Ministry of Economic Development Manatu Ohanga | Radio Spectrum Management

Summary of submissions and conclusions

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Executive summary

This report summarises the Ministry's current view of the effectiveness of the current Radio Licensing Regime (RLR) to meet the changing needs of private and public users in order to maximise the value of spectrum to New Zealand society.

The Ministry released a discussion document entitled Spectrum Management in the Radio Licensing Regime in April 2009 to invite public feedback on Ministry thinking and to gather better information about the state of spectrum allocation under the Radio Licensing Regime.

In general, the evidence from stakeholders suggests that the regime as a whole is working well and wholesale changes are not desired. Nonetheless a few specific problems, such as congestion in K band fixed services [Studio to Transmitter Links (STLs) broadcasting links in the 915-921 MHz band] will warrant further consideration on a case-by-case basis.

Stakeholders largely endorsed the way the Ministry approaches issues, such as congestion, when they arise. Some interest was shown by submitters in potential options that may further improve the licensing regime.

This feedback has informed plans for further work, outlined in this report. The Ministry intends to strengthen its forecasting of trends in spectrum use under the Radio Licensing Regime through ongoing reviews of demand (in order to address bottlenecks before they occur) and with a more systematic and proactive approach to enabling new emerging technologies.

1. Introduction

This report summarises the results from consultation on the review of spectrum management in the Radio Licensing Regime (RLR).

The Ministry released a discussion document entitled Spectrum Management in the Radio Licensing Regime in April 2009 to invite public feedback on Ministry thinking and to gather better information about the state of spectrum allocation under the RLR.

Although the discussion document concluded that there was no pressing need for reform of the Ministry's approach, potential options were put forward as possibilities for additional flexibility.

The main part of this report summarises the key issues that have arisen from submissions and officials' initial analysis:

- background and overview of submissions;
- government objectives in managing the RLR;
- description of the problem and status quo;

potential options for improvement, including enhancements to the status quo (non-regulatory); conversion of RLR spectrum to the Management Rights Regime (MRR); and use of incentive pricing mechanisms in the RLR;

conclusions and next steps.

A full list of the questions asked in the discussion document is included in an appendix.

2. Background

It is important that Government and industry have confidence that the spectrum allocation and management arrangements will continue to meet changing demand from a wide range of users. Ongoing reviews of the arrangements are a part of the quality assurance process.

Spectrum management in New Zealand is governed by the Radiocommunications Act 1989. The Act provides two parallel regimes for spectrum management:

The Management Rights Regime (MRR) provides for the creation and sale (by competitive auction) of tradable spectrum property rights over a defined frequency band, nationwide, for a specified period (usually 20 years). It permits the rightholder to create and assign spectrum licences to enable particular uses within that band. This regime covers most of the higher-value commercial uses of spectrum such as broadcasting, cellular mobile, and fixed wireless access services.

The Radio Licensing Regime (RLR) allocates spectrum to particular uses on an administrative 'first-come, first-served' basis and is not subject to competitive allocation. Security of tenure is limited (five years, or less with a transition plan), although licences are normally renewed until the licensee opts to cancel. This regime supports a wide range of critical commercial and non-commercial services including high capacity back haul telecommunications and broadcasting networks, land mobile radio, and public safety communications.

Compared to the MRR, the effectiveness of the RLR has received little attention since the enactment of the Radiocommunications Act 1989[1]. Consultation was therefore undertaken to take a more focused look at the issues and ensure that the RLR continues to meet the needs of spectrum users.

Footnote

[1] Various reviews of spectrum management as a whole touched on issues around the Radio Licensing Regime. The 2005 review raised concerns about potential competition issues with spectrum management under the regime. A major review of the Radiocommunications Act in 2000, however, found only minor issues with the current regime, which were addressed through legislative changes.

2.1 Demand pressure on Spectrum

Because resource pricing or market mechanisms (e.g. auctions) are not used in spectrum assignment under the RLR, there is little incentive to use spectrum efficiently. However, this only has an economic impact if spectrum is scarce. To inform its analysis, the Ministry therefore commissioned a technical study of demand and supply for spectrum under the RLR.

The discussion document concluded that there are no substantive problems in the regime and demand was being satisfied. While there are some instances of congestion currently being addressed, the Ministry proposed to maintain the status quo – that any interventions should continue to be considered on a case-by-case basis, using evidence-based analysis to inform potential replanning or conversion to the MRR.

Although the discussion document concluded that there was no pressing need for reform of the Ministry's approach, potential options were put forward as possibilities for additional flexibility in response to particular potential problems or should congestion become a widespread problem in the future. The analysis was deliberately kept at a high level to reflect the early stage of policy development and to invite discussion from stakeholders.

2.2 Submissions

Seventeen submissions were received from commercial providers of telecommunications and broadcasting services, from various public sector agencies including the New Zealand Defence Force, Police, the Department of Conservation (DoC), and from iwi groups. Submitters were given six weeks to respond to the discussion document. MED received submissions from:

	Organisation name

1	Peter Farrell
2	Tesa Limited
3	Department of Conservation (DoC)
4	Vodafone
5	Te Taitokerau Iwi
6	New Zealand Defence Force (NZDF)
7	Telecom
8	Motorola
9	Teamtalk Ltd
10	Te Huarahi Tika Trust
11	Sky Network Television Ltd (Sky)
12	Kordia Ltd
13	New Zealand Police
14	Radio Broadcasters Association (RBA)
15	Radio Frequency Users Association of New Zealand (RFUANZ)
16	Two Degrees Mobile Ltd (2degrees)
17	Mount Campbell Networks Ltd

3. Objectives of spectrum management

A key objective of spectrum management in New Zealand is to minimise harmful interference between uses. For most uses, this requires exclusive allocation of a frequency in an area. Therefore, the Government aims to ensure that spectrum is allocated to the uses that New Zealand society values most.

The discussion document applied the Code of Good Regulatory Practice, (administered by Treasury and endorsed by Cabinet in CAB Min (08) 25/1) to spectrum management. These principles include:

Efficiency, encompassing both technical use of spectrum and value of end-use;

Effectiveness, including Clarity and certainty for investment; and

Equity, including Transparency and fairness among spectrum users. This also includes providing public services and delivering particular Government objectives.

These can be defined further in terms of:

maximising allocative and dynamic efficiency (with less emphasis on technical and productive efficiency), that is, maximising values of outputs and services provided through radio spectrum, and innovation and productivity gains in the longer term;

ensuring spectrum allocation does not unnecessarily inhibit competition, provides appropriate incentives for investment, and facilitates uptake of new technology as it emerges;

providing adequate interference protection and reliable means to resolve interference problems that minimise transaction costs, as well as allowing as much technological neutrality as possible; and

ensuring that public services are adequately provided for.

3.1 Reactions to the objectives

Submitters largely approved of these goals. Some claimed that the criteria were too hard to measure and that the Ministry has not done enough work to evaluate its performance against the objectives. The intention of the discussion document was to gauge stakeholders' opinions as to the appropriate objectives. The Ministry acknowledges that criteria for gauging how the RLR measured up to the objectives was not established as this was outside the scope of the discussion document. The Ministry considers that further work, in the form of an academic study into benchmarking spectrum valuation, should be considered to respond to stakeholder concerns

3.1.1 Technical and productive versus allocative efficiency

Some of the submissions recognised the discussion document's distinction between spectrum management aiming for technical efficiency (for instance by encouraging existing users to upgrade to better equipment in order to utilise less spectrum to deliver the same service) and allocative efficiency (encouraging utilisation of spectrum for the end uses most highly valued by consumers). These submissions tended to support aiming for technical efficiency over economic, suggesting that the RLR is better suited to facilitating particular uses that occupy the minimum necessary amount of spectrum through rigorous engineering, rather than encouraging particular end uses or economic outcomes – especially where there is no scarcity and therefore negligible opportunity cost associated with deploying equipment to specific frequencies.

3.1.2 Competition

2degrees submits that the light-handed and self-regulatory approach to regulation in New Zealand is internationally regarded as a disaster, and that there is enough evidence to support a departure from the current regime, including:

Interference problems;

Lack of competition in mobile market and closed networks[2].

2degrees contends that synchronisation with competition law needs to become the theme for spectrum management in New Zealand and that a major problem is gaining access to closed networks.

These comments go well beyond the scope of the current review, but do address some of the competitive issues that can arise if spectrum is converted to management rights while a market is still developing. These comments have informed the analysis below on the option to convert spectrum under the RLR to management rights. Both the Ministry and the Commerce Commission continue to work on a number of policy inputs affecting the mobile business, with the aim of improving competition and service outcomes for consumers.

Footnote

[2] The Ministry understands that this refers to an incumbent operator effectively limiting competitive access to an existing network service.

3.1.3 Maori interests

Te Huarahi Tika Trust submits that there remains unfinished business in relation to Crown obligations to Māori in relation to the radio spectrum. It contends that any conversion of spectrum to the MRR without specific consultation with Māori is inappropriate and that Māori should not have to pay for rights to use the spectrum. Te Taitokerau Iwi also suggests that the Crown partnership with Māori under the Treaty needs to be recognised as a mandatory consideration in spectrum management affairs as part of its Treaty of Waitangi obligations.

The potential for Māori spectrum rights under Article Two of the Treaty of Waitangi was considered by the Waitangi Tribunal under Claim WAI 776 in 1999. The majority view found that the radio spectrum was known to Māori, was taonga, and was therefore subject to the Treaty. The minority view from the Presiding Officer did not accept that finding, but did accept that the Crown had failed in adequately protecting Māori language and culture.

Cabinet, in 1999, declined to accept the view that the principles of the Treaty require that Māori be given a share of rights to the spectrum but noted that there was an ongoing obligation to promote and protect Māori language and culture. It also noted that it is not necessary to reserve spectrum for the purpose of promoting Māori language and culture where ownership or control of the spectrum is not a prerequisite to ensuring access to services. The incoming Government confirmed this position to not specifically reserve spectrum for Māori in February 2000.

With respect to recent spectrum allocations undertaken by Government, Cabinet agreed that preferential bidding for a special block of spectrum at 2 GHz be restricted to parties able to demonstrate a commitment to involve Māori in spectrum development. The Crown has retained this spectrum pending purchase by the Hautaki Trust. In the UHF bands, the Māori Television Service has been granted a management right (which expires in 2013 and is currently under review) and another 25 MHz was reserved for Hautaki Ltd as part of the 2.3 GHz and 2.5/2.6 GHz auction in 2007.

The Ministry will continue to ensure that Māori interests are considered in future consultation processes concerning new spectrum allocations in order to inform Government decisions on a case by case basis.

4. Problem and status quo

As already noted, there is little incentive to efficiently use spectrum assigned under the RLR. The low cost of obtaining access to spectrum therefore creates the possibility of uncompetitive hoarding or otherwise inefficient use.

Given that there is little evidence of excess demand, the Ministry concluded in the discussion document that there is also little cause for concern around competition under the RLR. However, the study found that there are dominant players in certain frequency bands, reflected by the relatively small number of submissions that are usually received in response to the Ministry's consultations on radio spectrum issues generally. This may be problematic in the future, should the spectrum become more congested.

Submitters largely agree that the RLR is adequate in meeting current demand for spectrum. They agree with the Ministry's analysis of potential problems and the possibility of hoarding, but suggest that apart from a few isolated instances, there is no shortage in New Zealand. Congestion issues under the RLR are either unlikely to arise in the near future or should continue to be considered for re-planning and/or moving to the MRR on a case-by-case basis.

The Ministry agrees that more work could be done to enable users to request the investigation of alleged uncompetitive hoarding. This is discussed further in the next section.

4.1 Evidence of congestion issues

Submitters identified areas of current or potential congestion issues, with most being non-critical and able to be remedied, for instance via upgrading to more spectrum efficient technology or utilising other parts of the spectrum. The pressing concern in the K band for studio-to-transmitter links (STLs) in major centres was recognised by most submitters. This issue is currently being addressed with an issues paper for consultation – submissions on 806-960 MHz Band Replanning Options closed on 30 June 2009.

Telecom endorses further analysis of congestion in the K band, and points out that there are alternative means of transmitting data, particularly in urban areas with robust fibre networks. It states that any congestion should be dealt with by converting bands to management rights but there appears to be no case for such a conversion at the moment. It should be noted that the 806-960 MHz Band Replanning Options discussion document was released after most submissions on this review were received.

Overall, submitters think that the Ministry should continue case-by-case consideration of congestion rather than a wholesale change of the RLR to incorporate resource pricing (such as Administrative Incentive Pricing, or AIP, discussed in detail below) or a property rights approach (MRR). An exception is the RBA, which considers that no more bands should be moved to the MRR at all, but if any change were to occur in the future, it should apply to the whole spectrum and not be applied in a piecemeal fashion.

Most agree that the RLR is meeting the objectives described above, with some recognising that this is largely due to New Zealand's small size and a lack of demand. Some note that the Ministry has the ability to control uncompetitive hoarding behaviour by cancelling licences if they are unused. Significant resources would be required to implement this control on proactive basis and it has not been exercised to date, but there is little reason why it could not be employed in the future on a case-by-case basis, upon request and subsequent investigation.

4.2 Technical planning

While not necessarily a problem in the absence of excess demand for spectrum, consultation suggests that, consistent with the Ministry's experience, spectrum allocation under the RLR does not provide strong incentives to achieve better technical or productive efficiency by using more efficient equipment. However, the maximum capacity of spectrum is not fixed in many of the bands under the RLR and can be expanded through the introduction of new technologies. The Ministry also notes that many users are interested in migrating to newer technologies, presumably driven by consumer demand for better services, costs and availability of equipment overseas.

Some concerns were expressed with respect to forward planning and enabling the introduction of new technology. For instance, the RBA were critical of a previous lack of planning of the K band for STLs to match AM/FM band broadcast licences, which it claims has contributed to the present congestion. Longer term technical planning is an area that has been targeted by the Ministry and the submissions can be seen as an

endorsement of this prioritisation. Work is currently being undertaken to accommodate digital land mobile radio. Further enhancements are discussed below.

The Ministry considers that there is a need for ongoing review of demand trends in bands, in order to address bottlenecks before they occur. Regular surveys of spectrum usage, coupled with a more systematic and forward-looking approach to enabling new technologies as they emerge, would better place the Ministry to minimise the risk of economic disruption from excess demand in particular bands.

4.3 Costs and benefits of status quo

No quantification of the costs of congestion problems was provided by submitters, but there was some anecdotal evidence of lost business due to inability to secure a licence. Quantification of such costs is likely to require a considerable amount of time and financial resources. Likewise, it is difficult to estimate the degree of economic efficiency of spectrum use under the RLR. This requires evidence of the economic values of spectrum use, which was also not provided.

The Ministry does not consider substantial research expenses to be currently justified in the absence of clear signs of significant problems. This is an area that should, however, be investigated – especially if (for example) an incentive or resource pricing scheme was to be considered in the future.

5. Remedial options

Given the lack of evidence of potential congestion problems, submitters largely agree that the status quo is preferred for the time being. This position is supported by the current moves to upgrade from analogue to more spectrally efficient digital equipment, which can be expected to increase the supply of spectrum in some bands.

When there is no excess demand, efficiency does not pose a significant problem, and the status quo provides a reasonably effective and equitable means for allocating spectrum. However, there may be room to improve the administrative efficiency of the current regime and address problems associated with the lack of flexibility common to centralised administrative systems. This in turn could reduce costs to users by allowing them to respond to market and technological changes in a more efficient and effective way.

5.1 Considerations

A number of future options to improve the effectiveness of the RLR were considered in the discussion document. There are a number of issues which are common to all of these options. These include:

local issues concerning differences in spectrum use in different regions;

competition implications, especially in downstream markets; and

transitional issues to allow for investment and infrastructure.

5.1.1 Local issues

Congestion problems under the RLR appear to be limited to major metropolitan areas. The discussion document suggested that more localised solutions for specific frequency bands and locations may be appropriate to avoid unnecessary disruption in other areas, such as the creation of regionally defined management rights. There are various methods of achieving more flexibility with regard to geographical pressure on spectrum, including more targeted technical planning, auction of area defined spectrum licences with the Crown retaining the management right (as has occurred in the 3.5 GHz band using local authority boundaries), and creating new area-based management rights.

Views on this matter were mixed, with most being opposed and some recognising that a degree of geographic coordination already exists through the technical requirements and engineering cooperation involved in licensing specific devices or uses under the RLR. Kordia stated that creating a new form of localised management right may impose technical constraints and administrative complications on radio installations in adjacent regions.

Te Taitokerau Iwi on the other hand supported localised mechanisms such as geographical underlay and overlay, where an easement is created on an existing management right to allow another user to operate in areas where the right-holder has no equipment installed. The matters of geographically defined management rights and geographical easements for underlay and overlay would require legislative change, which can be analysed when the Radiocommunications Act is next reviewed, currently scheduled to start in 2010/11.

Submitters hinted that more analysis was needed before informed comment or support was possible. Most warned against a change to geographical administration of licences due to the possibility of increased cost, lack of central coordination, and the fact that propagation

depends on frequency, terrain and power levels, not lines on a map like local authority boundaries.

5.1.2 Competition safeguards for downstream services

In general, the Ministry's preference is to rely on the Commerce Act to resolve competition issues in the downstream markets associated with spectrum use, rather than regulating inputs, unless exceptions are clearly warranted. Such exceptions in recent auctions have included spectrum caps, eligibility rules, and 'use-or-lose' provisions.

Submitters largely agreed with this approach. Several also cautioned against premature conversion of spectrum to MRR due to the risks of un-competitive outcomes if large operators can exclude others. The RBA stated that this also applied to congested spectrum (i.e. the K band for STLs).

Kordia noted that access can be facilitated to RLR spectrum through advance planning to relieve congestion in specific bands or locations. Kordia states that, in this way, the RLR manages access problems and facilitates competition and fairness far more effectively than the MRR. Under the MRR, Kordia notes that post-auction regulation is undesirable as it can undermine the value of property rights at auction, impacting investment. 2degrees made a similar point, suggesting that there should be a power to break up 'uncompetitive closed networks' that exist as a result of earlier management right auctions and market acquisitions.

2degrees also stated that spectrum allocation should be coordinated with other elements needed for downstream competition in the mobile market, principally co-location and termination policy. The Ministry agrees that there is considerable overlap in the mobile market with the Telecommunications Act, the Commerce Act, and the activities of the Commerce Commission. These frameworks are established for particular purposes and address different policy areas, but the Ministry acknowledges that because they can jointly impact on a single business entity, the linkages need to be kept in mind and managed carefully to ensure clear communication, transparency and consistency of approach. However the Ministry also notes that this is a dynamic field and interventions often need time to 'bed in' to deliver the intended policy results.

5.1.3 Transitional issues

Spectrum use often entails a high level of investment and long-term planning. The discussion document noted that any reform of the RLR must take the needs of existing users into account and keep transitional costs to a minimum.

Submitters agree that transparency and early disclosure was important to provide certainty for incumbents and investors, with specific consultation completed for each individual band considered for conversion or replanning. Two submitters supported the approach taken previously by the Ministry in relation to improving the security of tenure in the RLR.

The RBA noted that for some business uses, including broadcasting, the creation of management rights has the potential to create two separate spectrum markets for a single business use. The RBA contends that, as a result of the recently negotiated AM/FM broadcast licence renewals, any review of licences affecting the radio industry should not happen until 2031, at which time the Ministry should consider coupling the STL and broadcasting licences as a single property right. The Ministry considers this could result in STL spectrum being underutilised as changes are made to programme distribution networks over time. It may also discourage the use of more spectrally efficient technologies.

5.2 Option 1: Enhancements to the status quo

A number of potential improvement measures to the status quo were considered in the discussion document. The improvements would not require significant changes to the current regime because the Ministry's light-handed approach to licensing means that there are few barriers for users to employ these measures if they wish. The enhancements are largely operational in nature and do not require a regulatory intervention. Submitters were split as to whether these enhancements (if adopted) should apply to all bands under the RLR or only to congested bands.

5.2.1 Devolution

It was suggested in the discussion document that the licensing function could be devolved to a third party, such as an industry organisation, to provide flexibility for users to take ownership and manage their own use of spectrum in a more efficient and effective way.

Whilst there was some support among public sector users or for particular bands on a case-by-case basis, there was general rejection of this suggestion. The ability for a group of users to exclude access for uncompetitive or otherwise inequitable reasons was seen as a major drawback. Cost, coordination, and timeliness in responding to congestion or facilitating new technology were also pointed to, with the implication that the Ministry would still need to maintain close control.

5.2.2 Improved technical planning

There was significant support for an improvement in planning, possibly with tighter technical specifications and/or through allocating more resources to spectrum planning within the Ministry. These measures will help resolve apparent congestion in certain locations or frequency bands where there is in fact no excess demand overall, and where alternatives can be found at a relatively low cost to users.

Other points made by submitters included support for facilitating uptake in more spectrum efficient technologies (such as digital) and generally endorsing the recommendation (from the recent PriceWaterhouseCoopers (PWC) business evaluation of the Ministry's spectrum management) to direct more resources towards technical planning capability.

Improved planning may help to address cases where apparent excess demand in some areas might be a result of poor coordination among users or outdated equipment standards, rather than genuine scarcity of spectrum supply. In other words, the congestion problem is primarily a transaction cost and an economically neutral outcome could be achieved by additional planning and subsequent changes. The costs and benefits of such an approach may well be positive overall, but they do not fall equally on the parties concerned, with larger users better placed to upgrade equipment before obsolescence.

The Ministry is continuing to reprioritise resources to the technical planning function in accordance with the PWC review, and agrees that there is a need for a more systematic and forward-looking approach to enabling new technologies as they emerge. This, along with longer term spectrum demand analysis and projections (discussed above in section 4.3), would better place the Ministry to identify and respond to potential congestion.

5.2.3 Access seeker regime

The discussion document suggested that it may be possible to allow users to negotiate spectrum access amongst themselves on a more formalised basis when there are competing demands for specific cases. This would be similar to the Managed Spectrum Park arrangements being introduced in the 2.5 GHz Management Right. This could achieve mutually satisfactory outcomes for the parties involved, based on the better information which they hold about their own uses. Such a process has the potential to increase the flexibility of licensing and enable more collaborative and innovative uses of spectrum. It could also enable licences to be traded on a commercial basis between individual users in specific cases where there are no markets in place.

Submitters largely rejected this proposal due to the potential cost to implement and potential for costly litigation if the Ministry doesn't remain closely involved. The limited support suggests that if pursued, it should be on a case-by-case basis, and may only be suitable in high frequency bands where coverage is limited due to the low power and directional antennas.

Te Taitokerau Iwi supports this approach and suggests more flexibility to allow alternative technologies to use parts of the spectrum would be more efficient, particularly in regions that are covered by management rights or radio licences but are unused or contain services that would otherwise be unaffected by interference.

Some submitters recognised that the current RLR is essentially an access seeker model and a large amount of cooperation already takes place, often with some facilitation by the Ministry. However, the fact that some submitters point to the ability of the Ministry to cancel licences if not in use (the 'use-or-lose' provisions in the Radiocommunications Regulations), raises the possibility that the Ministry could be more active in freeing up unused spectrum in some areas when requested. Work would need to be done to:

- make this possibility more widely known and available to users; and
- develop operational guidelines for determining 'use'

5.3 Option 2: Management rights

This option would transfer some or all frequency bands currently administered under the RLR to the MRR. This would entail creation and competitive allocation (likely by auction) of property rights over parts of the spectrum with a term of up to 20 years, subject to certain conditions. So far, the MRR has been applied to frequency bands for which there is already congestion or which are considered to be of high value due to available or potential technology and consumer demands.

Transfer to management rights may be appropriate when there are clear or potential indications of congestion, or indeed where use of additional vacant spectrum is proposed to complement existing MRR bands. Timing is a critical factor – if transfer occurs too early, it may create future competition problems, as licences can be acquired at very low cost when there is insufficient current demand.

5.3.1 Government's initial aims for MRR

When the Government reformed spectrum management in 1989, it was envisaged that all radio spectrum should be transferred to market-based property rights (the MRR). However this was subsequently not considered feasible for a range of reasons including:

spectrum was used for non-commercial objectives such as public safety, emergency or defence purposes which do not fit easily with a purely market-based approach;

the costs of conversion to management rights and re-engineering might outweigh potential benefits from market discipline; and

supply of certain frequency bands exceeds demand and is likely to be adequate for future growth.

5.3.2 Reactions to MRR

Submitters overwhelmingly rejected any conversion of RLR spectrum to the MRR at this stage, due to the lack of evidence of excess demand or widespread problems such as hoarding. There is a concern that if the spectrum was converted to management rights, spectrum could be effectively "locked up" for long periods, creating the potential for significant opportunity costs in a rapidly changing technology enhanced world, through limited competition.

Kordia noted that it would be difficult for the Ministry to use the MRR to administer fixed links (such as STLs in the K band) in a way that would meet the efficiency objectives described above. Motorola similarly stated that the use of the MRR should be limited to bands that are used for large, homogenous networks and broadcasting. This type of use typically needs contiguous blocks of spectrum for wideband or broadband technologies. The operators of these networks often target users who want access to national and international roaming or mass media communications. These uses can be distinguished from point-to-point, point-to-multipoint and land mobile two-way technologies, using narrow bands.

The Department of Conservation (DoC) agreed with Kordia and Motorola, stating that no fixed link bands above 1 GHz should be converted to the MRR. It states that an exclusive right to a portion of spectrum (for a fixed period of time usually with an automatic right of renewal) would be difficult to guarantee due to possible changes in international obligations. The competing demand for national fixed terrestrial microwave bands and international satellite services, which share common spectrum, would mean that exclusive rights are undesirable in these bands

Submitters noted a number of costs and uncertainties associated with a MRR, including potential purchase costs and feasibility of defining property rights (particularly for fixed links) and the effect on licence fee revenues (with the resulting impact on Ministry resources and capability). The major drawback was the possibility of losing access to the radio spectrum resource as new technologies and opportunities emerge, and the potential for uncompetitive outcomes in downstream markets.

Many of the comments received in relation to the potentially anti-competitive effects of management rights and spectrum auctions do not appear to take into account some of the competition safeguards that the Ministry has utilised in recent auctions. These safeguards include eligibility requirements for who can participate in auctions, spectrum caps to ensure dominant players do not dictate downstream outcomes, and specific 'use-or-lose' provisions to ensure spectrum users actually deploy equipment rather than hoarding spectrum or holding it for speculative purposes.

5.3.3 Wholesale conversion versus case-by-case consideration

Whilst the discussion document suggested that transferring spectrum to the MRR might be efficient even where there is no excess demand (because a market structure may be more responsive to emerging technologies and consumer markets), submitters generally disagreed with this suggestion. They cited the limited number of potential competitors in the relatively small New Zealand market, and the low level of secondary trading in bands already transferred to management rights.

Submitters point to the possibility that spectrum would be obtained cheaply and locked up for long periods, having a negative effect on New Zealand's ability to adapt to changing international allocations, utilise new technologies, and allow new entrants. There were also fears of incumbency and uncompetitive outcomes in the longer term – a particular criticism came from 2degrees pointing to previous cellular spectrum auctions as evidence.

The overall support for the status quo suggests that issues of congestion should continue to be dealt with on a case by case basis, and following careful analysis and consultation. Conversion to the MRR remains a useful tool, but stakeholders agree that it should not be implemented for its own sake.

5.4 Option 3: Administrative incentive pricing

Administrative Incentive Pricing (AIP) can be used with the intention of encouraging efficiency in the absence of a market. AIP has recently been introduced in the UK and a form of AIP has been used in Australia, across both private and public sector spectrum uses.

AIP is based on the calculation of 'opportunity cost', which is usually defined narrowly as the price of the least cost alternative inputs. The rationale of the AIP regime is that through imposing such a price on spectrum users, it provides an incentive for them to reduce the use of spectrum as much as possible.

The benefit of AIP is the improvement of the efficiency and transparency (particularly in relation to public sector users) of spectrum use. The discussion document requested submissions from stakeholders on the potential need for using AIP in New Zealand and the costs and benefits that may arise.

5.4.1 Reactions to AIP

Most submitters dismissed the suggestion of introducing AIP in New Zealand, for the reason that there was no current shortage of spectrum and it would be too difficult come up with a formula for setting a resource price in all scenarios (e.g. not over-penalising services in un-congested bands) that all parties agreed with. DoC considers that AIP could be a useful method of encouraging efficiency in the future, but that there is not currently the same pressure on spectrum as in the UK.

Telecom was most positive about the suggestion, but suggested it should only be considered on a case-by-case basis in response to specific problems and not be implemented for its own sake across the whole regime. The RBA rejects the suggestion but considers AIP could be appropriate in either one of two cases: a) for public sector users only; or b) if the MRR was abolished.

These views suggest that in specific cases of congestion in particular bands, AIP could be considered alongside conversion to management rights, if a cost-benefit analysis and public consultation were conducted. Submissions suggest (and Ministry analysis concurs), however, that a full cost benefit analysis of implementing AIP could itself be difficult. The Ministry considers that management rights are likely to be more attractive in these situations.

5.4.2 Using AIP to promote technical efficiency

A limitation of applying overseas AIP regimes to New Zealand is that the current rationale and methodology of AIP has a strong emphasis on productive and technical efficiency, defined in terms of the costs of spectrum relative to other inputs and the amount of spectrum used. New Zealand's spectrum management, by contrast, has a focus on allocative and dynamic efficiency.

As noted above in relation to the objectives of spectrum management under the RLR, most submitters prefer that the Ministry aim for increased technical efficiency and encourage users to upgrade to more spectrally-efficient equipment. This suggests that AIP has the potential to be an effective tool to achieve Ministry objectives and meet the needs of spectrum users. However, stakeholders largely support the status quo of using technical planning to facilitate upgrades, rather than actively pushing users toward unnecessary investment in more spectrally efficient technology before they consider it necessary, or they face demand for better quality services in their downstream markets.

There are a number of other issues with AIP highlighted by the submissions, including:

Calculation of AIP is likely to be a highly complex and costly exercise. It may be difficult to achieve consensus on how to robustly model opportunity costs with what stakeholders regard as a resource tax. The appropriate price would also need to be recalculated, with resulting compliance costs, on an ongoing basis.

There may be fairness concerns about charges to users in the absence of clear evidence of a congestion problem, simply for the sake of improving technical efficiency. As with increased technical planning, a disproportionate impact will be felt by smaller users. This pressure is likely to be far greater where AIP imposes a resource price.

There is a risk that any 'over-pricing' leads to under-use of spectrum and the potential to adversely affect stakeholders' current business cases.

6. Conclusion and next steps

There is no need for major policy changes to the RLR as no significant concerns were raised regarding the effectiveness of the current regime. The Ministry is therefore not proposing to undertake further substantive work on reforming the RLR.

The Ministry does, however, propose to undertake the following operational and technical initiatives in response to the findings of this review.

6.1 Technical planning

6.1.1 Tighter rules

Submissions identified a number of potential congestion concerns that could be addressed with tighter rules around technical parameters of some licences. For instance, tighter rules around fixed services in bands above 1 GHz could free up spectrum for more services. The next revision of Public Information Brochure 38 – Radio Licence Engineering Rules and Information for Approved Radio Engineers and Approved Certifiers (currently underway) will address this matter.

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6.1.2 Facilitating more spectrally efficient technology

Work to facilitate the uptake of digital technologies that promote technical efficiency will continue. The Ministry is currently working on planning of changes to the licensing arrangements for land mobile radio bands to facilitate the introduction of digital systems. It will then undertake similar work in relation to the fixed analogue linking bands.

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6.1.3 Proactive forecasting

The Ministry will ensure that its future work programme includes a more systematic and pro-active approach to the forecasting of demand and usage trends in the Radio Licensing spectrum, including consideration of associated technology developments that may assist to reduce the risk of overcrowding in this spectrum. This work will take account of the differing views as to balancing technical with economic efficiency, i.e., future spectrum efficient technologies vis-à-vis lower cost legacy systems, particularly where spectrum scarcity is not an issue.

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6.2 Tools for managing congestion, incumbency, hoarding, and non-use

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6.2.1 Case by case congestion management

The Ministry proposes to continue case-by-case consideration of congestion issues and remain open-minded about potential solutions. Although there was little support for incentive pricing in general, submissions suggest it could be considered alongside management right approaches. Other approaches, such as auctioning spectrum licences in particular areas with the Crown retaining the management right, also remain as viable spectrum management options.

Whilst submitters prefer to keep competition principles separate from spectrum allocations, the concerns about access to spectrum and uncompetitive allocations via auction suggest that spectrum caps and eligibility requirements will continue to have relevance in particular cases of conversion to management rights, particularly where markets for end-uses are not well developed.

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6.2.2 Local measures

Methods such as regional management rights and/or geographical underlay and overlay have the potential to deliver services like broadband to rural areas. These methods effectively create an easement on an existing management right to allow another user to operate in areas where the rightholder has no service installed.

The Ministry proposes to consider the viability of geographically-based management rights and other potential tools, such as geographical easements, in the next review of the Radiocommunications Act, which is likely to commence in 2010/11.

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6.2.3 Operational provisions

The Ministry agrees that more work could be done to facilitate the investigation of alleged non-use or uncompetitive hoarding. The ability to cancel licences for non-use, implemented in 2008 by amendment to the Radiocommunications Regulations, has not yet been exercised. To actively seek out licences that are not in use would be time consuming and resource intensive, with the costs needing to be recovered from licensees.

Submitters generally support penalising hoarding and ensuring timeliness and certainty for parties seeking access to spectrum. The Ministry will therefore:

- free up unused spectrum when requested by setting up a process to support the ‘use-or-lose’ provisions; and
- encourage users to transfer RLR licences, particularly when they are not used.

Allowing transfers between parties is permitted by the current regulations. The ‘use-or-lose’ process, plus other measures like licence transfer options, will be promoted on the Ministry’s website.

6.3 Measuring against objectives - spectrum values

In response to submitters' concerns about evaluating spectrum management against objectives, particularly efficiency, the Ministry proposes to investigate estimating the value of particular spectrum bands with a view to benchmarking economic efficiency. Whilst there is no pressing or vital impetus for this work, submitters noted that the objectives are not currently quantitatively evaluated, and there is an opportunity to better understand the value of the spectrum.

The Ministry will explore a partnership with a university study programme. This is non-urgent work, and likely to begin as a low cost exercise in academic research to benchmark the economic value and utilisation of the spectrum.

Appendix A: List of questions

Objectives

Q1: Do you agree with these objectives? If not, how would you interpret the objective of spectrum management policy?

Problem and status quo

Q2: Do you agree with the Ministry's analysis of the problem above?

Q3: Do you think the Radio Licensing Regime is meeting the objectives discussed previously? If not, what are the problems in your view?

Q4: Are you aware of current or potential congestion problems in individual bands under the Radio Licensing Regime (including bands which are not covered by the technical study)?

Q5: Do you think that further study is needed before any change is recommended? Which bands should be prioritised for review?

Q6: Do you have any quantitative data around the cost of potential congestion (e.g. lost economic value as a result of inability to obtain licences in congested bands)?

Options

Q7: Do you think a localised approach would work to address issues concerning the Radio Licensing Regime? What do you think are its main costs and benefits?

Q8: What do you think should be the relation between competition policies in the downstream service markets and spectrum use?

Q9: What do you think are the best ways to ensure smooth transition when policy changes are made?

Status quo

Q10: Do you think the status quo is working satisfactorily?

Q11: Do you agree with the Ministry's analysis of the costs and benefits of the status quo above? If not, then please explain why.

Q12: What other benefits and costs associated with the status quo should be considered?

Q13: Do you think the following measures will improve the Radio Licensing Regime, and why?

- Devolution of licensing function
- Improved technical planning
- "Access" seeker regime
- Flexible licence conditions.

Q14: In which bands do you think these measures should apply?

Q15: What do you think the impacts of status quo or any additional measures would be on your organisation and other users?

Management rights

Q16: Do you think conversion to a Management Rights Regime will improve spectrum allocation under the Radio Licensing Regime?

Q17: Which bands should be considered for conversion to a Management Rights Regime?

Q18: Do you agree with the Ministry's analysis of the costs and benefits associated with conversion of certain bands to the Management Rights Regime? If not, then please explain why.

Q19: What other costs and benefits associated with conversion of certain bands to the Management Rights Regime should be considered?

Q20: What do you think the impacts would be on your organisation and other users if administrative licences are converted to management rights?

Administrative incentive pricing

Q21: Do you think Administrative Incentive Pricing will improve spectrum allocation under the Radio Licensing Regime?

Q22: Which bands should be subjected to Administrative Pricing?

Q23: Do you agree with the Ministry's analysis of the costs and benefits associated with AIP? If not, then please explain why.

Q24: What other costs and benefits associated with AIP should be considered?

Q25: What do you think the impacts of AIP would be on your organisation and other users?

Conclusions

Q26: Do you agree with the Ministry's assessment of the Radio Licensing Regime?

Q27: Are there any other issues that you think the Ministry should consider?

Q28: Is there any other option that might improve spectrum allocation under the Radio Licensing Regime?