box 5341, Sydney NSW 2001 ■ P: (02) 9228 5239 ■ F: (02) 9228 3935 ■ www.premier.nsw.gov.au

Final Terms of Reference

Background

On 6 October 2010, the Cabinet Standing Committee on the Budget (Budget Committee) made determinations on NSW Government Mobile Radio Services.

The Committee approved the application in 2010-11 of full cost-recovery principles for the future provision of NSW mobile radio services.

Furthermore, the Committee requested that the Independent Pricing and Regulatory Tribunal (IPART) review pricing for mobile radio services for user agencies from 2011-12 with terms of reference to be confirmed in consultation with IPART.

In general mobile radio services fall into three broad categories - mobile voice, mobile data and fixed data (SCADA - Supervisory Control and Data Acquisition - and paging) services.

The mobile voice networks are either shared or multi -agency (the NSW Government Radio Network) or single agency only.

The NSW Government radio network and the ACT Government radio network are effectively one integrated network with a shared network operations control centre. The ACT Government currently contributes to the capital and recurrent costs of operating the GRN based on the proportion of their use of the centre network infrastructure.

Terms of Reference

The review will:

1. Develop a pricing methodology (methodology) based on full cost recovery principles for application to users of shared mobile radio network infrastructure. The methodology would take into account the current and future operating and capital costs to maintain shared networks. It would be both simple and equitable to implement.
2. In developing the methodology, take into consideration applicable risk factors including:
   - The future cost impacts on in-scope NSW mobile radio users from reforms by the Commonwealth Government (Australian Communications and Media Authority) for the pricing and availability of radio spectrum.
   - The future cost impacts on government and non-government user agencies based on their different requirements for shared mobile radio network usage and coverage levels.
   - The application of competitive neutrality principles for public trading agencies that are users of the shared mobile radio network infrastructure.

- a phased introduction of the proposed state-wide service.

3. Provide advice on the cost impact of the proposed methodology on eligible users and government agencies from 2011-12. This will enable the Government to assess the implications of the new methodology for user agencies.
4. Examine the cost impact and implications of the proposed methodology on statutory contributions for mobile radio for
   - the insurance industry and
   - local government, noting that IPART's Local Government Cost Index already includes categories related to mobile radio such as operating leases, emergency service levies, and telecommunications services.
5. Based on the proposed methodology, recommend prices to commence on 1 July 2011.

Scope

Lead law enforcement, public safety and emergency service organisations (NSW Police Force, NSW Fire Brigades, Ambulance Service of NSW, the Rural Fire Service and the NSW State Emergency Service) have the most critical operational need and requirements for mobile radio services.

However, other essential service providers (such as transport, water and energy suppliers) rely on mobile radio services for their business operations and in times of emergency.

There are about ten entities which are not NSW Government entities (nor State Owned Corporations) who use the government mobile radio network. These entities such as CareFlight and the Department of Defence account for about 2 per cent of the total number of registered handset devices.

The ACT Emergency Services account for about 8% of the total number of registered handset devices. The way in which the ACT contributes to NSW capital and operating costs is in scope.

Mobile data services, other than the Mobile Data Radio Network, and SCADA systems are out of scope.

IPART is requested to consult with key stakeholders.

Timing and Resources

The review is to report to the Minister for Commerce in order that a pricing regime commences on 1 July 2011.

The Department of Services, Technology and Administration will provide senior officer level support to the review team.

B Premier's memorandum 2010-16

0 6 DEC 2010

NSW GOVERNMENT

MEMORANDUM NO. 2010-16
(Memorandum to all Ministers)

Government Mobile Radio Services

The Government has established the Telecommunications Authority (Telco Authority) within the Department of Services, Technology and Administration. The Telco Authority will aim to achieve improved levels of service delivery for government mobile radio users through a more integrated and more cost efficient delivery of mobile radio infrastructure and services.

In order to drive greater operational effectiveness and cost efficiency, all NSW Government owned mobile radio service network infrastructure, assets and associated budget allocations will be vested in the Telco Authority, unless it can be demonstrated by the releasing agency that this would not be appropriate.

The Telco Authority will be overseen by a Board which will report to a Cabinet Committee. The Telco Authority is comprised of staff from the Department of Services, Technology and Administration and staff from other government departments and entities which utilise radio services.

The Board will consist of a mix of independent advisors and members representing key government sectors.

The Telco Authority will:

a. develop a sector-wide policy framework for mobile radio and related services, in consultation with affected agencies, including spectrum acquisition and allocation.

b. undertake a comprehensive audit of existing mobile radio infrastructure and an operational needs assessment and, in consultation with affected agencies and the local government sector, develop a state-wide strategy and an implementation plan for government mobile radio services that addresses:
   - mobile radio service standardisation;
   - network rationalisation;
   - centralised acquisition and maintenance of assets, including infrastructure and equipment refresh cycles for all networks;
   - coverage provisioning to growth areas;
   - funding challenges in meeting future demands, including assisting affected agencies to move to alternate technologies where appropriate; and

- escalation arrangements via the recommended governance mechanisms to ensure that unresolved issues are considered by the appropriate level of decision-makers, including to a Cabinet Committee level.

c. provide mobile radio network services in the following priority order:
   - consolidate the GRN and the New South Wales Police Force's (NSWPF) conventional networks within the GRN metropolitan footprint;
   - consolidate agencies' conventional networks operating outside the GRN footprint, with a focus on emergency and essential (utilities) services;
   - integrate the consolidated conventional networks and the consolidated GRN/ NSWPF network to create a single state-wide mobile radio service.

d. provide mobile radio network services (infrastructure, sites and other elements as appropriate) on cost-recovery principles, charging tariffs based on the number of handsets able to be used on each network (SOCs would fund their own networks or utilise the NSW Government's network(s) on a commercial basis); and

e. manage, in accordance with user service requirements, all NSW Government mobile radio network assets, infrastructure, equipment and other capital (with the exception of assets vested in SOCs and Local Government, unless mutually agreed with the Telco Authority).

At any one time, the supply of electromagnetic spectrum is relatively static, while the demand for it is rapidly increasing. Much of the demand is commercially driven, making spectrum a valuable resource. In order to maximise availability of spectrum for appropriate agencies in NSW, it is critical that spectrum is allocated where a genuine operational requirement is evident.

Furthermore, the Australian Media and Communications Authority (ACMA) has proposed to allocate a specified quantum of spectrum in the 403-430MHz and 450-470MHz bands for the use of state and territory governments, primarily, but not exclusively, for law enforcement and public safety purposes.

To ensure appropriate allocation of spectrum, all negotiations with ACMA in relation to mobile radio frequency allocation on behalf of any NSW Government agency will now be conducted by the Telco Authority and agencies are not permitted to approach ACMA directly on spectrum and related matters.

This approach will ensure that a coordinated and strategic approach to radio spectrum allocation is undertaken by the NSW public sector.

Kristina Keneally MP
Premier

Issued:	Telecommunications Authority, Department of Services, Technology and Administration
Contact:	Anthea Kerr
Email:	anthea.kerr@services.nsw.gov.au
Telephone no:	(02) 9372 8745
Date:	25 November 2010

This memorandum has superseded Premier's Memorandum M2002-24 Coordination of Radio Spectrum Management for NSW Agencies.

C Users of NSW government radio networks

Users of either the GRN or their own conventional networks are listed below, grouped into the 3 major categories discussed in the text. Those users who only use their own network are shown in *italics*.

Table C.1 Users of NSW government radio networks

Category of user	Agency
Law enforcement, public safety and emergency service organisations	*NSW Police Force*
	NSW Rural Fire Service
	NSW State Emergency Service
	Ambulance Service of NSW
	Fire and Rescue NSW
	Australian Capital Territory (ACT) Emergency Services
NSW essential service providers in electricity, water and transport	Ausgrid (formerly EnergyAustralia)
	Integral Energy
	Country Energy
	Sydney Water Corporation
	Hunter Water Corporation
	State Water Corporation
	Sydney Catchment Authority
	TransGrid
	Delta Electricity
	Eraring Energy
	Macquarie Generation
	RailCorp
	State Transit Authority
	Sydney Ports Corporation
	Newcastle Port Corporation
	Port Kembla Port Corporation
Other NSW Government agencies and departments	NSW Health
	Roads and Traffic Authority of NSW
	Corrective Services
	Juvenile Justice
	DSTA
	Department of Environment, Climate Change and Water (NPWS)

Category of user	Agency
	Department of Justice and Attorney General
	NSW Maritime
	Sydney Harbour Foreshore Authority
	Land and Property Management Authority
	Transport NSW
	Independent Commission Against Corruption
	Department of Premier and Cabinet
	Independent Transport Safety Regulator
	NSW Industry and Investment (Forests NSW, Fisheries)
	SAS Trustee Corporation
	Penrith Lakes Development Corporation
	Communities NSW
	Sydney Olympic Park Authority
	Lord Howe Island Board
	Education and Training (including TAFE)
	Zoological Parks Board of NSW
	Ageing, Disability and Home Care
	Royal Botanic Gardens and Domain Trust
	Jenolan Caves Reserve Trust
	Powerhouse Museum
	NSW Parliament
	Upper Parramatta River Catchment Trust
	Wild Dog Destruction Board
	Sydney Opera House Trust
	Australian Museum Trust
	Centennial/Moore Park Trust
Other: – Non-NSW Government agencies and departments	Australian Broadcasting Corporation
	Australian Rail Track Corporation
	Department of Defence
	Central Tablelands County Council
	Sutherland Shire Council
	Institute of Sport
	Snowy Hydro Limited
Other: - Non-government organisations	CareFlight
	Chevra Hatzolah
	Surf Life Saving Australia
	Child Flight

Source: DPC, *Strategic Review*, Attachment 2, October 2010, and updates by IPART and DSTA.

D Our approach to estimating the return on capital

We apply a weighted average cost of capital (WACC) to an agency's asset base to derive a return on capital. The WACC is the weighted average of the cost of debt and equity and a number of parameters must be specified in deriving it.

Our standard approach for network businesses uses a range for the values of a real pre-tax WACC based on several market-based parameters and several, assigned, non-market parameters. As an example, Table D.1 shows the parameter values we adopted in our recent decision on pricing the services of the NSW Office of Water (NOW).

Table D.1 Parameter and WACC valuations adopted in the NOW 2011 decision

	Value
Market-based parameters	
Nominal risk free rate	5.4%
Inflation adjustment	2.9%
Debt margin	1.6% - 4.1%
Non market-based parameters	
Market risk premium	5.5% - 6.5%
Debt to total assets (gearing)	60%
Gamma	0.5 - 0.3
Tax rate	30%
Equity beta	0.8 - 1.0
WACC range (real pre-tax)	**5.7% - 8.6%**
WACC mid-point (real pre-tax)	**7.1%**

Source: IPART, *Review of prices for the Water Administration Ministerial Corporation – Final Decision*, February 2011.

The market-based parameters are dependent on current market rates and the type of industry. We will update these prior to calculating the WACC to be applied to the GRN. Of the non-market-based parameters, the market risk premium, tax rate and dividend imputation factor do not vary with the nature of the business but the equity beta, capital structure and debt margin usually do. Since it is well known that risks may vary between industries, we would investigate the industry-specific parameters appropriate for mobile radio assets.