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**Radiocommunications Assignment and Licensing Instruction**

**400 MHz PLAN**

# RADIOCOMMUNICATIONS ASSIGNMENT AND LICENSING INSTRUCTIONS

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The Australian Communications and Media Authority (ACMA) advise that these instructions reflect the current policies of the ACMA.

Prospective applicants for licences should take all necessary steps to ensure that they have access to appropriate technical and other specialist advice independently of ACMA concerning their applications, the operation of radiocommunications equipment and services, and any other matters relevant to the operation of transmitters and services under the licences in question.

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Suggestions for improvements to Radiocommunications Assignment and Licensing Instructions may be addressed to The Manager, Spectrum Engineering, ACMA at PO Box 78, Belconnen, ACT, 2616, or by e-mail to [freqplan@acma.gov.au](mailto:freqplan@acma.gov.au). It would be appreciated if notification to ACMA of any inaccuracy or ambiguity found be made without delay in order that the matter may be investigated and appropriate action taken.

## Amendment History

| Date          | Comments  |
|---------------|---|
| 1995          | Adjustment of segment boundaries and addition of allocation arrangements for single frequency narrowband services and 400 MHz wideband fixed point-to-point and point-to-multipoint services in rural areas.  |
| 1997          | The allocations for a number of single frequency segments were changed and segment G was reduced in bandwidth by approximately 600 kHz. The nominal emission bandwidth for the wideband rural fixed point-to-multipoint service was increased to 1.82 MHz.  |
| 2000          | Clarification of support for low and high power mobile applications within segments allocated to the single frequency land mobile service.  |
| 2002          | This release provides new opportunities for point-to-multipoint applications in segments allocated for land mobile use. The Plan was also restructured to more appropriately present policy and historical information.   |
| February 2011 | In response to a review of the 400 MHz band a wide range of changes were introduced including the adoption of 12.5 kHz channels throughout the narrowband channel raster (with advice on channel splitting for 6.25 kHz if required), realignment of segment boundaries and restructure of 450–470 MHz to accommodate a 10 MHz duplex frequency split. Segments were set aside to be used exclusively for federal, state and territory government purposes. The use of trunking was encouraged in all segments allocated for the land mobile service. The frequency range 420–430 MHz was added to the scope of the 400 MHz Plan. |
| May 2012      | Updated to reflect the revocation of the 500 MHz spectrum licence designation notice and that these segments reverted to apparatus licensing throughout Australia. The segments used for rail purposes were also given greater visibility and channels specifically for area wide applications were added.  |
| January 2015  | Updated to identify further channels set aside for use by the rail industry and to reflect changes to the assignment priority of spectrum utilised by the point-to-multipoint services. Also amended to better align segment boundaries to maximise the number of available channels.   |

# 400 MHz Plan

## 1.0 Purpose

The purpose of this Radiocommunications Assignment and Licensing Instruction (RALI) is to codify planning arrangements for radiocommunication services in the two bands 403–430 MHz and 450–520 MHz (known collectively as the 400 MHz band) by way of issuing the 400 MHz Plan. The Plan advises the service allocations in the two bands, specifies the segment frequency limits applicable to these allocations, and the channelling arrangements within these segments.

The information in this RALI reflects the Australian Communications and Media Authority's statement of current policy in relation to planning arrangements for radiocommunications services in the 400 MHz band. In making decisions, accredited persons and Australian Communications and Media Authority (ACMA) officers should take all relevant factors into account and decide each case on its merits. If an issue related to this document appears to fall outside the enunciated policy, please consult the Manager, Spectrum Engineering Section, PO Box 78, Belconnen, ACT, 2616.

## 2.0 Spectrum arrangements

Allocation and channelling arrangements for the 400 MHz band are contained at Appendix A of this Plan. Service allocations and channelling arrangements for narrowband services throughout Australia are detailed in Table 1 of the Appendix and illustrated in Figure 1 of the Appendix. Channelling arrangements for wideband fixed point-to-point and point-to-multipoint services that are provided for in rural Australia are detailed in Tables 2 and 3 of the Appendix and illustrated in Figures 2 and 3 of the Appendix respectively. Arrangements for the radiolocation and amateur services are outside of the scope of this plan.

### 2.1 Narrowband services

The 400 MHz Plan provides for the operation of narrowband land mobile services (single/two frequency with 6.25/12.5/25 kHz channelling and two frequency trunked with 6.25/12.5/25 kHz channelling) and fixed services (single frequency with 12.5/25 kHz channelling, two frequency point-to-point with 12.5/25 kHz channelling and two frequency point-to-multipoint with 12.5/25 kHz channelling).

Narrowband services are assigned in accordance with this Plan.

High power land mobile<sup>1</sup> assignments using 25 kHz channels for a single communications circuit (e.g. for a single voice channel) are prohibited within high density areas (HDAs) and medium density areas (MDAs) and the area extending 100 km out from the HDA or MDA boundary.<sup>2</sup> The use of a 25 kHz channel for a single communications circuit will be supported 100 km or more outside of HDAs and MDAs. The use of channels greater than 12.5 kHz bandwidth within 100 km of HDAs and MDAs is permitted only for systems carrying two or more circuits through a 25 kHz channel, i.e. systems that achieve spectrum efficiencies equal to or better than one communications channel per 12.5 kHz will be permitted in any area.

Low power land mobile<sup>3</sup> assignments using 25 kHz channels for a single communications circuit (e.g. for a single voice channel) are prohibited within high density areas (HDAs) and medium density areas (MDAs). The use of a 25 kHz channel for a single communications circuit will be supported outside of HDAs and MDAs. The use of channels greater than 12.5 kHz bandwidth within HDAs and MDAs is permitted only for systems carrying two or more circuits through a 25 kHz channel, i.e. systems that achieve spectrum efficiencies equal to or better than one communications channel per 12.5 kHz will be permitted in any area.

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<sup>1</sup> For the land mobile service the term high power is defined as assignments using more than 8.3 Watts EIRP and is typically 83 Watts.

<sup>2</sup> These areas are defined in the Apparatus Licence Fee Schedule <http://www.acma.gov.au/theACMA/About/Making-payments/Apparatus-licence-fees/apparatus-licence-fees-acma>

<sup>3</sup> For the land mobile service the term low power is defined as assignments using 8.3 Watts EIRP or less.

Stations in the fixed service (point-to-multipoint) are limited to segments allocated to the fixed service (point-to-multipoint) and the top 1.5 MHz of segments NN/SS (i.e. Channels 201 to 320 of segments NN and SS). Segments allocated for the land mobile service may only be used by point-to-multipoint services if they cannot be accommodated in the above mentioned segments. Segments allocated exclusively for the land mobile service (trunked) are not to be used for the point-to-multipoint service. The criteria specified in this Plan for the land mobile service apply to the use of these segments by stations in the fixed service (point-to-multipoint). When fixed service (point-to-multipoint) systems are assigned in 400 MHz land mobile segments, the assignment process shall be as prescribed in RALI LM8. The use of 25 kHz channels for the fixed service (point-to-multipoint) is supported in all density areas.

Assignments for 6.25 kHz bandwidth may be made within 12.5 kHz channels, by offsetting from the nominal 12.5 kHz channel centre by 3.125 kHz. Assignments to 6.25 kHz systems should be made adjacent to any existing 6.25 kHz assignments in the same area wherever possible.

For the land mobile service, two 12.5 kHz channels may be aggregated if required. In HDAs and MDAs, the aggregation scheme is channels 1 and 2, 3 and 4, et cetera. In other areas this is also the preferred method, however when assignments are made to expand existing 25 kHz systems a 25 kHz assignment may be made on the channel raster used for the existing system.

Segments E and M are allocated exclusively to the land mobile service (trunked). Land mobile trunking systems may also be assigned in all other segments allocated to the land mobile service. The principles detailed in RALI LM3 still apply.

Where the land mobile service allocation permits single frequency operation, the allocation is intended primarily to support single frequency low power applications. Assignments may be made to single frequency high power land mobile applications in low density and remote density areas on sites where the proposed licensee is the only licensee holding assignments in the 400 MHz band, i.e. use of high power single frequency applications is not generally permitted on communal sites where more than one licensee holds assignments in the 400 MHz band.

Table 4 of Appendix 1 lists the channels that shall be used for single frequency area wide operation. Table 5 of Appendix 1 lists the channels that shall be used for two frequency area wide operation. Channels are nominally 12.5 kHz wide but may be aggregated to form 25 kHz channels as per the tables. Channels within segments used for government purposes may also be used for area wide services.

New assignments not meeting the planning arrangements in this Plan but required to extend existing services may continue to be made in areas outside of high and medium density areas. In high and medium density areas, non-compliant assignments may be allowed for reasons of interoperability on a case-by-case basis, assessed by the Manager, Spectrum Engineering Section. Short term use pending migration to compliant systems is considered reasonable justification for such assignments.

## **2.2 Wideband rural services**

The 400 MHz Plan provides for the operation, in rural parts of Australia, of the wideband fixed (point to point) service with emission bandwidths between 150 and 750 kHz in parts of the 403–420 MHz band, and the wideband (point-to-multipoint) service with a nominal emission bandwidth of 1.82 MHz in parts of the 501–520 MHz band.

Wideband fixed services should be assigned in accordance with the channelling arrangements in this Plan.

## **3.0 Transition arrangements**

Transition arrangements are provided in Appendix B.

## **RALI Authorisation**

Approved 28/01/2015

**Mark Arkell**

Manager

Spectrum Engineering Section

Spectrum Planning and Engineering Branch

Communications Infrastructure Division

Australian Communications and Media Authority

## Appendix A: Allocation and channelling arrangements

**Table 1:** Service allocations and channelling arrangements for narrowband services in the bands 403–430 MHz and 450–520 MHz

**Figure 1:** 400 MHz narrowband services diagram

**Table 2:** Channelling arrangements for the 400 MHz wideband fixed point-to-point services

**Figure 2:** 400 MHz wideband fixed point-to-point service diagram

**Table 3:** Channelling arrangements for the 400 MHz wideband fixed point-to-multipoint service

**Figure 3:** 400 MHz wideband fixed point-multipoint service diagram

**Table 4:** Channels for single frequency area wide assignments

**Table 1: Service allocations and channelling arrangements for narrowband services in the bands 403–430 MHz and 450–520 MHz, Nov 2014**

| Segment | Service allocation  | Segment frequency limits (MHz) | Paired segment | Channel bandwidth (kHz) | Channel centre frequency formula | Range of integer values for variable 'n' | First channel/last channel centre frequency |
|---------|---|--------------------------------|----------------|-------------------------|----------------------------------|--|---|
| A       | Land mobile service (two frequency, base receive) (see note 7)        | 403.0000<br>403.98125          | I              | 12.5                    | 403.0125 + n (0.0125)            | 1 to 77                                  | 403.0250<br>403.9750                        |
| B       | Fixed point-to-point (two frequency)                                  | 403.98125<br>405.01875         | J              | 12.5                    | 403.98125 + n (0.0125)           | 1 to 82                                  | 403.99375<br>405.00625                      |
| C       | Land mobile service (two frequency, base receive) (see note 7)        | 405.01875<br>406.0000          | K              | 12.5                    | 405.0125 + n (0.0125)            | 1 to 78                                  | 405.0250<br>405.98750                       |
| D       | Mobile satellite service  | 406.0000<br>406.1000           | -              | -                       | -                                | -  | -   |
| E       | Land mobile service (trunked, base receive) (see note 10)             | 406.1000<br>408.64375          | M              | 12.5                    | 406.1125 + n (0.0125)            | 1 to 202                                 | 406.1250<br>408.6375                        |
| F       | Land mobile service (two frequency, base receive) (see notes 7 and 8) | 408.64375<br>410.54375         | N              | 12.5                    | 408.6375 + n (0.0125)            | 1 to 152                                 | 408.6500<br>410.5375                        |
| G       | Land mobile + fixed services (single frequency) (see note 1)          | 410.54375<br>410.96875         | -              | 12.5                    | 410.5375 + n (0.0125)            | 1 to 34                                  | 410.5500<br>410.9625                        |
| H       | Land mobile service (single frequency) (see note 1)                   | 410.96875<br>412.46875         | -              | 12.5                    | 410.9625 + n (0.0125)            | 1 to 120                                 | 410.975<br>412.4625                         |
| I       | Land mobile service (two frequency, base transmit) (see note 7)       | 412.46875<br>413.43125         | A              | 12.5                    | 412.4625 + n (0.0125)            | 1 to 77                                  | 412.4750<br>413.4250                        |



|   |  |                        |   |                      |                           |          |                        |
|---|--|------------------------|---|----------------------|---------------------------|----------|------------------------|
| J | Fixed point-to-point<br>(two frequency)                                      | 413.43125<br>414.46875 | B | 12.5                 | 413.43125 + n<br>(0.0125) | 1 to 82  | 413.44375<br>414.45625 |
| K | Land mobile service<br>(two frequency, base transmit)<br>(see note 7)        | 414.46875<br>415.44375 | C | 12.5                 | 414.4625 + n (0.0125)     | 1 to 78  | 414.4750<br>415.4375   |
| L | Land mobile service<br>(single frequency) (see note 1)                       | 415.44375<br>415.56875 | - | 12.5                 | 415.4375 + n (0.0125)     | 1 to 10  | 415.4500<br>415.5625   |
| M | Land mobile service<br>(trunked, base transmit) (see<br>note 10)             | 415.56875<br>418.09375 | E | 12.5                 | 415.5625 + n (0.0125)     | 1 to 202 | 415.5750<br>418.0875   |
| N | Land mobile service<br>(two frequency, base transmit)<br>(see notes 7 and 8) | 418.09375<br>420.0000  | F | 12.5                 | 418.0875 + n (0.0125)     | 1 to 152 | 418.1000<br>419.9875   |
| O | Land mobile service<br>(see note 7)  | 420.0000<br>430.0000   | - | -                    | -                         | -        | -                      |
| P | Land mobile + fixed services<br>(single frequency)<br>(see notes 1 and 8)    | 450.0000<br>450.4875   | - | 12.5                 | 450.0125 + n (0.0125)     | 1 to 37  | 450.0250<br>450.4750   |
| Q | Fixed point-to-point<br>(two frequency)                                      | 450.4875<br>451.5125   | U | 12.5                 | 450.48125 + n<br>(0.0125) | 1 to 82  | 450.49375<br>451.50625 |
| R | Fixed point-to-multipoint<br>(two frequency, base receive)                   | 451.5125<br>452.5000   | V | 12.5<br>(see note 3) | 451.50625 + n<br>(0.0125) | 1 to 79  | 451.51875<br>452.49375 |
| S | Land mobile service<br>(two frequency, base receive)<br>(see note 2)         | 452.5000<br>457.50625  | X | 12.5                 | 452.5 + n (0.0125)        | 1 to 400 | 452.5125<br>457.5000   |
| T | Land mobile service<br>(two frequency, base receive)<br>(see notes 4 and 7)  | 457.50625<br>459.9875  | Y | 12.5                 | 457.5 + n (0.0125)        | 1 to 198 | 457.5125<br>459.9750   |

|    |  |                        |    |         |                           |          |                        |
|----|--|------------------------|----|---------|---------------------------|----------|------------------------|
| U  | Fixed point-to-point<br>(two frequency)                                      | 459.9875<br>461.0125   | Q  | 12.5    | 459.98125 + n<br>(0.0125) | 1 to 82  | 459.99375<br>461.00625 |
| V  | Fixed point-to-multipoint<br>(two frequency, base transmit)                  | 461.0125<br>462.0000   | R  | 12.5    | 461.00625 + n<br>(0.0125) | 1 to 79  | 461.01875<br>461.99375 |
| W  | Land mobile service<br>(single frequency) (see note 1)                       | 462.0000<br>462.50625  | -  | 12.5    | 462.0 + n (0.0125)        | 1 to 40  | 462.0125<br>462.5000   |
| X  | Land mobile service<br>(two frequency, base transmit)<br>(see note 2)        | 462.50625<br>467.50625 | S  | 12.5    | 462.5 + n (0.0125)        | 1 to 400 | 462.5125<br>467.5000   |
| Y  | Land mobile service<br>(two frequency, base transmit)<br>(see notes 4 and 7) | 467.50625<br>469.9875  | T  | 12.5    | 467.5 + n (0.0125)        | 1 to 198 | 467.5125<br>469.9750   |
| Z  | Land mobile service<br>(two frequency, base transmit)                        | 469.9875<br>471.21875  | DD | 12.5    | 469.9875 + n (0.0125)     | 1 to 97  | 470.0000<br>471.2000   |
| AA | Land mobile + fixed services<br>(single frequency) (see note 1)              | 471.21875<br>472.21875 | -  | 12.5    | 471.2125 + n (0.0125)     | 1 to 80  | 471.2250<br>472.2125   |
| BB | Land mobile service<br>(two frequency, base transmit)                        | 472.21875<br>474.79375 | FF | 12.5    | 472.2125 + n (0.0125)     | 1 to 206 | 472.2250<br>474.7875   |
| CC | Land mobile service<br>(single frequency)<br>(see notes 1 and 5)             | 474.79375<br>475.19375 | -  | 12.5    | 474.7875 + n (0.0125)     | 1 to 32  | 474.8000<br>475.1875   |
| DD | Land mobile service<br>(two frequency, base receive)                         | 475.19375<br>476.4125  | Z  | 12.5    | 475.1875 + n (0.0125)     | 1 to 97  | 475.2000<br>476.4000   |
| EE | Land mobile service<br>(Citizen Band Radio, single<br>frequency)             | 476.4125<br>477.41875  | -  | 12.5/25 | See note 6                | -        | -                      |
| FF | Land mobile service<br>(two frequency, base receive)                         | 477.41875<br>479.99375 | BB | 12.5    | 477.4125 + n (0.0125)     | 1 to 206 | 477.4250<br>479.9875   |

|    |  |                        |    |      |                       |          |                      |
|----|--|------------------------|----|------|-----------------------|----------|----------------------|
| GG | Land mobile service<br>(two frequency, base receive)                           | 479.99375<br>484.79375 | II | 12.5 | 479.9875 + n (0.0125) | 1 to 384 | 480.0000<br>484.7875 |
| HH | Land mobile service<br>(single frequency) (see note 1)                         | 484.79375<br>485.19375 | -  | 12.5 | 484.7875 + n (0.0125) | 1 to 32  | 484.8000<br>485.1875 |
| II | Land mobile service<br>(two frequency, base transmit)                          | 485.19375<br>489.99375 | GG | 12.5 | 485.1875 + n (0.0125) | 1 to 384 | 485.2000<br>489.9875 |
| JJ | Land mobile service<br>(two frequency, base transmit)                          | 489.99375<br>494.79375 | LL | 12.5 | 489.9875 + n (0.0125) | 1 to 384 | 490.0000<br>494.7875 |
| KK | Land mobile service<br>(single frequency) (see note 1)                         | 494.79375<br>495.19375 | -  | 12.5 | 494.7875 + n (0.0125) | 1 to 32  | 494.8000<br>495.1875 |
| LL | Land mobile service<br>(two frequency, base receive)                           | 495.19375<br>499.99375 | JJ | 12.5 | 495.1875 + n (0.0125) | 1 to 384 | 495.2000<br>499.9875 |
| MM | Land mobile service<br>(two frequency, base transmit)                          | 499.99375<br>500.99375 | RR | 12.5 | 499.9875 + n (0.0125) | 1 to 80  | 500.0000<br>500.9875 |
| NN | Land mobile + fixed services<br>(two frequency, base transmit)<br>(see note 9) | 500.99375<br>504.99375 | SS | 12.5 | 500.9875+ n (0.0125)  | 1 to 320 | 501.0000<br>504.9875 |
| OO | Land mobile service<br>(two frequency, base transmit)                          | 504.99375<br>507.01875 | TT | 12.5 | 504.9875 + n (0.0125) | 1 to 162 | 505.0000<br>507.0125 |
| PP | Land mobile service<br>(two frequency, base transmit)                          | 507.01875<br>509.54375 | UU | 12.5 | 507.0125 + n (0.0125) | 1 to 202 | 507.0250<br>509.5375 |
| QQ | Land mobile service<br>(single frequency) (see note 1)                         | 509.54375<br>509.99375 | -  | 12.5 | 509.5375 + n (0.0125) | 1 to 36  | 509.5500<br>509.9875 |
| RR | Land mobile service<br>(two frequency, base receive)                           | 509.99375<br>510.99375 | MM | 12.5 | 509.9875 + n (0.0125) | 1 to 80  | 510.0000<br>510.9875 |
| SS | Land mobile + fixed services<br>(two frequency, base receive)<br>(see note 9)  | 510.99375<br>514.99375 | NN | 12.5 | 510.9875 + n (0.0125) | 1 to 320 | 511.0000<br>514.9875 |

|    |   |                        |    |      |                       |          |                      |
|----|---|------------------------|----|------|-----------------------|----------|----------------------|
| TT | Land mobile service<br>(two frequency, base receive)            | 514.99375<br>517.01875 | OO | 12.5 | 514.9875 + n (0.0125) | 1 to 162 | 515.0000<br>517.0125 |
| UU | Land mobile service<br>(two frequency, base receive)            | 517.01875<br>519.54375 | PP | 12.5 | 517.0125 + n (0.0125) | 1 to 202 | 517.0250<br>519.5375 |
| VV | Land mobile + fixed services<br>(single frequency) (see note 1) | 519.54375<br>520.0000  | -  | 12.5 | 519.5375 + n (0.0125) | 1 to 36  | 519.5500<br>519.9875 |

### Notes:

1. The land mobile service allocation in segments G, H, L, P, W, AA, CC, HH, KK, QQ, and VV is intended primarily to support single frequency low power applications. Assignments may be made to single frequency high power land mobile applications in low density and remote density areas on sites where the proposed licensee is the only licensee holding assignments in the 400 MHz band, i.e. use of high power single frequency applications is not generally supported on communal sites where more than one licensee holds assignments in the 400 MHz band.
2. Area wide single frequency data applications employing high duty cycle (e.g. Differential GPS transmitters) are designated the following channels: Segment S channels 362, 363, 364, 365, 366; Segment X channels 362, 363, 364, 365, 366. The use of 12.5 kHz systems is preferred; however channels may be aggregated to accommodate 25 kHz systems.
3. In segments R and V channel bandwidths of 25 kHz may be used provided the requirements of RALI FX16 are met.
4. The frequencies 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz may be used by on-board communication stations in the Maritime Mobile Service. Care should be taken when assigning these channels near the coastline or inland water-ways because of the potential to receive interference from, or cause interference to the Maritime Mobile Service.
5. The segment CC may be used by the fixed service outside of the areas defined as high density and medium density areas.
6. See the Radiocommunications (Citizen Band Radio Stations) Class Licence 2002 for channel details.
7. Segments A, C, F, I, K, L, N, O, T and Y are to be used exclusively for Australian, State and Territory Government purposes, with the exception of:
  - bands in Segment O defined in Australian Radiofrequency Spectrum Plan, Australian footnote AUS94;
  - the frequencies listed in note 4 (used for the maritime mobile service); and
  - rail industry use in the frequency ranges described in note 8.

Any use within these segments must be endorsed by the relevant state/territory communications authority, which is usually its National Coordinating Committee for Government Radiocommunications (NCCGR) representative<sup>4</sup>.
8. Use for the land mobile service within the frequency ranges 408.64375 – 409.04375 MHz and 418.09375 – 418.49375 MHz and on the frequencies

<sup>4</sup> Information and contact details are at <http://nccgr.govspace.gov.au/>

410.625 MHz, 411.375 MHz, 411.625 MHz, 412.375 MHz, 450.050 MHz and 450.4125 MHz is principally for the purposes of the rail industry. The Australasian Railway Association<sup>5</sup> is normally consulted in considering use of this spectrum. Frequency assignment practice no. 7, *Assigning rail industry spectrum in the 400 MHz band* should be consulted when considering making an assignment in this spectrum.

9. Channels 201 to 320 of segments NN and SS (as specified in Table 1) are also available for use for the fixed service (point-to-multipoint, two frequency). Segment NN shall be used for base transmit and segment SS shall be used for base receive.
10. Segments E/M are designated for use by non-government licensees. No new assignments are to be made to government services, however government services licenced before 2010 may continue to operate in these segments.

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<sup>5</sup> Contact details are at <http://www.ara.net.au/site/index.php>

Figure 1: 400 MHz narrowband services diagram, January 2015

## Figure 1: 400 MHz Narrowband Services Diagram – January 2015

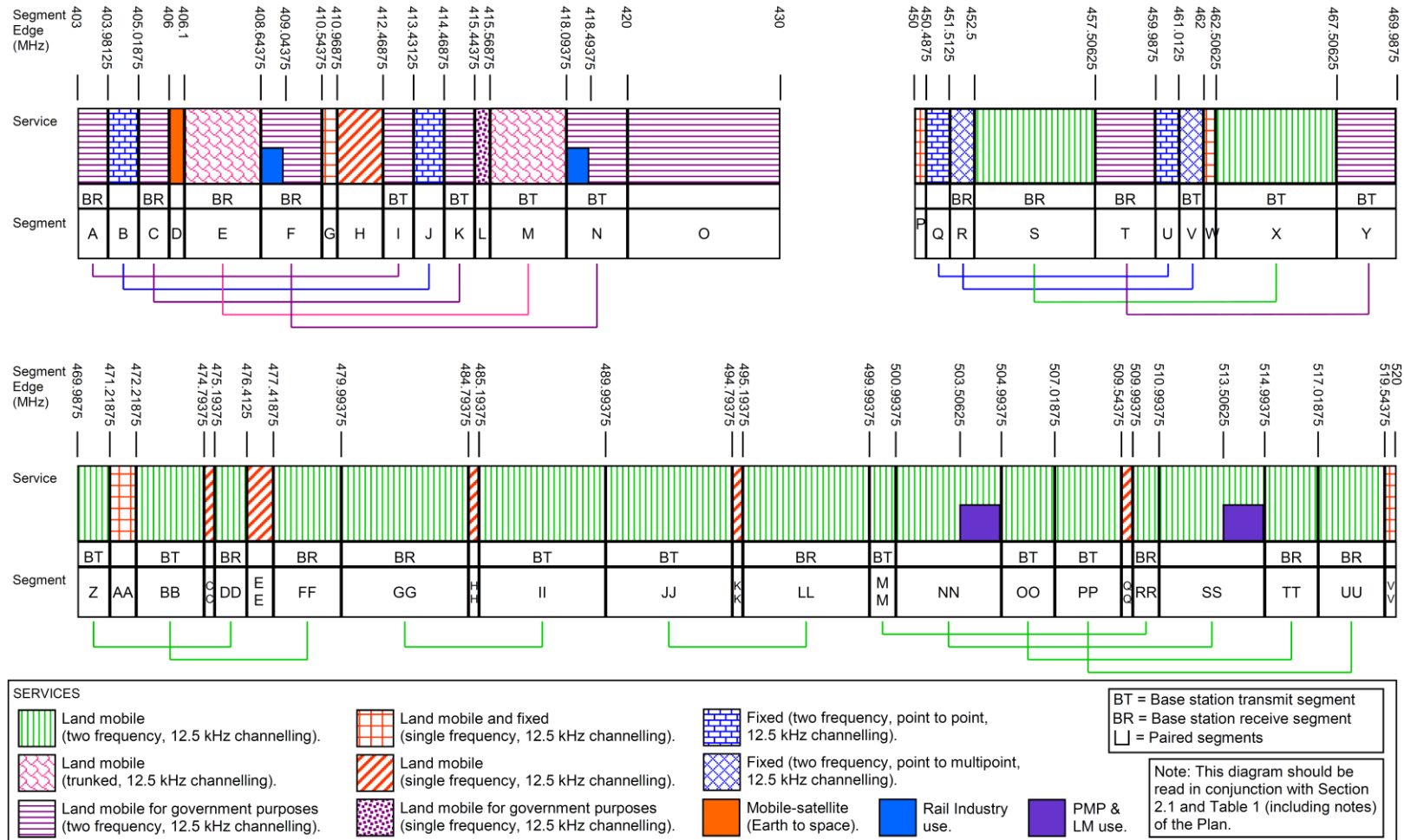


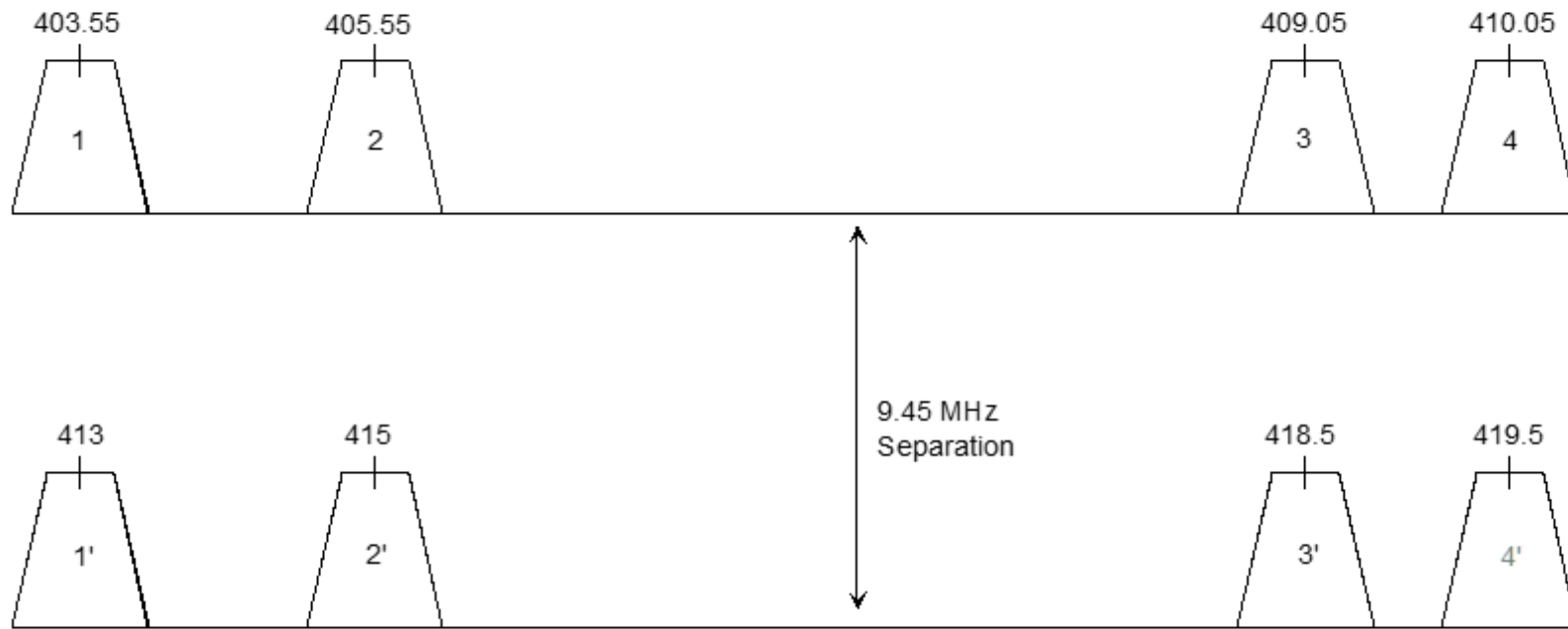
Table 2: Channelling arrangements for the 400 MHz wideband fixed point-to-point services (see notes), January 2015

| Channel |                        | Paired Channel |                        |
|---------|------------------------|----------------|------------------------|
| No      | Centre Frequency (MHz) | No             | Centre Frequency (MHz) |
| 1       | 403.55                 | 1'             | 413                    |
| 2       | 405.55                 | 2'             | 415                    |
| 3       | 409.05                 | 3'             | 418.5                  |
| 4       | 410.05                 | 4'             | 419.5                  |
| 1'      | 413                    | 1              | 403.55                 |
| 2'      | 415                    | 2              | 405.55                 |
| 3'      | 418.5                  | 3              | 409.05                 |
| 4'      | 419.5                  | 4              | 410.05                 |

**Notes:**

1. Assignments to the 400 MHz wideband fixed point-to-point service should not be made within 200 kilometres of Adelaide, Brisbane, Melbourne, Perth or Sydney.
2. The emission bandwidth of the 400 MHz wideband fixed point-to-point service is between 150–750 kHz.

Figure 2: 400 MHz wideband fixed point-to-point service diagram, January 2015





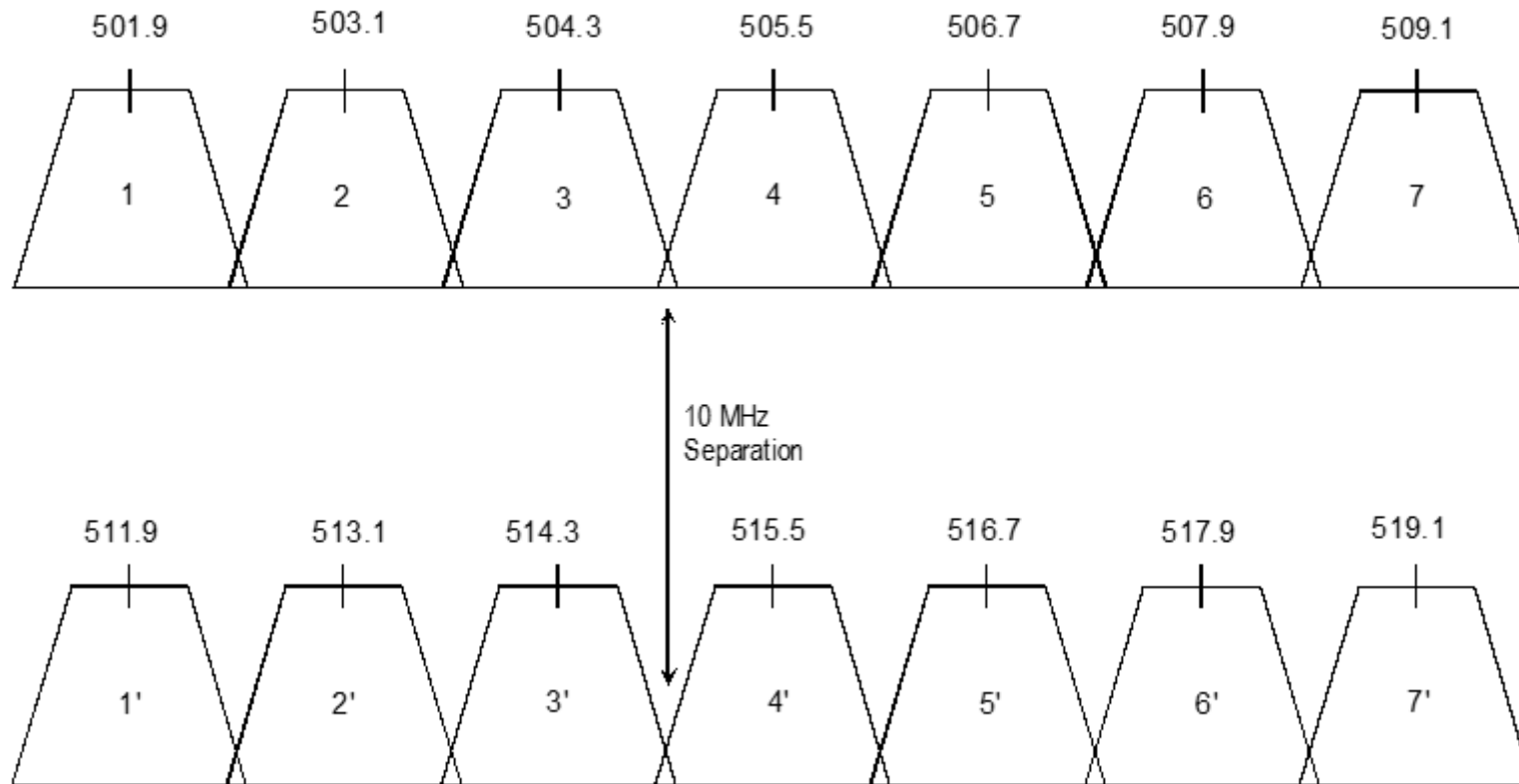
**Table 3: Channelling arrangements for the 400 MHz wideband fixed point-to-multipoint service (see notes), January 2015**

| Channel |                        | Paired channel |                        |
|---------|------------------------|----------------|------------------------|
| No      | Centre frequency (MHz) | No             | Centre frequency (MHz) |
| 1       | 501.9                  | 1'             | 511.9                  |
| 2       | 503.1                  | 2'             | 513.1                  |
| 3       | 504.3                  | 3'             | 514.3                  |
| 4       | 505.5                  | 4'             | 515.5                  |
| 5       | 506.7                  | 5'             | 516.7                  |
| 6       | 507.9                  | 6'             | 517.9                  |
| 7       | 509.1                  | 7'             | 519.1                  |
| 1'      | 511.9                  | 1              | 501.9                  |
| 2'      | 513.1                  | 2              | 503.1                  |
| 3'      | 514.3                  | 3              | 504.3                  |
| 4'      | 515.5                  | 4              | 505.5                  |
| 5'      | 516.7                  | 5              | 506.7                  |
| 6'      | 517.9                  | 6              | 507.9                  |
| 7'      | 519.1                  | 7              | 509.1                  |

**Notes:**

1. Assignments to the 400 MHz wideband fixed point-to-multipoint service should not be made within 200 kilometres of capital cities.
2. The nominal emission bandwidth of the 400 MHz wideband fixed point-to-multipoint service is 1.82 MHz.
3. Emission bandwidths up to 2 MHz may be used on a case by case basis provided due consideration is given to services operating in adjacent spectrum.

Figure 3: 400 MHz wideband fixed point-to-multipoint service diagram, January 2015



**Table 4: Channels for single frequency area wide assignments**

| Segment/Channel number | 12.5 KHz B/W Centre frequency | 25 KHz B/W Centre Frequency |
|------------------------|-------------------------------|-----------------------------|
| Segment G Ch13         | 410.7 MHz                     | 410.70625 MHz               |
| Segment G Ch14         | 410.7125 MHz                  |                             |
| Segment P Ch7          | 450.1 MHz                     | 450.10625 MHz               |
| Segment P Ch8          | 450.1125MHz                   |                             |
| Segment W Ch9          | 462.1125 MHz                  | 462.11875 MHz               |
| Segment W Ch10         | 462.125 MHz                   |                             |
| Segment AA Ch33        | 471.625 MHz                   | 471.63125 MHz               |
| Segment AA Ch34        | 471.6375 MHz                  |                             |
| Segment AA Ch55        | 471.9 MHz                     | 471.90625 MHz               |
| Segment AA Ch56        | 471.9125 MHz                  |                             |
| Segment CC Ch21        | 475.05 MHz                    | 475.05625 MHz               |
| Segment CC Ch22        | 475.0625 MHz                  |                             |
| Segment HH Ch25        | 485.1 MHz                     | 485.10625 MHz               |
| Segment HH Ch26        | 485.1125 MHz                  |                             |
| Segment KK Ch17        | 495.00 MHz                    | 495.00625 MHz               |
| Segment KK Ch18        | 495.0125 MHz                  |                             |
| Segment QQ Ch27        | 509.875 MHz                   | 509.88125 MHz               |
| Segment QQ Ch28        | 509.8875 MHz                  |                             |

**Table 5: Channels for two frequency area wide assignments**

| Paired Segments/Channel number | 12.5 KHz B/W frequency pair | 25 KHz B/W frequency pair |
|--------------------------------|-----------------------------|---------------------------|
| Segment X/S ch 273             | 465.9125/455.9125 MHz       | 465.91875/455.91875 MHz   |
| Segment X/S ch 274             | 465.925/455.925 MHz         |                           |
| Segment Z/DD ch 81             | 471.00/476.2 MHz            | 471.00625/476.20625 MHz   |
| Segment Z/DD ch 82             | 471.0125/476.2125 MHz       |                           |
| Segment BB/FF ch 165           | 474.275/479.475 MHz         | 474.28125/479.48125 MHz   |
| Segment BB/FF ch 166           | 474.2875/479.4875 MHz       |                           |
| Segment II/GG ch 95            | 486.375/481.175 MHz         | 486.38125/481.18125 MHz   |
| Segment II/GG ch 96            | 486.3875/481.1875 MHz       |                           |
| Segment JJ/LL ch 191           | 492.375/497.575 MHz         | 492.38125/497.58125 MHz   |
| Segment JJ/LL ch 192           | 492.3875/497.5875 MHz       |                           |
| Segment OO/TT ch 95            | 506.175/516.175 MHz         | 506.18125/516.18125 MHz   |
| Segment OO/TT ch 96            | 506.1875/516.1875 MHz       |                           |
| Segment PP/UU ch 61            | 507.775/517.775 MHz         | 507.78125/517.78125 MHz   |
| Segment PP/UU ch 62            | 507.7875/517.7875 MHz       |                           |
| Segment ch 91                  | 502.125/512.125 MHz         |                           |
| Segment ch 103                 | 502.275/512.275 MHz         |                           |
| Segment ch 115                 | 502.425/512.425 MHz         |                           |
| Segment ch 127                 | 502.575/512.575 MHz         |                           |
| Segment ch 139                 | 502.725/512.725 MHz         |                           |

## Appendix B: Transition to new arrangements

This Appendix describes the remaining transition arrangements. A comprehensive list of transition requirements can be found in the document [The Way Ahead – Timeframes and Implementation Plans for the 400MHz Band discussion paper](http://www.acma.gov.au/theACMA/the-way-ahead-timeframes-and-implementation-plans-for-the-400-mhz------band)<sup>6</sup>.

The ACMA intends to have new arrangements in the 400 MHz band in place by 31 December 2015 in high and medium density areas and by 31 December 2018 in other areas.

Transition consists of three phases:

- > Phase 1: Creation of vacant channels
- > Phase 2: Implementation of 10 MHz duplex frequency split in 450-470 MHz
- > Phase 3: Implementation of the harmonised government spectrum.

These phases will overlap somewhat. Longer time frames for transition are proposed outside of high and medium density areas where spectrum is less congested. Those high power land mobile and point-to-multipoint licensees with base stations closer than 100 km to the boundary of a high or medium density area and a low or remote density area will be required to meet the high and medium density area deadlines. For example, a high power two frequency land mobile user within 100 kilometres of a high or medium density area will be required to meet the high and medium density area deadline. Similarly, high and medium density area deadlines will be required to be met by fixed point-to-point users with one end of their link in a high or medium density area and the other outside of these areas.

### Phase 1: Creation of vacant channels

Licensees in HDAs and MDAs were required to implement milestone one measures **by 31 December 2012**. Licensees outside of HDAs and MDAs were required to implement the measures applicable in these areas by **31 December 2013**. This deadline was limited to users not affected by the implementation of the harmonised government band and the 10 MHz duplex frequency split in 450–470 MHz.

### Phase 2: Implementation of 10 MHz duplex frequency split in 450–470 MHz

The transition to a 10 MHz duplex frequency split in 450–470 MHz has been broken down into a number of steps. These steps are:

1. Clearance of users from 452.5–453 MHz and 462–462.5 MHz into temporary licences in 440–450 MHz or into space created in 469.9875–520 MHz. Users were required to implement the measures to address congestion applicable to them simultaneously with their relocation. For example, a 25 kHz channel bandwidth user in a high or medium density area would be required to transition to 12.5 kHz channelling when transitioning to a new frequency.
2. Clearance of users from segment Y (469.4875-469.9875 MHz) into channels into 462–462.5 MHz or into space created in 469.9875–520 MHz. Users were required to implement the measures to address congestion applicable to them simultaneously with their relocation. For example, a high power single frequency land mobile user in a high or medium density area will be required to transition to a low power service when transitioning to a new frequency.
3. Following step 1, transition of users to a 10 MHz frequency split via a move of the base receive segment down by 0.5 MHz. Alternatively, users can relocate into spectrum reserved for them in 469.9875–520 MHz. Simultaneously, government users in 453–457.5 MHz and 462.5–467 MHz will relocate into harmonised government spectrum and non-government users in 457.5–459.9875 MHz and 467–469.4875 MHz will relocate elsewhere in the 450–470 MHz band, or into another part of the 400 MHz band.

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<sup>6</sup> <http://www.acma.gov.au/theACMA/the-way-ahead-timeframes-and-implementation-plans-for-the-400-mhz------band>

Assignments in segment Y (469.4875-469.9875 MHz), 452.5–453 MHz and 462–462.5 MHz were cleared **by 31 December 2012 in high and medium density areas** and **31 December 2013 outside of high and medium density areas**.

The deadline for step 3 is **31 December 2014 in high and medium density areas** and **31 December 2015 outside of high and medium density areas**.

To facilitate transition to new arrangements in this part of the 400 MHz band, embargoes have been placed Australia wide on all new assignments in 452.5–457.5 MHz and 462–467.5 MHz other than existing users transitioning from 403–420 MHz, and on new assignments in 457.5–459.9875 MHz and 467.5–469.9875 MHz not authorised by the relevant state or territory government NCCGR representative as part of the implementation of harmonised government spectrum. It is the ACMA's intention to maintain the embargo in 452.5–457.5 MHz and 462–467.5 MHz until the end of the transition period to ensure users in 403–420 MHz are given an opportunity to transition within their equipment tuning range. However, the availability of channels in this band will be monitored throughout transition, and the embargo lifted on all or part of this spectrum earlier if possible.

### **Phase 3: Implementation of the harmonised government band**

The implementation of the harmonised government band will require:

- > the relocation of non-government users currently in segments identified for harmonised government use to elsewhere in the band
- > the relocation of government users into the segments identified for harmonised government use.

Government users currently operating above 470 MHz will require spectrum in 450–470 MHz to enable transition within the tuning range of existing equipment. Therefore, time will be required following the completion of Phase 2 of transition to enable the implementation of the harmonised government band.

To provide time between the finalisation of arrangements supporting a 10 MHz duplex frequency split in 450–470 MHz and the implementation of the harmonised government band, users will be allowed until **31 December 2015** to implement the harmonised government band in high and medium density areas. In other words, non-government users will be required to relocate out of harmonised government segments by 31 December 2015 in high and medium density areas, and government users will be required to move into the harmonised government segments by 31 December 2015 in high and medium density areas.

Similarly to other phases of transition, an extended deadline will be provided for transition outside of high and medium density areas. Users will be allowed until 31 December 2018 to implement the harmonised government band outside of high and medium density areas. In other words, non-government users will be required to relocate out of harmonised government segments by **31 December 2018** outside of high and medium density areas, and government users will be required to move into the harmonised government segments by 31 December 2018 outside of high and medium density areas.