OFFICE OF THE MINISTER OF BROADCASTING
OFFICE OF THE ASSOCIATE MINISTER OF COMMUNICATIONS

The Chair
CABINET ECONOMIC DEVELOPMENT COMMITTEE

DIGITAL TERRESTRIAL TELEVISION - SPECTRUM ALLOCATION (PAPER C)

PROPOSAL

1 This paper reports on a favoured option for allocating spectrum suitable for digital terrestrial television (DTT).

EXECUTIVE SUMMARY

2 In December 2002 Cabinet agreed on objectives to guide future digital TV policy development and directed departments to report to the Committee on various issues [CAB Min (02) 33/4 refers]. This paper considers spectrum allocation for digital terrestrial television (DTT).

3 An essential pre-condition for the establishment of a New Zealand DTT platform is the availability of suitable radio frequency spectrum. Government decisions on an allocation framework may facilitate DTT by enabling broadcasters and new entrants to make appropriate and timely investment decisions.

4 It is proposed that holders of spectrum licences be permitted to convert existing analogue licences to digital licences, subject to existing valuation policies and technical compatibility. A digital licence would be capable of broadcasting a DTT "multiplex" of up to five or more digital services. Under this policy, TVNZ could immediately seek to convert its unused analogue UHF network to a DTT multiplex.

5 It is proposed that the Crown retain two nation-wide sets of interleaved DTT spectrum licences, which could be used to simulcast existing analogue services in digital format, or for public broadcasting purposes. Terms of access to reserved spectrum will be the subject of further work. Potential further DTT capacity exists in the non-commercial reserve block and the Māori Television Service can create licences suitable for DTT from within its own UHF management right as it sees fit.

6 The paper seeks agreement in principle to allocation by auction of four further nation-wide sets of “interleaved” DTT spectrum licences; and of management rights in respect of the unused band of frequencies (502-518 MHz, also termed RF channels 25 and 26) adjacent to the spectrum presently licensed for UHF TV. Negotiations with existing licensees to adjust technical protection levels of some existing licences are needed before full sets of interleaved licences can be created.

7 The paper proposes that any auction of spectrum rights be held following sufficient demand being demonstrated, subject to Cabinet reconfirming the agreed allocation option, and that an auction should be tentatively scheduled for third quarter 2004. DTT spectrum licences will be made available on a temporary basis for technical and commercial testing of DTT prior to a long-term allocation by auction.

BACKGROUND

8 In December 2002 Cabinet agreed on objectives to guide future digital TV policy development and directed departments to report to the Committee by 30 June 2003 (delayed to allow further consultation with industry) on various issues [CAB Min (02) 33/4 refers]. This paper considers spectrum allocation for DTT.

9 Broadly speaking, four modes of transmission are able to provide digital TV: satellite, terrestrial, cable, and network or Internet connections. Implementation of digital cable or network and Internet TV does not require specific government intervention. By contrast, implementation of DTT and continuation of satellite TV requires the Crown to allocate and manage radio frequency spectrum appropriately.

10 In all forms of digital TV, television programmes are transmitted to the home in the form of binary digits or "bits". In DTT, the bit streams of a number of different television programmes (potentially up to five or more) can be brought together into a single transmission, or multiplex, and transmitted in the same radio frequency bandwidth required for a single analogue terrestrial TV programme. The digital signals are then received by a consumer antenna, converted to analogue format by a set top box, and viewed on a television receiver. Alternatively, the digital signals could be viewed directly from the antenna on an integrated digital television receiver.

11 Cabinet [CAB Min (02) 33/4 refers] agreed that the development of digital TV does not, of itself, require the revision of government's objectives of ensuring that radio spectrum allocation policy maximises the value of spectrum to New Zealand society, or revision of the broadcasting content objectives agreed by Cabinet in July 2000 [CAB Min (00) M 22 15A and C refers], but that digital TV has the potential to assist the achievement of these government objectives. Cabinet also agreed that broadcasters and viewers should be free to choose the platform (eg satellite, terrestrial or cable) by which digital TV is provided, based on factors such as cost, content and reliability.

12 An essential pre-condition for the establishment of a New Zealand DTT platform is the availability of suitable radio frequency spectrum. Government decisions on an allocation framework may facilitate DTT by enabling broadcasters and new entrants to make appropriate and timely investment decisions.

13 This paper considers three questions regarding radio spectrum for DTT, being:

a What radio spectrum is available for DTT?

b How should spectrum for DTT be allocated?

c When should spectrum for DTT be allocated?

What radio spectrum is available for DTT?

14 DTT is generally implemented in the VHF and UHF bands used for analogue television. In New Zealand the VHF bands are heavily used for TVOne, TV2, TV3 and TV4, so any New Zealand DTT platform is likely to be implemented in the UHF TV bands. Existing licences in the UHF bands are generally separated by at least one unused RF channel. Licences suitable for DTT can be inserted (interleaved) in these unused RF channels. This is consistent with practices in overseas markets, although Australia uses both UHF and VHF TV bands for digital services.

15 The technical characteristics of interleaved licences are limited in some areas[1], by the presence of existing licences in adjacent geographic areas. These existing licences were designed for analogue services and provide a greater degree of technical protection than is necessary for present or likely future services. Modification of these technical protection levels requires the agreement of the relevant licence holders (typically Sky, TVNZ, TAB and Prime Television). The Ministry of Economic Development has commenced initial discussions with Sky on this issue.

16 It is desirable to maximise the coverage of future interleaved digital licences and so this paper seeks agreement for MED to negotiate changes to as many existing licences as possible. In the event that negotiations are unsuccessful, changes could be considered in 2005 when, in accordance with government's recently announced policy on expiry of rights, detailed work is undertaken on provision of replacement UHF licences from 2010.

17 In addition to interleaved DTT licences, the frequency range 502-518 MHz, at the immediate lower edge of the present UHF television bands, is unused and otherwise available. This spectrum can support two RF channels for broadcasting but could also be used for telecommunications purposes or a mixture of uses.

18 Holders of analogue VHF or UHF TV licences may wish to operate DTT services on the spectrum covered by these licences, now or in the future. The analogue licence would need to be replaced with a DTT licence and any analogue service would be switched-off. Whilst analogue switch-off seems unlikely in the short term, TVNZ could immediately seek to convert its unused analogue UHF network to a DTT multiplex use and Sky could seek to replace one or more of its UHF services with a DTT multiplex. CanWest might eventually wish to replace TV4 with a DTT multiplex.

19 Conversion is consistent with the principle of technological neutrality, which underlies government's radio spectrum policies. This paper seeks agreement in principle to broadcasters being able to convert existing analogue licences to digital licences, subject to technical compatibility with existing and planned licences. Government's existing policies would apply to any change, so that if the digital licence had a larger coverage area than an analogue licence, the licensee would pay an assessed charge for the added population.

20 The management right to be provided to the Māori Television Service (MTS) places it in a unique position vis-à-vis other broadcasters who all hold spectrum licences within a Crown-owned management right. MTS could engineer and allocate analogue and/or digital spectrum licences to itself and potentially even to third parties. MTS could also lease space on a DTT multiplex to other broadcasters, providing this was within the ambit of the Māori Television Service Act.

How should spectrum for DTT be allocated?

21 Prior to considering allocation to commercial use, it is necessary to consider if spectrum is available for promotion of Māori language and culture and government's non-commercial broadcasting objectives.

[1] particularly Wellington and Southland, and to a lesser extent Christchurch and Palmerston North.

22 The Crown has an obligation under the Treaty of Waitangi to promote Māori language and culture. For this reason, the Māori Television Service Act provides for the transfer of a 10 year management right over UHF channels 35-38 (block 3) to MTS. An important prior question to consider when addressing DTT spectrum allocation is whether an additional reservation of spectrum would further enhance the Government's ability to meet its Treaty obligations.

23 Whilst MTS has a clear capability to operate both digital and analogue services, other Māori interests may wish to operate further television services in due course. The digital format inherently allows a greater number of programmes to be broadcast. Further Māori content could be provided within any DTT multiplex, be it operated by MTS, from the Crown's non-commercial reservation, or within a commercial platform. Reservation of additional spectrum for Māori at this time is not likely to further enhance the Government's ability to meet its Treaty obligations.

24 Government has a longstanding reservation over UHF channels 39-42 (block 4) for non-commercial purposes and this reservation could allow for interleaved DTT licences in most areas of New Zealand. The viability, however, of non-commercial television is marginal, even for analogue transmission, and a stand-alone non-commercial multiplex seems unlikely. It seems more likely that non-commercial programming would be accommodated within a multiplex operated by other parties.

25 Any allocation of spectrum to facilitate DTT provides a logical point at which to consider whether the current practice of allocating spectrum licences in TV bands should continue, or whether further benefits could be obtained from allocation of management rights as an alternative.

Management Rights or Spectrum Licences

26 Management rights give the holder the exclusive right to determine the nationwide use of the band concerned and to create and allocate licences within it, while spectrum licences are restricted to specific locations and technical parameters. The management rights currently used for UHF TV were the first rights created under the Radiocommunications Act 1989. As such, they represented a groundbreaking step in spectrum management which has been followed to various degrees by other major countries. None the less the government of the day adopted a cautious approach and decided to retain the management rights. This approach has been supported by the broadcasting industry because of competition concerns if the private band manager turned out to be a competitor.

27 The present UHF TV management rights could be allocated as seven management rights, each of 32 MHz (blocks 1-2 & 5-9). Allocation of management rights would allow broadcasters and, subsequently, viewers to decide when and if to adopt DTT based on factors such as cost, content and reliability. Private management rights would enable industry to deal with timing of DTT rollout, technical issues and frequency reuse. Allocation of management rights without restrictions on using the band could also result in the band manager deciding not to launch DTT at all and use the band for other purposes, subject to the rights of existing licensees. Furthermore, at expiry of rights in 2010, a private band manager might not renew incumbent analogue licences. The Crown's rights at expiry policy is designed to give incumbents the option to rollover existing rights in most cases.

28 The Crown could, alternatively, retain the UHF TV management rights and allocate spectrum licences. Preliminary engineering work suggests that at least six interleaved UHF digital spectrum licences (and hence six multiplexes) are possible in most areas in the existing commercial UHF TV management right blocks. Technical parameters of current analogue licences, however, restrict the creation of digital interleaved licences in some areas (discussed above).

29 Allocation of spectrum licences is consistent with current practice with respect to broadcasting bands and gives the Crown greater control over the timing of the launch of digital TV. Retention may assist government to achieve its broadcasting policy objectives, and is favoured by broadcasters who prefer the Crown to allocate spectrum licences as a "neutral" band manager. Despite the advantages of allocating management rights, this paper recommends, on balance, that the present practice of retaining management rights for the existing commercial UHF TV bands be continued and the Crown should instead allocate interleaved spectrum licences. This is expected to the main mechanism for introduction of digital TV.

30 It is noted that the DTT standards contain flexibility to operate digital information type services, rather than conventional television. This flexibility is seen as desirable as one of the key characteristics of digital TV is convergence of broadcasting and telecommunications services.

31 If the currently unused band 502-518 MHz (corresponding to RF channels 25 & 26, immediately below the current UHF TV band) is to be utilised, the opportunity exists to allocate management rights with respect to this spectrum. To date government has preferred to retain the management rights for television and radio broadcast bands (except for MTS), although it generally allocates management rights with respect to spectrum suitable for telecommunications.

32 Any use of 502-518 MHz will need to avoid interference to existing uses in the adjacent band 494-502 MHz. Further, most broadcasting services use a four RF channel block to achieve nation-wide coverage. With innovative planning, however, the 16 MHz block of spectrum between 502-518 MHz could support broadcasting, telecommunications or a convergence of such uses. This paper proposes that the frequency band 502-518 MHz be allocated as two management rights of 8 MHz.

Allocation Options for Spectrum Rights

33 The next question to be determined is the Crown's preferred allocation model for interleaved spectrum licences and management rights for 502-518 MHz. In effect this determines the extent of new entrants, and what, if any, special provisions might be available to existing broadcasters. Three options are considered.

Option 1: Non competitive allocation of spectrum rights

34 Under this option, spectrum rights would be granted solely to existing broadcasters on a non-competitive basis, subject to various conditions, such as implementation of digital coverage and analogue licences being relinquished upon analogue switch-off.

Option 2: Competitive allocation of spectrum rights

35 This option involves a competitive allocation by auction of spectrum rights.

Option 3: Part competitive allocation with reservation of spectrum rights

36 This is similar to option two above, but reduces the spectrum allocated by auction to enable a reservation to be kept for either simulcasting of existing broadcasts, and/or for "public service broadcasting".

Analysis of Options

37 Non-competitive allocation (option one) removes the uncertainty of an auction for existing broadcasters. In return for preferential access to spectrum, government could impose roll-out requirements on broadcasters to ensure that DTT is successfully launched, which might result in a DTT platform being established earlier than might be the case under other options. These requirements, if agreed, could ensure that digital transmissions commence, but would not facilitate new entrants in the market. In time, the imposed requirements may prove impractical or burdensome to broadcasters and government may be subject to pressure for their removal.

38 Option one represents a departure from existing allocation practice by strongly preferring incumbents. It assumes that the best way to establish a DTT platform is to rely on existing broadcasters and protect them from competition. There is no reason to believe broadcasters could not obtain spectrum at auction, or that the cost of doing so would be prohibitive. It is commonly believed that DTT viability, at least initially, may be marginal. It follows that demand for spectrum will be weak and prices low. This option would, unless special provision was made, prevent organisations such as BCL from acquiring spectrum rights to offer digital transmission services to programme providers. It is noted that Sky UHF, Prime, TV4 and some other UHF services have emerged following competitive allocations or private commercial transactions for spectrum.

39 This option does not fit easily with government's previous decisions that broadcasters and viewers should be free to choose the platform (eg satellite, terrestrial or cable) by which digital TV is provided, based on factors such as cost, content and reliability. This implies a more open approach than a negotiation of a set of coverage obligations before spectrum is provided. Option one most closely resembles that used in Australia, but experience there to date suggests low consumer uptake is likely to prevail with this model. By contrast, the United Kingdom has adopted a multichannel approach, which has achieved higher consumer uptake. Most New Zealand broadcasters generally favour option one, as it provides them with the most certainty of market access and protection. Potential new entrants such as telecommunications companies, along with Sky, favour a competitive allocation model.

40 Competitive allocation, option two, is consistent with the existing practice of allocating spectrum. It is intended to maximise value of spectrum rights to New Zealand as a whole by ensuring spectrum rights are held by those who value them the most. All existing commercial UHF TV analogue spectrum licences were allocated through a competitive process.

41 This option avoids the government setting or negotiating coverage obligations without clear knowledge of spectrum value or market issues. It also allows transmission providers and potential new entrants to acquire spectrum on a commercial basis. Concerns about the potential for an existing broadcaster being "locked out" of a digital future should be seen in the context of both the Commerce

Act, the potential to convert existing licences for digital use, and the possibility of setting spectrum acquisition caps at any future auction.

42 Option three involves a competitive allocation, but some spectrum is reserved to assist particular government objectives. Any such policy would need to define who could access the reserved spectrum, for what purposes and on what basis.

43 Notwithstanding the reasonable probability that broadcasters would acquire spectrum at auction under option two, option three creates a further safeguard by reserving spectrum to guarantee spectrum availability for particular purposes. Two possible purposes have been identified: simulcasting existing analogue television programmes and public broadcasting use. A reservation gives a "backstop" option and ensures that government has the capability to address issues of access to spectrum should they arise during DTT planning.

44 One use of any reservation could be for simulcasting existing programmes. Whilst simply simulcasting is not likely to fully address the needs of broadcasters, or indeed viewers, for innovative digital services, it would give a reasonable capability to any broadcaster who does not acquire spectrum competitively, thereby providing a guaranteed transition path to digital. If the reservation was utilised for simulcasting of commercial programmes, then a charge should apply for use of the reservation. Two multiplexes are sufficient to simulcast current free-to-air analogue terrestrial programmes, and may be adequate to include Sky analogue UHF services. Fewer multiplexes should in reality be necessary, as broadcasters are likely to compete at auction to secure a digital future.

45 Broadcasters do not favour such a reservation simply for simulcasting, as the operation of a shared multiplex requires them to work closely with their competitors. Accordingly, broadcasters would have an incentive to purchase their own DTT spectrum at any auction to gain flexibility and direct ownership. Terms of access to reserved spectrum will be of interest to broadcasters when considering whether to compete at auction, and will be subject to further work by officials.

46 A further purpose of any reservation could be to promote public broadcasting. This would most likely be by allowing TVNZ preferential access for public broadcasting. Officials consider that a public broadcasting reservation is not likely to be necessary. TVNZ could simply convert its existing unused analogue UHF licences to digital whilst MTS already has a digital option. TVNZ has demonstrated it is able to use its strong position in the market to access commercial platforms (ie Sky satellite) and would likely have an even stronger position in terrestrial services. If a reservation were not provided, interleaved licences could be engineered in the existing non-commercial block (subject to restrictions in some areas). In addition, Government could fund digital content on commercial networks using the existing NZ on Air funding model or increase direct funding to TVNZ. These options are more transparent than direct allocation of spectrum without knowledge of its market value.

47 A question arises as to whether one or both management rights for 502-518 MHz should form part of any reservation. The innovative planning necessary to use these management rights suggests that industry interests, rather than the government, are best placed to plan and invest in such ventures. Further, almost all UHF TV spectrum will remain under Crown management (256 MHz c.f. 2 x 8 MHz), and this spectrum could be applied in future to similar innovative uses as 502-518 MHz.

48 This paper seeks the Committee's agreement in principle to option three, a commercial allocation, alongside a reservation of two nationwide sets of spectrum licences suitable for DTT, subject to reconfirmation of the allocation options prior to an auction being held. It is proposed that decisions on exact use of reserved spectrum, and any associated conditions, be also made prior to any auction.

When should spectrum for DTT be allocated?

49 Broadcasters, in particular, have suggested that an allocation of spectrum for DTT in the near future would be premature. If an auction of spectrum for DTT was to be held now, moderate demand is likely for spectrum suitable for DTT from existing broadcasters, as they cannot afford not to secure a digital future. Telecommunications companies may also be interested in the spectrum. If spectrum is allocated close to the time it will be implemented, the risk of stranded investment or a windfall to auction participants is reduced.

50 It is proposed to schedule an auction of DTT spectrum during the third quarter 2004, subject to final Cabinet agreement on allocation options and sufficient demand for spectrum being demonstrated, such as a proposal to implement a nation-wide DTT service. The spectrum licences would be auctioned for the period 2004-2010 (when the current Crown-owned management right expires) and for the renewal period, 2010-2030. In the meantime, technical and commercial testing could be accommodated through conversion of licences or temporary DTT licences issued on a first-come-first served basis.

CONSULTATION

51 This paper has been prepared by MED, in consultation with Te Puni Kokiri, the Ministry for Culture and Heritage and the Treasury. A draft of this paper was provided to CCMAU for its information. Details of consultation with industry are set out in the paper entitled “Digital Television: Overview Paper”.

FISCAL IMPLICATIONS

52 The financial implications of allocation option one are dependent on whether broadcasters are charged for preferential access to spectrum, a policy which broadcasters oppose. Option two is least costly and should result in net positive government cashflow. Option three falls somewhere between option one and two and includes costs of administering reserved spectrum.

53 The price set at any auction for each management right over unused spectrum between 502 and 518 MHz is likely to be greater than for an interleaved spectrum licence, due to the potential for diversity of use of this spectrum.

HUMAN RIGHTS AND LEGISLATIVE IMPLICATIONS

54 None.

REGULATORY IMPACT AND COMPLIANCE COST STATEMENT

55 Not required.

PUBLICITY

56 It is proposed that the Minister of Broadcasting and Associate Minister of

Communications be invited to announce decisions on spectrum allocation for DTT and to arrange for this paper to be made publicly available.

RECOMMENDATIONS

57 It is recommended that the Committee:

1 **Note** that in December 2002 Cabinet directed officials to report to the Committee on a favoured option for allocating spectrum suitable for digital terrestrial television (DTT) [CAB Min (02) 33/4 refers].

2 **Note** that a pre-condition to the establishment of DTT in New Zealand is the availability of suitable radio frequency spectrum, through the creation of additional licences suitable for DTT or conversion of licences suitable for analogue transmission.

What radio spectrum is available for DTT?

3 **Agree** that holders of spectrum licences be permitted to convert existing analogue licences to digital licences suitable for DTT by applying to the Ministry of Economic Development, subject to existing valuation policies and technical compatibility.

4 **Note** that Television New Zealand owns a nation-wide set of presently unused UHF licences which were engineered for analogue services, but could be converted to allow digital transmission should that be required.

5 **Note** that the Māori Television Service will be provided with a management right and that this will enable it to implement licences for analogue and digital services as and when it sees fit.

6 **Agree** that an additional reservation of spectrum suitable for DTT for the promotion of Māori language and culture would not significantly enhance the Crown's ability to meet its Treaty of Waitangi obligations.

How should spectrum for DTT be allocated?

7 **Note** that additional licences suitable for DTT can be created using spectrum between analogue licences in the commercial and non-commercial reserve UHF TV blocks (interleaved) and through the allocation of two currently unused channel bands between 502 and 518 MHz.

8 **Note** that interleaved digital licences are presently technically limited by the parameters of some existing licences, which were originally created with greater protection to the analogue services than has proved to be necessary.

9 **Agree** that the Ministry of Economic Development should negotiate changes to analogue licences on suitable terms to maximise technical capability of interleaved DTT licences.

10 **Note** that the presently unused spectrum between 502 and 518 MHz is capable of several uses, including broadcasting (as TV channels 25 and 26), telecommunications use, or a convergence of such uses.

11 **Agree** that spectrum between 502 MHz and 518 MHz should be allocated as two separate management rights of 8 MHz each.

Allocation Options

12 **Note** three spectrum allocation options for interleaved DTT spectrum licences and management rights for 502-518 MHz that have been considered, being:

12.1 Option 1: Direct allocation of spectrum rights to existing broadcasters;

12.2 Option 2: Competitive allocation of rights by auction;

12.3 Option 3: Competitive allocation of rights with a reservation of spectrum for simulcasting and/or public broadcasting.

13 **Note** that option 3 allows existing and new broadcasters to enter the DTT market on an equal basis, whilst ensuring that continuity for existing broadcasters can be provided if necessary.

14 **Agree** in principle to:

14.1 a reservation of two nation-wide sets of spectrum licences suitable for DTT in the UHF bands (i.e. sufficient spectrum for up to 10 or more programmes);

14.2 competitive allocation by auction of four nation-wide sets of interleaved spectrum licences suitable for DTT in the UHF bands presently used for commercial services, and of two 8 MHz management rights in respect of spectrum between 502-518 MHz.

When should additional spectrum for DTT be allocated?

15 **Agree** that an auction of DTT spectrum be held only following sufficient demand being demonstrated and subject to government reconfirming the agreed allocation option, and that an auction should be tentatively scheduled for third quarter 2004.

16 **Direct** the Ministry of Economic Development to report to EDC prior to any auction being held, seeking confirmation of the preferred allocation option and of policies for utilisation of reserved spectrum.

17 **Agree** that DTT spectrum licences be made available on a temporary basis for technical and commercial testing of DTT prior to any auction being held.

18 **Invite** the Minister of Broadcasting and Associate Minister of Communications to announce decisions on spectrum allocation for DTT and to arrange for a copy of this paper to be made publicly available.

Steve Maharey
Minister of Broadcasting

Hon David Cunliffe
Associate Minister of Communications