****

**APT SURVEY REPORT ON**

**FREQUENCY BANDS IN RELATION TO STUDY ON WRC-15 AGENDA ITEM 1.1**

**Edition: September 2014**

**The 17th Meeting of APT Wireless Group**

**23 – 26 September 2014**

**Macao, China**

***(Source: AWG-17/OUT-01)***

**No. APT/AWG/REP-50**

**APT SURVEY Report on frequency bands in relation to**

**study on WRC-15 Agenda item 1.1**

**Table of Contents**

[1. Background 2](#_Toc400456151)

[2. Questionnaire Summary 2](#_Toc400456152)

[3. Questionnaire Responses 3](#_Toc400456153)

[4. APT member’s current usage status in the bands 3](#_Toc400456154)

[4.1. Australia 3](#_Toc400456155)

[4.2. Bangladesh 12](#_Toc400456156)

[4.3. China 13](#_Toc400456157)

[4.4. Japan 17](#_Toc400456158)

[4.5. Republic of Korea 20](#_Toc400456159)

[4.6. New Zealand 23](#_Toc400456160)

[4.7. Thailand 25](#_Toc400456161)

[5. System characteristics for consideration in sharing/compatibility studies in the bands 26](#_Toc400456162)

[5.1 Australia 26](#_Toc400456163)

[5.2 Bangladesh 28](#_Toc400456164)

[5.3 China 28](#_Toc400456165)

[5.4 Japan 33](#_Toc400456166)

[5.5 Republic of Korea 34](#_Toc400456167)

[5.6 New Zealand 34](#_Toc400456168)

[6. Sharing/compatibility studies in the bands 35](#_Toc400456169)

[6.1 Australia 35](#_Toc400456170)

[6.2 Bangladesh 37](#_Toc400456171)

[6.3 China 37](#_Toc400456172)

[6.4 Japan 39](#_Toc400456173)

[6.5 Republic of Korea 40](#_Toc400456174)

[6.6 New Zealand 40](#_Toc400456175)

[7. APT member’s future plan in the bands 41](#_Toc400456176)

[7.1 Australia 41](#_Toc400456177)

[7.2 Bangladesh 42](#_Toc400456178)

[7.3 China 42](#_Toc400456179)

[7.4 Japan 42](#_Toc400456180)

[7.5 Republic of Korea 43](#_Toc400456181)

[7.6 New Zealand 43](#_Toc400456182)

[8. Bands possible to satisfy the future development of IMT systems 43](#_Toc400456183)

[8.1 Australia 43](#_Toc400456184)

[8.2 Bangladesh 43](#_Toc400456185)

[8.3 China 43](#_Toc400456186)

[8.4 Japan 44](#_Toc400456187)

[8.5 Republic of Korea 44](#_Toc400456188)

[8.6 New Zealand 44](#_Toc400456189)

[9. Others (additional issue to be addressed) 44](#_Toc400456190)

[9.1 Australia 44](#_Toc400456191)

[9.2 Republic of Korea 44](#_Toc400456192)

[9.3 New Zealand 44](#_Toc400456193)

**APT** **survey report on frequency bands in relation to study on WRC-15 Agenda item 1.1**

# Background

WRC-15 Agenda Item 1.1 is to consider *additional spectrum allocations to the Mobile Service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution* ***233*** *(****WRC-12****)*. ITU-R established a Joint Task Group (JTG 4-5-6-7) to undertake relevant studies associated with this Agenda Item.

At its sixth meeting in July 2014, JTG 4-5-6-7 finalized the table containing a “List of frequency bands with related proposals and associated comments and explanations” (Annex 1 to Document 4-5-6-7/715, <http://www.itu.int/md/R12-JTG4567-C-0715/en>). JTG 4-5-6-7 also finalized the sharing studies on the related bands in the same meeting in July 2014.

The APT Conference Preparatory Group (APG) for WRC-15 is responsible for developing APT positions on WRC-15 Agenda Items 1.1. At the APG15-2 meeting in July 2013, APG developed APT preliminary views on agenda item 1.1, and a table to collect views from APT members on potential candidate bands to facilitate further study in APG. These APT preliminary views and table to collect views from APT members on potential candidate bands for agenda item 1.1 was further updated in the APG15-3 meeting in June 2014.

To facilitate the study in relation to WRC-15 Agenda item 1.1 in APG, AWG-15 developed a questionnaire to collect information on usage and future plan as well as other relevant information for the following frequency bands in Asia Pacific Region:

470-694/698 MHz, 1 300-1 350 MHz, 1 350-1 375 MHz, 1 375-1 400 MHz, 1 427-1 452 MHz, 1 452-1 492 MHz, 1 492-1 518 MHz, 1 518-1 525/1 527 MHz, 1 695-1 700 MHz, 2 025-2 110 MHz, 2 200-2 290 MHz, 2 700-2 900 MHz, 2 900-3 100 MHz, 3 300-3 400 MHz, 3 400-3 600 MHz, 3 600-3 800 MHz, 3 800-4 200 MHz, 4 400-4 500 MHz, 4 400-4 900 MHz, 4 800-5 000 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz, 5 850-5 925 MHz and 5 925-6 425 MHz.

It should be noted that some of the frequency bands (or portion of them) listed above (i.e., 1300-1350 MHz, 1 525-1 527 MHz, 2 025-2 110 MHz, 2 200-2 290 MHz, 2 900-3 100 MHz, 4 990-5 000 MHz, 5 850-5 925 MHz) are not contained in the list of potential candidate bands in the draft CPM text for WRC-15 agenda item 1.1 developed by ITU-R JTG 4-5-6-7[[1]](#footnote-1).

# Questionnaire Summary

This questionnaire contains six questions to collect information of current spectrum usage, relative system characteristics, progress on sharing/compatibility studies in APT Members, and future plan on the concerned bands.

 **(1) Current usage**

**Question 1:** What is/are current allocation(s) (e.g. mobile service, fixed service, mobile-satellite service), application(s) (e.g. CDMA, UMTS, LTE, GMR, EGAL, etc.) and assigned/licensed in the bands listed above (or part(s) bands) in your country?

**Question 2:** Please describe system characteristics that would be necessary for consideration in sharing/compatibility studies of applications in the bands listed above (or part(s) bands). For example, reference to ITU-R Report/Recommendation or Regulation/Rule/study in your country.

**Question 3:**

Please describe relevant information regarding sharing/compatibility studies between IMT systems and other services taken into consideration in your country in the bands listed above (or part(s) bands). For example, reference to existing studies in your country and/or ITU-R Report/Recommendation or Regulation/Rule/study. Please enclose study report(s) of the existing studies in your country, if available.

 **(2) Future plan**

**Question 4:** Do you have planned or potential future services and applications in the bands listed above (or part(s) bands), if YES, what is/are planned or potential future services and applications in the bands?

**Question 5:** Which bands (or part(s) of these bands) in the list above do you think are possible to satisfy the future development of IMT systems?

 **(3) Others**

**Question 6**: Do you have any additional issue to be addressed for the bands listed above (or part(s) bands)? What is the issue?

# Questionnaire Responses

At the AWG-16 meeting in Pattaya, Thailand, several questionnaire responses were contributed by APT members as listed in the table 1.

Table-1 Questionnaire Responses

|  |  |  |
| --- | --- | --- |
| **No.** | **Document No.** | **Source** |
| 1 | AWG-16/INP-07, AWG-17/INP-34 | Japan |
| 2 | AWG-16/INP-20 | Australia |
| 3 | AWG-16/INP-31 | Sri Lanka |
| 4 | AWG-16/INP-38 | New Zealand |
| 5 | AWG-16/INP-102 | Republic of Korea |
| 6 | AWG-16/INP-103 | China |
| 7 | AWG-16/INF-08 | Thailand |
| 8 | AWG-16/INF-27 | Bangladesh |

# APT member’s current usage status in the bands

## **Australia**

Frequency bands in the table below are based on Australian allocations in the Australian Radiofrequency Spectrum Plan (ARSP).

Intra-service and inter-service frequency assignment requirements, including coordination requirements and procedures based on certain system technical characteristics, are included in Radiocommunications Assignment and Licensing Instructions (RALIs). All RALIs mentioned in this document can be found at: [**http://www.acma.gov.au/Industry/Spectrum/Spectrum-planning/Frequency-assignment-and-coordination/frequency-assignment-requirements-spectrum-planning-acma**](http://www.acma.gov.au/Industry/Spectrum/Spectrum-planning/Frequency-assignment-and-coordination/frequency-assignment-requirements-spectrum-planning-acma).

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency Bands** | **Service** | **Applications** | **Status** |
|
|  470-520 MHz | FIXED, MOBILE | Primarily used for narrowband land mobile services. Other services include narrowband fixed services, citizen band radio and some low interference potential device (LIPD) applications. | The band is heavily utilised, with thousands of assignments to land mobile, fixed services and citizen band radio repeater stations under apparatus licences.The 400 MHz Plan specifies the segments and the channelling arrangements within the bands 403-430 MHz and 450-520 MHz (collectively referred to as the ‘400 MHz band’). The 400 MHz band has recently undergone a comprehensive review to address the congestion in the band and improve its utility.Narrowband land mobile services are subject to coordination requirements in RALI LM 8.Narrowband point-to-multipoint services are subject to coordination requirements in RALI FX 16.Narrowband point-to-point services are subject to coordination requirements in RALI FX 17. |
| 520-694 MHz | BROADCASTING | Used for digital television terrestrial broadcasting (DTTB) services. Other designated uses include some low interference potential device (LIPD) applications, such as wireless audio devices and biomedical telemetry devices. | DTTB transmitters operate at around 700 sites around Australia, providing DTTB coverage to a very high proportion of the population. |
| 1 300-1 350 MHz | AERONAUTICAL RADIONAVIGATION | 1 300-1 350 MHz is designated to be used principally for government agencies. It is designated for use by aeronautical, airborne and ground radar applications (fixed and transportable). | Australia-wide apparatus licence in the band for government agencies. |
| RADIOLOCATION |
| RADIONAVIGATION-SATELLITE |  |  |
| 1 350-1 400 MHz | RADIOLOCATION | Used by airborne surveillance radar, aeronautical mobile telemetry for flight testing and evaluation, airfield radar, ground-based radars (fixed and transportable), and time/space/position information (TSPI). | Australia-wide apparatus licence in the band for government agencies.  |
| 1 427-1 452 MHz | FIXED | Principally used for fixed point-to-point and point-to-multipoint services, including for the delivery of public telecommunications to rural and remote areas. | There are several hundred assignments to fixed point-to-point and point-to-multipoint services in the band under apparatus licences.These fixed services are subject to coordination requirements in RALI FX 3. |
| MOBILE | Aeronautical mobile telemetry (AMT). | In the ARSP, the use of the band 1 435-1 535 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service. |
| 1 452-1 492 MHz | FIXED | Principally used for fixed point-to-point and point-to-multipoint services, including for the delivery of public telecommunications to rural and remote areas. | The 1.5 GHz Band Plan limits the use of the band 1 452-1 492 MHz to *existing* (pre-1997) fixed services, and to point-to-multipoint services providing public telecommunications services to rural and remote areas.There are hundreds of assignments to fixed point-to-point and point-to-multipoint services in the band.These fixed services are subject to coordination requirements in RALI FX 3. |
| MOBILE | AMT | The 1.5 GHz Band Plan limits the use of the band 1 452-1 492 MHz to *existing* (pre-1997) mobile services. |
| BROADCASTING, BROADCASTING-SATELLITE | - | The 1.5 GHz Band Plan prohibits the use of the band 1 452-1 492 MHz for broadcasting and broadcasting-satellite services. No licensed use in Australia. |
| 1 492-1 518 MHz | FIXED | Principally used for fixed point-to-point and point-to-multipoint services, including for the delivery of public telecommunications to rural and remote areas. | There are several hundred assignments to fixed point-to-point and point-to-multipoint services in the band.These fixed services are subject to coordination requirements in RALI FX 3. |
| 1 518-1 525 MHz | FIXED |
| MOBILE-SATELLITE (space-to-Earth) | - | No licensed use in Australia. |
| 1 695-1 700 MHz | METEOROLOGICAL AIDS | - | No licensed use in Australia. |
| METEOROLOGICAL-SATELLITE (space-to-Earth) | Primary metsat downlink, used in Australia to receive data from MTSAT, FengYun-1 and -2, GOES, Meteosat (also for ranging), NOAA POES and OrbView-2 satellites). | Apparatus licences issued for this use. |
| 2 025-2 110 MHz | SPACE OPERATION / EARTH EXPLORATION-SATELLITE / SPACE RESEARCH(Earth-to-space)(space-to-space) | Primary tracking, telemetry and control (TT&C) band.  | The bands are used for TT&C in Australia by the European Space Agency (ESA) at their ESTRACK stations at Landsdale and New Norcia, and by the CSIRO at Mingenew and the Canberra Deep Space Communications Complex (CDSCC) Deep Space Stations (DSS) at Tidbinbilla, including for launch and early orbit phase (LEOP) support and communications with spacecraft. Geoscience Australia also operates beacons that transmit to the DORIS satellite system. The bands are also used by the Bureau of Meteorology’s turn around and ranging station and by some educational institutions. |
| FIXED | The band 2 010-2 110 MHz has been identified for long-term use by television outside broadcasting services (TVOB). The band is also used by some existing fixed point-to-point links. | Under ACMA Embargo 23, there are no new assignments for new fixed or mobile services in the band 2 010-2 110 MHz inside areas of high or frequency TVOB usage. Applications for TVOB services will be considered on a case-by-case basis, and arrangements for TVOB services are under development for future inclusion in RALI FX 21.There are a few assignments to TVOB services and around a hundred assignments to fixed point-to-point links under apparatus licences. |
| 2 200-2 290 MHz | SPACE OPERATION / EARTH EXPLORATION-SATELLITE / SPACE RESEARCH(space-to-Earth)(space-to-space) | Primary TT&C band.  | The band is used for TT&C in Australia by the European Space Agency (ESA) at their ESTRACK stations at Landsdale and New Norcia, and by the CSIRO at Mingenew and the Canberra Deep Space Communications Complex (CDSCC) Deep Space Stations (DSS) at Tidbinbilla, including for launch and early orbit phase (LEOP) support and communications with spacecraft. The band is also used by some educational institutions. |
| FIXED | The band 2 200-2 300 MHz has been identified for long-term use by television outside broadcasting services (TVOB). The band is also used by some existing fixed point-to-point links. | Under ACMA Embargo 23, there are no new assignments for new fixed or mobile services in the band 2 200-2 300 MHz inside areas of high or frequency TVOB usage. Applications for TVOB services will be considered on a case-by-case basis, and arrangements for TVOB services are under development for future inclusion in RALI FX 21.There are small numbers of assignments to fixed point-to-point links under apparatus licences. |
| MOBILE | AMT | Australia-wide apparatus licence in the band for government agencies.  |
| 2 700-2 900 MHz | AERONAUTICAL RADIONAVIGATION | Primary band for Air Traffic Control, aeronautical surveillance and meteorological radar | Use by Australian government agencies is managed through assignments under apparatus licences held by Airservices Australia (for primary surveillance radar (PSR)), Bureau of Meteorology (Weather Watch and wind-finding radars) and other government agencies. |
| 2 900-3 100 MHz | RADIOLOCATION, RADIONAVIGATION | Shipborne radionavigation and surveillance radars. | Class and apparatus licensing for radars. Numerous assignments under apparatus licences for radar beacons (racons) operated by the Australian Maritime Safety Authority (AMSA) at 3 100 MHz. |
| 3 300-3 400 MHz | RADIOLOCATION | Designated for use by the government agencies responsible for national security and protection. primary application is for shipborne surveillance radars. | Australia-wide apparatus licence in the band for government agencies. |
| Amateur | Some amateur use of the band on a secondary basis. | A few amateur apparatus licences in the band. |
| 3 400-3 600 MHz | FIXED | Fixed wireless access (FWA) in certain cities and regional areas, and broadband wireless access (BWA) in rural and remote areas.Digital high-capacity, long-haul point-to-point links in the 3.8 GHz band. | 3 425-3 442.5 MHz / 3 475-3 492.5 MHz is spectrum licensed in certain major cities and towns and primarily used for FWA. In areas not subject to spectrum licensing it is primarily used for point-to-multipoint services for FWA, subject to coordination requirements in RALI FX 14. Around 100 device registrations made under spectrum licences in major cities and towns, and around 100 assignments to point-to-multipoint systems elsewhere.3 442.5-3 475 MHz / 3 542.5-3 575 MHz is spectrum licensed in certain regional and urban areas and primarily used for FWA. Hundreds of device registrations in Sydney and Melbourne.3 575-3 600 MHz is used for fixed point-to-multipoint services for BWA in rural and remote areas. This use is subject to coordination requirements in RALI FX 19. Around 100 assignments to point-to-multipoint services. Embargo 42 limits new assignments in the band to those for BWA outside of state and territory capital cities. No assignments to other services may be made in the band Australia-wide.The 3.8 GHz point-to-point link band, defined in RALI FX 3, begins at 3 590 MHz. Around 30 existing links licensed in Channel 1 of the 3.8 GHz band. |
| RADIOLOCATION | Designated for use by Australian government agencies responsible for national security and defence. Primary application is for shipborne surveillance radars. Some amateur service use on a secondary basis. | Australia-wide apparatus licence in the band for government agencies. |
| 3 600-3 800 MHz | FIXED | BWA services in rural and remote areas.Digital high-capacity, long-haul point-to-point links in the 3.8 GHz band. | 3 600-3 700 MHz is used for fixed point-to-multipoint services for BWA in rural and remote areas. This use is subject to coordination requirements in RALI FX 19. Around 150 assignments to point-to-multipoint services. Embargo 42 limits new assignments in the band to those for BWA outside of Australian state and territory capital cities. No assignments to other services may be made in the band Australia-wide.The lower sub-band of the 3.8 GHz point-to-point link band, defined in RALI FX 3, is from 3 590-3 870 MHz. Around 30 existing links in Channels 2 and 3 of the 3.8 GHz band, currently embargoed (Embargo 42). Around 100 assignments to point-to-point links above 3 700 MHz. |
| MOBILE except aeronautical mobile |  | No licensed use in Australia. |
| FIXED-SATELLITE | C-band downlink. | Around 100 assignments to earth stations in the band. note: ubiquitous, uncoordinated deployment of earth stations in bands shared with terrestrial services is not supported in Australia. |
| 3 800-4 200 MHz | FIXED | Digital high-capacity, long-haul point-to-point links in the 3.8 GHz band. | The upper sub-band of the 3.8 GHz point-to-point link band, defined in RALI FX 3, is from 3 910-4 190 MHz. Around 60 existing links in Channels 1’, 2’ and 3’ of the 3.8 GHz band, affected by the Embargo 42 in the lower sub-band. Around 100 assignments to point-to-point links above 4 030 MHz. |
| MOBILE except aeronautical mobile |  | No licensed use in Australia. |
| FIXED-SATELLITE | C-band downlink. | Around 100 assignments to earth stations in the band. Note: Ubiquitous, uncoordinated deployment of earth stations in bands shared with terrestrial services is not supported in Australia. |
| 4 400-4 800 MHz | FIXED | Designated for use by Australian government agencies responsible for national security and defence. Use includes wide-band fixed and mobile systems, AMT, unmanned aerial vehicle (UAV) systems and tropospheric scatter systems.  | Australia-wide apparatus licence in the band for government agencies. |
| FIXED-SATELLITE (space-to-Earth)(4 500-4 800 MHz only) |
| MOBILE |
| 4 800-5 000 MHz | FIXED | Designated for use by Australian government agencies responsible for national security and defence. Use includes wide-band fixed and mobile systems, AMT, UAV systems and tropospheric scatter systems.4 940-4 990 MHz used by broadband systems by public protection and disaster relief (PPDR) organisations | Australian government agencies hold an Australia-wide apparatus licence in the band 4 800-4 990 MHz.Channelling arrangements, emission masks, and measures to protect radio astronomy facilities are set out in *Radiocommunications (Public Safety and Emergency Response) Class Licence 2013* |
| MOBILE |
| RADIO ASTRONOMY (secondary in 4 800-4 990 MHz) | Radio astronomy facilities at Parkes and Narrabri |  |
| 5 350-5 470 MHz | EARTH EXPLORATION-SATELLITE (active) | Synthetic aperture radar (SAR), radar altimeters and wind scatterometers | EESS radars include SAR aboard Radarsat-1 and -2 and Envisat, the Poseidon radar altimeters aboard Jason-1 and -2, wind scatterometer (ASCAT) aboard MetOp-A, and the ERS-1 and -2 Active Microwave Instrument (AMI—capable of performing both SAR and wind scatterometer functions). |
| SPACE RESEARCH (active) |  |  |
| AERONAUTICAL RADIONAVIGATION (5 350-5 460 MHz)RADIONAVIGATION(5 460-5 470 MHz) | Airborne weather radars |  |
| RADIOLOCATION | Shipborne and land-based surveillance radar |  |
| 5 725-5 850 MHz | RADIOLOCATION | Shipborne and land-based surveillance radar. Designated for use by the government agencies responsible for national security and defence.  | Australia-wide apparatus licence in the band for government agencies.. |
| Amateur | Some amateur use of the band on a secondary basis. | A few amateur apparatus licences in the band. |
| Amateur-satellite (space-to-Earth) |
| Fixed (no allocation in the ITU Radio Regulations (RR)) | 5 735-5 755 MHz and 5 775-5 795 MHz—fixed point-to-point backhaul links for the provision of BWA to regional and rural areas (5.8 GHz band)5 725-5 850 MHz—digital modulation transmitters and frequency hopping transmitters (including WiFi and WiMAX) | In Australia, the band may be used by stations of the fixed service on the condition that harmful interference is not caused to stations of other services operating in accordance with the ARSP or the RR.There are hundreds of assignments to 5.8 GHz fixed point-to-point services in the band. |
| 5 725-5 875 MHz | ISM (no allocation in RR) |  | According to RR No. **5.150**, the band is also designated for industrial, scientific and medical (ISM) applications. |
| 5 850-5 925 MHz | FIXED | Medium- and high-capacity fixed point-to-point links in the 6 GHz band. | The 6 GHz band, defined in RALI FX 3, begins at 5 915.55 MHz. Only one assignment to a point-to-point link on Channel 1I in the 6 GHz band. |
| MOBILE |  | No licensed use in Australia. |
| FIXED-SATELLITE (Earth-to-space) | C-band uplink. | Around 20 assignments to earth stations in the band. Note: Ubiquitous, uncoordinated deployment of Earth stations in bands shared with terrestrial services is not supported in Australia. |
| Radiolocation |  |  |
| 5 925-6 700 MHz | FIXED | Medium- and high-capacity fixed point-to-point links in the 6 GHz band.Digital high capacity fixed point-to-point links in the 6.7 GHz band. | Around 2,000 assignments to fixed point-to-point links in the 6 GHz band.Over 1,000 assignments to fixed point-to-point links in the 6.7 GHz band. |
| MOBILE |  | No licensed use in Australia. |
| FIXED-SATELLITE (Earth-to-space) | C-band uplink. | Hundreds of assignments to earth stations in the band. Note: Ubiquitous, uncoordinated deployment of Earth stations in bands shared with terrestrial services is not supported in Australia. |
| 5.458 (no allocation in RR) | 6 425-7 075 MHz—passive EESS measurements over oceans | No licensed use in Australia. |

Note: Apparatus licences in Australia have duration of up to 5 years.

## **Bangladesh**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency Bands****(MHz)** | **Service****(Please indicate frequency range(s) for each service)** | **Applications** | **Status****(e.g. Commercial Operator/ License duration)** |
|
| 825-845/870-890  | 1. Mobile Service | CDMA | Commercial/15 years |
| 2. Mobile Service | E-GSM | Commercial/15 years |
| 3. Fixed Service | PSTN | Commercial/5 years |
| 890-925/935-960 | Cellular Mobile | GSM | Commercial/15 years |
| 1710-1785/1805-1880 | Cellular Mobile | GSM | Commercial/15 years |
| 1920-1980/2110-2170 | Mobile Service | UMTS | Commercial/15 years |
| 2300-2400 | BWA | TD-LTE | Commercial/15 years |
| 2500-2690 | BWA | LTE, TD-LTE | Commercial/15 years |
| 3400-3500/3500-3600 | Fixed  | FWA |  |

## **China**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency Bands** | **Service****(Please indicate frequency range(s) for each service)** | **Applications** | **Status****(e.g. Commercial Operator/ License duration)** |
| 470-694/698 MHz | BROADCASTING | Free public services | Non-commercial use |
| 1 300-1 350 MHz | AERONAUTICAL RADIONAVIGATION RADIOLOCATIONRADIO NAVIGATION-SATELLITE (Earth-to-space) | Primary surveillance radars | Non-commercial use |
| 1 350-1 400 MHz | RADIOLOCATIONRADIO ASTRONOMY | Radiolocation radarsRadio Astronomy | Non-commercial use |
| 1 427-1 452 MHz | FIXEDMOBILERadiolocation | Point to MultiPoint microwaveAeronautical mobile system | Non-commercial use |
| 1 452-1 492 MHz | 1 452-1 467 MHz FIXEDMOBILEBROADCASTINGBROADCASTING-SATELLITERadiolocation1 467-1 492 MHz FIXEDMOBILEBROADCASTING-SATELLITEBroadcastingRadiolocation | Point to MultiPoint microwaveBroadcasting satellite service (Trial)Aeronautical mobile system | Non-commercial use |
| 1 492-1 518 MHz | FIXEDMOBILERadiolocation | Point to MultiPoint microwaveAeronautical mobile system | Non-commercial use |
| 1 518-1 525/1 527 MHz | FIXEDMOBILEMobile-Satellite (space-to-Earth) Radiolocation | N/A | N/A |
| 1 695-1 700 MHz | METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE | CMAThere are hundreds of MetSat stations in Asia Pacific Area in the 1 695-1 710 MHz frequency band operated by almost all national meteorological services and many other users worldwide essential for providing operational and time-critical meteorological information. | There are several FENGYUN (FY) MetSat systems operating in the 1 695-1 710 MHz band in China currently, including polar-orbiting satellites such as FY-3A, FY-3B and FY-3C, and also geostationary satellites such as FY-2D, FY-2E and FY-2F; and the second generation FY geostationary meteorological satellites FY-4 series will continue to use this band. |
| 2 025-2 110 MHz | SPACE OPERATION (Earth-to-space) (space-to-space)EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space)SPACE RESEARCH (Earth-to-space) (space-to-space)FixedMobile | TT&C for Satellites, Space Ships, Space StationTT&C and DATA TRANSFER for Lunar Explorers | Commercial use and Non-commercial use Non-commercial use |
| 2 200-2 290 MHz | SPACE OPERATION (space-to-Earth) (space-to-space)EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)SPACE RESEARCH (space-to-Earth) (space-to-space)FixedMobile | TT&C for Satellites, Space Ships, Space StationTT&C and DATA TRANSFER for Lunar Explorers | Commercial use and Non-commercial use Non-commercial use |
| 2 700-2 900 MHz | AERONAUTICAL RADIONAVIGATIONRADIOLOCATION | Aeronautical radionavigation radarsGround-based meteorological radars | Non-commercial use |
| 2 900-3 100 MHz | RADIONAVIGATIONRADIOLOCATION | Radionavigation radarsGround-based meteorological radars | Non-commercial use2900-3100 MHz in use for Maritime radio navigation (S-band radar)Non-commercial use |
| 3 300-3 400 MHz | RADIOLOCATIONFIXEDMOBILERADIO ASTRONOMYAmateur | Radiolocation radarsRadio Astronomy | Non-commercial use |
| 3 400-3 600 MHz | 3 400-3 500 MHz FIXEDFIXED-SATELLITE (space-to-Earth)Amateur Mobile3 500-3 600 MHz FIXEDFIXED-SATELLITE (space-to-Earth)MOBILE except aeronautical mobile | Satellite communications | Commercial use/Non-commercial use |
| 3 600-3 800 MHz | 3 600-3 700 MHz FIXEDFIXED-SATELLITE (space-to-Earth)MOBILE except aeronautical mobile3 600-3 700 MHz FIXEDFIXED-SATELLITE (space-to-Earth)Mobile except aeronautical mobile | Satellite communications | Commercial use/Non-commercial use |
| 3 800-4 200 MHz | FIXEDFIXED-SATELLITE (space-to-Earth)Mobile except aeronautical mobile | Satellite communications | Commercial use/Non-commercial use |
| 4 400-4 500 MHz | FIXEDMOBILE | Point to Point microwaveAeronautical mobile system | Commercial use/Non-commercial use |
| 4 400-4 900 MHz | 4500-4800MHz FIXED FIXED-SATELLITE (space-to-Earth)MOBILE | Satellite communications(4500-4800MHz)Aeronautical mobile system | Commercial/Non-commercial use |
| 4 800-5 000 MHz | 4800-4990MHzFIXEDMOBILERADIO ASTRONOMY4990-5000MHzFIXEDMOBILE except aeronautical mobileRADIO ASTRONOMYSpace research (passive) | Point to Point microwaveAeronautical mobile systemRadio Astronomy | Commercial use/non- commercial use  |
| 5 350-5 470 MHz | 5 350-5 460 MHz EARTH EXPLORATION-SATELLITE (active)SPACE RESEARCH (active)AERONAUTICAL RADIONAVIGATIONRADIOLOCATION5 460-5 470 MHz RADIONAVIGATION EARTH EXPLORATION-SATELLITE (active)SPACE RESEARCH (active)RADIOLOCATION | AltimeterGround-based meteorological radarsWeather observation applicationsAeronautical radionavigation radars | Non-commercial use |
| 5 725-5 850 MHz | 5 725-5 830 MHz RADIOLOCATIONFIXEDMOBILEAmateur5 830-5 850 MHz RADIOLOCATIONFIXEDMOBILEAmateurAmateur-satellite (space-to-Earth) | Radiolocation radars | Non-commercial use |
| 5 850-5 925 MHz | FIXEDFIXED-SATELLITE (Earth-to-space)MOBILERADIOLOCATION | Satellite communicationsRadiolocation radars | Commercial use/Non-commercial use |
| 5 925-6 425 MHz | FIXEDMOBILEFIXED-SATELLITE (Earth-to-space) | Satellite communications | Commercial use/Non-commercial use |

## **Japan**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency Bands** | **Service****(Please indicate frequency range(s) for each service)** | **Applications** | **Status****(e.g. Commercial Operator/ License duration)** |
|
| 470--694/698 MHz | 470-710 MHzBROADCASTINGFIXEDLand Mobile ServiceBroadcasting | ISDB-T(470-710 MHz)Specified radio microphone (470-714 MHz) | About 12,000 transmitters for ISDB-T are in operation in the band 470-710MHzCommercial use. |
| 1 300-1 350 MHz,  | 1 300-1 350 MHz RADIOLOCATIONAERONAUTICAL RADIONAVIGATIONRADIONAVIGATION-SATELLITE (Earth-to-space) | Various radar systems (e.g. ARSR) | Non-commercial use |
| 1 350-1 375 MHz, 1 375-1 400 MHz, | 1 350 - 1 400 MHz RADIOLOCATION | Various radar systems  | Commercial/Non-commercial use. |
| 1 427-1 452 MHz | 1 427 - 1 429 MHz MOBILEFIXEDSPACE OPERATION (Earth-To-Space)1 429 - 1 453 MHz MOBILEFIXED | DC-HSDPA /LTE(1 427.9–1 510.9 MHz) | Commercial service provided by three operators. |
| 1 452-1 492 MHz, 1 492-1 518 MHz | 1 453-1 518 MHz MOBILEFIXED | DC-HSDPA /LTE(1 427.9–1 510.9 MHz) | Commercial service provided by three operators. |
| 1 518-1 525/1 527 MHz, | 1 518-1 525MHzMOBILEMOBILE-SATELLITE(Space-To-Earth) | Guard Band(1 518-1 525MHz) | N/A |
| 1 695-1 700 MHz  | 1 690-1 700 MHz METEOROLOGICAL AIDSMETEOROLOGICAL-SATELLITE (Space-To-Earth) | meteorological missions | Non-commercial use |
| 2 025-2 110 MHz,  | 2 025-2 110 MHzSPACE OPERATION (Earth-To-Space) (Space-To-Space), EARTH EXPLORATION-SATELLITE (Earth-To-Space) (Space-To-Space), MOBILE , SPACE RESEARCH (Earth-To-Space) (Space-To-Space) | Fixed Wireless Access Systems(rural)space mission | Commercial use in rural areasNon-commercial use  |
| 2 200-2 290 MHz  | 2 200-2 290 MHzSPACE OPERATION (Space-To-Earth) (Space-To-Space)EARTH EXPLORATION-SATELLITE (Space-To-Earth) (Space-To-Space)MOBILESPACE RESEARCH (Space-To-Earth) (Space-To-Space) | Fixed Wireless Access Systems(rural)space missions | Commercial use in rural areasNon-commercial use  |
| 2 700-2 900 MHz  | 2 700-2 900 MHzAERONAUTICAL RADIONAVIGATIONRadiolocation | Various radar systems ( e.g. ASR)  | Non-commercial use |
| 2 900-3 100 MHz  | 2 900-3 100 MHz RADIONAVIGATIONRADIOLOCATION | Various radar systems( e.g. marine radar) | Commercial/Non-commercial use |
| 3 300-3 400 MHz  | 3 300-3 400 MHz MOBILERADIOLOCATION | Various radar systems | Non-commercial use |
| 3 400-3 600 MHz  | 3 400-3 456 MHz FIXEDFIXED-SATELLITE (space-to-Earth)Mobile except aeronautical mobile3 456-3 600 MHzFIXED-SATELLITE (space-to-Earth)Mobile except aeronautical mobile, | ENG(3 400-3456 MHz)Satellite communications (downlink) (3 400-4 200 MHz | Commercial useCommercial/Non-commercial use |
| 3 600-3 800 MHz, 3 800-4 200 MHz  | 3 600-4 200 MHzFIXED-SATELLITE (space-to-Earth)Mobile | Satellite communications (downlink) (3 400-4 200 MHz) | Commercial/Non-commercial use  |
| 4 400-4 500 MHz  | 4 400-4 500 MHzMOBILE | N/A | No application is used in this band |
| 4 400-4 900 MHz  | 4 400-4 500 MHzMOBILE4 500-4 800MHzFIXED-SATELLITE (space-to-Earth)Mobile | N/A | No application is used in this band |
| 4 800-5 000 MHz | 4 800-5 000 MHzMOBILERadio astronomy | Wireless access system(IEEE 802.11j) (4 900-5 000 MHz) | Commercial use |
| 5 350-5 470 MHz | 5 350-5 470 MHzEARTH EXPLORAION-SATTELITE(active)RADIOLOCATIONAERONAUTICAL RADIONAVIGATIONSPACE RESEARCH(active) | Various radar systems (e.g meteorological radar (5 250 – 5 372.5 MHz)) | Non-Commercial use |
| 5 725-5 850 MHz  | 5 725-5 850 MHzMOBILE RADIOLOCATIONAmateur | DSRC(5 770 – 5 850 MHz)Amateur radio(5 650-5 850 MHz)Various radar systems | More than 57 million DSRC on-board unit has been shipped so far.Non-Commercial useNon-Commercial use |
| 5 850-5 925 MHz | 5 850-5 925 MHzFIXEDFIXED-SATELLITE(Earth-to-Space), MOBILE | ENG(5 850- 5 925MHz) | Commercial use |
| 5 925-6 425 MHz | 5 925-6 425 MHzFIXEDFIXED-SATELLITE(Earth-to-Space) | For satellite communications (uplink) (5925-6425MHz)Fixed Wireless Access Systems (Infrastructure networks) | Commercial/Non-commercial use Commercial use |

## **Republic of Korea**

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency Bands [MHz]** | **Service****(Please indicate frequency range(s) for each service)** | **Applications** | **Status****(e.g. Commercial Operator/ License duration** |
|
| 470-698 | BROADCASTING | TV Broadcasting Stations |  |
| Fixed |  |  |
| Mobile | Wireless microphone |  |
| 1 300-1 350 | AERONAUTICAL RADIONAVIGATION | Aeronautical Radionavigation Stations |  |
| RADIOLOCATION | Radiolocation Stations |  |
| RADIONAVIGATION SATELLITE (Earth-to-space) |  |  |
| 1 350-1 400 | RADIOLOCATION | Radiolocation Stations |  |
| 1 427-1 429 | FIXED | Fixed Stations |  |
| MOBILE except aeronautical mobile |  |  |
| SPACE OPERATION (Earth-to-space) |  |  |
| 1 429-1525 | FIXED | Fixed Stations |  |
| MOBILE | Maritime Mobile Stations |  |
| 1 690-1 700 | METEOROLOGICAL AIDS |  |  |
| METEOROLOGICAL SATELLITE (space-to-Earth) | Meteorological SatelliteEarth Station |  |
| 2 025-2 110 | EARTH EXPLORATION SATELLITE (Earth-to-space) (space-to-space) | Maritime and Meteorological Satellite  |  |
| MOBILE | Broadcasting Relay |  |
| SPACE OPERATION (Earth-to-space) (space-to-space) |  |  |
| SPACE RESEARCH (Earth-to-space) (space-to-space) | Earth StationSpace Station |  |
| 2 200-2 290 | EARTH EXPLORATION SATELLITE (space-to-Earth) (space-to-space) | Maritime and Meteorological Satellite  |  |
| FIXED | Fixed Stations |  |
| MOBILE |  |  |
| SPACE OPERATION (space-to-Earth) (space-to-space) |  |  |
| SPACE RESEARCH (space-to-Earth) (space-to-space) | Earth StationSpace Station  |  |
| 2 700-2 900 | AERONAUTICAL RADIONAVIGATION | Aeronautical Radionavigation Stations  |  |
| Radiolocation |  |  |
| 2 900-3 100 | RADIONAVIGATION | Radar BeaconMaritime Mobile Stations |  |
| Radiolocation |  |  |
| 3 300-3 400 | FIXED | Fixed Stations |  |
| MOBILE |  |  |
| RADIOLOCATION |  |  |
| 3 400-3 500 | FIXED | Fixed Stations |  |
| MOBILE except aeronautical mobile | Broadcasting Relay |  |
| RADIOLOCATION | Radiolocation Stations  |  |
| Amateur | 3450 MHz (Designated for Amateur) |  |
| 3 500-3 700 | FIXED | Fixed Stations |  |
| FIXED SATELLITE (space-to-Earth) |  |  |
| MOBILE except aeronautical mobile | Broadcasting Relay |  |
| 3 700-4 200 | FIXED |  Fixed M/W Stations |  |
| FIXED SATELLITE (space-to-Earth) | Earth Stations |  |
| 4 400-4 500 | FIXED | Fixed M/W Stations |  |
| MOBILE | Broadcasting Relay  |  |
| 4 500-4 800 | FIXED | Fixed M/W Stations |  |
| FIXED SATELLITE (space-to-Earth) |  |  |
| 4 800-4 990 | FIXED | Fixed M/W Stations |  |
| Radio astronomy |  |  |
| 4 990-5 000 | FIXED | Fixed M/W Stations |  |
| MOBILE except aeronautical mobile |  |  |
| RADIO ASTRONOMY |  |  |
| Space research |  |  |
| 5 350-5 460 | AERONAUTICAL RADIONAVIGATION | Aeronautical Meteorological Radar and Beacon |  |
| EARTH EXPLORATION SATELLITE (active) |  |  |
| Radiolocation |  |  |
| 5 460-5 470 | RADIONAVIGATION |  |  |
| Radiolocation |  |  |
| 5 725-5 850 | FIXED | Low power device for Data CommunicationFixed Stations |  |
| MOBILE | Dedicated Short Range CommunicationBroadcasting Relay |  |
| RADIOLOCATION | Radiolocation Stations |  |
| Amateur | 5750 MHz (Designated for Amateur Station) |  |
| 5 850-5 925 | FIXED | Fixed Stations |  |
| FIXED SATELLITE (Earth-to-space) | Earth Stations |  |
| MOBILE | Dedicated Short Range CommunicationBroadcasting Relay |  |
| Radiolocation |  |  |
| 5 925-6 700 | FIXED | Fixed M/W Stations |  |
| FIXED SATELLITE (Earth-to-space) |  |  |
| MOBILE |  |  |

## **New Zealand**

| **Frequency Bands**  | **Service****(Please indicate frequency range(s) for each service)** | **Applications** | **Status****(e.g. Commercial Operator/ License duration)** |
| --- | --- | --- | --- |
|
|  |
| 470 - 694/8 MHz | MOBILE (470 - 502 MHz) | Land mobile radio and telemetry systems | Currently in use by emergency service agencies and private/commercial land mobile operators |
| BROADCASTING (502 - 694 MHz) | Digital terrestrial television broadcasting (DVB-T) | Management Rights[[2]](#footnote-2) for broadcasting services expiring in 2033 |
| 1 300 - 1 400 MHz | AERONAUTICALRADIONAVIGATIONRADIOLOCATION | Primary surveillance radar | Currently in use for high power primary surveillance radar (e.g. 10 MW) within proximity to major airports |
| 1 427 - 1 525 MHz | FIXED(1 427 - 1 461.5 MHz) | Point-to-point/multipoint links for medium capacity backhaul and customer multi-access radio[[3]](#footnote-3) (CMAR) network | Currently in use by telecommunication infrastructure providers, emergency service agencies and utility companies in urban centers as well as in rural areas  |
| BROADCASTING  (1 461.5 - 1 490 MHz) | Terrestrial digital audio broadcasting (T-DAB) | Not in use |
| FIXED(1 490 – 1 525 MHz) | Point-to-point/multipoint links for medium capacity backhaul and customer multi-access radio (CMAR) network | Currently in use by telecommunication infrastructure providers, emergency service agencies and utility companies in urban centers as well as in rural areas  |
| 1 695 - 1 700 MHz | METEOROLOGICAL-SATELLITE (Space-to-Earth) | Meteorological polar-orbiting satellite  | Currently in use by New Zealand’s weather authority MetService |
| 2 025 - 2 110 MHz | MOBILE(2 025 - 2 082 MHz) | Broadband wireless access  | Management Rights for broadband wireless access expiring in 2021, but to date there is little use in this band |
| FIXED (2 082 - 2 110 MHz) | Point-to-multipoint links | Management Rights for fixed links expiring in 2021 |
| 2 200 - 2 290 MHz | MOBILE(2 200 - 2 265.5 MHz) | Broadband wireless access  | Management Rights for broadband wireless access expiring in 2021, but to date there is little use in this band |
| FIXED (2 265.5 - 2 300 MHz) | Point-to-multipoint links | Management Rights for fixed links expiring in 2021 |
| 2 700 - 2 900 MHz | AERONAUTICAL RADIONAVIGATIONRadiolocationFixed | Itinerant fixed linking for television outside broadcast operations | Currently in use nationwide by broadcasters and television outside broadcast operators |
| 2 900 - 3 100 MHz | RADIONAVIGATIONRADIOLOCATION | Maritime radiolocation/ radionavigation radar | Currently in use by oil & gas companies and also allowed for use on ships for radar under General User Licence[[4]](#footnote-4) (GUL) |
| 3 300 - 3 400 MHz | RADIOLOCATIONAmateur | Short range devices limited to radiolocation and amateur services | Allowed for use by short range devices and amateur radio operators under General User Licence (GUL) |
| 3 400 - 3 600 MHz | AMATEUR(3 400 - 3 410 MHz) | Amateur services  | Allowed for use by amateur radio operators under General User Licence (GUL) |
| FIXED & MOBILE(3 410 - 3 589 MHz) | Broadband wireless access | Management Rights for broadband wireless access expiring in 2022 |
| FIXED-SATELLITE (Space-to-Earth)(3 589 - 3 600 MHz) | C-band satellite downlink | Currently in use by C-band satellite users and operators |
| 3 600 - 4 200 MHz | FIXED-SATELLITE (Space-to-Earth) | C-band satellite downlink | Currently in use by C-band satellite users and operators |
| 4 400 - 5 000 MHz | FIXED | Point-to-point links | Currently heavily in use by telecommunication infrastructure providers |
| 5 350 - 5 470 MHz | AERONAUTICAL RADIONAVIGATION | Airborne weather radar | Allowed for use by aircraft for the purpose of radiodetermination transmission under General User Licence (GUL) |
| 5 725 - 6 725 MHz | ISM(5 725 - 5 875 MHz) | Short range devices including wireless local area networks and road transport/traffic telematics | Allowed for use by short range devices under General User Licence (GUL) |
| FIXED(5 925 - 6 725 MHz)  | Point-to-point links | Currently in use by telecommunication infrastructure providers and emergency service agencies |
| FIXED-SATELLITE (Earth-to-space)(5 850 - 6 725 MHz) | C-band satellite uplink | Currently in use by C-band satellite users and operators |

## Thailand

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency Bands**  | **Service****(Please indicate frequency range(s) for each service)** | **Applications** | **Status****(e.g. Commercial Operator/ License duration)** |
| 470-694/698 MHz | Land mobile(470-510 MHz) | Conventional | Non Commercial |
| Trunked Radio  |  |
| Pager  |  |
| Common Base Radio Telephone  | Commercial Operator  |
| Fixed (470-510 MHz)  | Voice & Data Link  |   |
| Broadcasting (510-790 MHz)  | Televisions  | Commercial Operator  |
| 1 300-1 350 MHz  | Aeronautical radionavigation  | Radar  | Non Commercial  |
| 1 350-1 375 MHz  | Aeronautical radionavigation  | Radar  |   |
| 1 375-1 400 MHz  |   |   |   |
| 1 427-1 452 MHz  | Fixed Fixed/ 1428.75-1475 MHz and 1477.75-1542 MHz  | Voice & Data Link Public Phone    | Non Commercial TOT Public Company Limited  |
| 1 452-1 492 MHz  |
| 1 492-1 518 MHz  |
| 1 518-1 527 MHz  |
| 1 695-1 700 MHz  | Fixed-Satellite  | Meteorological  | Non Commercial  |
| 2 025-2 110 MHz  | Fixed Earth Explolation Satellite  | Voice & Data Link Earth Exploler  | Non Commercial  |
| 2 200-2 290 MHz  | Fixed Earth Explolation Satellite  | Voice & Data Link Earth Exploler  | Non Commercial  |
| 2 700-2 900 MHz  | Aeronautical Radionavigation Radiolocation  | Radar  | Non Commercial  |
| 2 900-3 100 MHz  | Radionavigation  | Radar Beacon  | Non Commercial  |
| 3 300-3 400 MHz  |   |   |   |
| 3 400-3 600 MHz | Fixed-Satellite  | Voice & Data Link  | Non Commercial  |
| 3 800-4 200 MHz  | Fixed-Satellite  | Voice & Data Link  | Non Commercial  |
| 4 400-4 500 MHz  | Fixed  | Voice & Data Link  | Non Commercial  |
| 4 500-4 900 MHz  | Fixed  | Voice & Data Link  | Non Commercial  |
| 4 800-5 000 MHz  | Fixed  | Voice & Data Link  | Non Commercial  |
| 5 350-5 470 MHz  | Radiolocation  | Radar  | Non Commercial  |
| 5 725-5 850 MHz  | Fixed  | Voice & Data Link  | Non Commercial  |
| Mobile  | Electronic Toll Collection System  |
| Radiolocation  | Radar  |
| 5 850-5 925 MHz  |  Fixed-Satellite Radiolocation  | Voice & Data Link Radar  | Non Commercial  |
| 5 925-6 425 MHz  | Fixed Fixed-Satellite  | Voice & Data Link  | Non Commercial  |

# System characteristics for consideration in sharing/compatibility studies in the bands

## Australia

|  |  |  |
| --- | --- | --- |
| **Frequency Bands** | **Applications** | **System Characteristics** |
|
| 470-520 MHz | Narrowband land mobile | System model and receiver protection requirements in RALI LM 8. |
| Narrowband fixed point-to-multipoint systems | System model and receiver protection requirements in RALI FX 16. |
| Narrowband fixed point-to-point links | Receiver protection requirements in RALI FX 17. |
| Wideband fixed receivers | Receiver protection requirements in RALI FX 1. |
| 520-694 MHz | DTTB | Planning and protection criteria in DTTB Planning Handbook, March 2005. |
| 1 300-1 400 MHz | Radioastronomy receivers | Protection requirements in RALI MS 31. |
| 1 427-1 452 MHz | Fixed point-to-point and point-to-multipoint systems | Protection requirements in RALI FX 3—see Appendices 1 and 8.Unwanted emission recommended maximum levels according to Resolution 750 (Rev. WRC-12). |
| 1 452-1 492 MHz | Fixed point-to-point and point-to-multipoint systems | Protection requirements in RALI FX 3—see Appendices 1 and 8. |
| 1 492-1 518 MHz |
| 1 518-1 525 MHz |
| 1 427-1 525 MHz | Radio astronomy receivers | Protection requirements in RALI MS 31. |
| 2 025-2110 MHz | TVOB | Some system characteristics in RALI FX 21. |
| 2 200-2 290 MHz | TVOB | Some system characteristics in RALI FX 21. |
| 2 700-2 900 MHz | IMT | Some IMT characteristics in RALI MS 35 (including 2.5 GHz IMT maximum equivalent isotropically radiated power (EIRP), out-of-band (OOB) emission limit). |
| Aeronautical radionavigation service (ARNS) radars | Defence radar protection requirement in RALI MS 35. |
| 3 400-3 600 MHz | FWA | Some system characteristics in *Radiocommunications (Spectrum Marketing Plan—3.4 GHz Band) 2000* and *Radiocommunications Advisory Guidelines (Managing Out-of-band Interference in Receivers Operating in Spectrum Licensed Space—3.4 GHz Band) 2000*. |
| FWA | System model and protection requirements in RALI FX 14. |
| BWA | System model and protection requirements in RALI FX 19. |
| Fixed point-to-point systems | Protection requirements in RALI FX 3—see Appendix 1. |
| 3 600-3 800 MHz and 3 800-4 200 MHz | BWA | System model and protection requirements in RALI FX 19.System characteristics for consideration of sharing with FSS Earth stations reflected in Report ITU-R M.2199 (Annex D). |
| Fixed point-to-point systems | Protection requirements in RALI FX 3—see Appendix 1. |
| Fixed-satellite service (FSS) Earth stations | Protection requirements in RALI FX 19—see Attachment 2d. |
| 4 800-5 000 MHz | Broadband PPDR systems | Some system characteristics in *Radiocommunications (Public Safety and Emergency Response) Class Licence 2013.* |
| Radio astronomy receivers | Protection requirements in *Radiocommunications (Public Safety and Emergency Response) Class Licence 2013*. |
| 5 350-5 470 MHz | Tank level probing radar (TLPR) | Some system characteristics in *Radiocommunications (Low Interference Potential Devices) Class Licence 2000* and technical characteristics in ETSI EN 302 372-1 |
| 5 725-5 850 MHz | Fixed point-to-point systems | Some system characteristics in: <http://www.acma.gov.au/theACMA/radiofrequency-spectrum-fixed-licences#7>  |
| Short range devices | Some system characteristics in *Radiocommunications (Low Interference Potential Devices) Class Licence 2000* |
| 5 850-5 925 MHz | Fixed point-to-point systems | Protection requirements in RALI FX 3—see Appendix 1. |
| Short range devices | Some system characteristics in *Radiocommunications (Low Interference Potential Devices) Class Licence 2000* |
| 5 925-6 700 MHz | Fixed point-to-point systems | Protection requirements in RALI FX 3—see Appendix 1. |

## Bangladesh

|  |  |  |
| --- | --- | --- |
| **Frequency Bands** | **Applications** | **System Characteristics** |
|
| 825-845/870-890  | CDMA | RR/ NFAP |
| E-GSM | RR/ NFAP |
| PSTN | RR/ NFAP |
| 890-925/935-960 | GSM | RR/ NFAP |
| 1710-1785/1805-1880 | GSM | RR/ NFAP |
| 1920-1980/2110-2170 | UMTS | RR/ NFAP |
| 2300-2400 | TD-LTE | RR/ NFAP |
| 2500-2690 | LTE, TD-LTE | RR/ NFAP |
| 3400-3500/3500-3600 | FWA | RR/ NFAP |

## China

|  |  |  |  |
| --- | --- | --- | --- |
| **Frequency Bands** | **Service****(Please indicate frequency range(s) for each service)** | **Applications** | **System Characteristics** |
| 470-694/698 MHz | BROADCASTING | Free public services | Analogue system: PAL-DDigital system: DTMB |
| 1 300-1 350 MHz | AERONAUTICAL RADIONAVIGATION RADIOLOCATIONRADIO NAVIGATION-SATELLITE (Earth-to-space) | Primary surveillance radars | Rec. ITU-R M.1463;Rec. ITU-R M.1584MH/T 4038-2013 L band primary surveillance radar for ATC-Technical requirement |
| 1 350-1 400 MHz | RADIOLOCATIONRADIO ASTRONOMY | Radio Astronomy Radiolocation radars | Rec. ITU-R RA.769Rec. ITU-R M.1463;Rec. ITU-R M.1584MH/T 4038-2013 L band primary surveillance radar for ATC-Technical requirement |
| 1 427-1 452 MHz | FIXEDMOBILERadiolocation | Point to MultiPoint microwaveAeronautical mobile system | Rec. ITU-R F.758 |
| 1 452-1 492 MHz | 1 452-1 467 MHz FIXEDMOBILEBROADCASTINGBROADCASTING-SATELLITERadiolocation1 467-1 492 MHz FIXEDMOBILEBROADCASTING-SATELLITEBroadcastingRadiolocation | Point to MultiPoint microwaveBroadcasting satellite serviceAeronautical mobile system | Rec. ITU-R F.758Rec. ITU-R BO.1504Rec. ITU-R BO.1130Document 4-5-6-7/581 |
| 1 492-1 518 MHz | FIXEDMOBILERadiolocation | Point to MultiPoint microwaveAeronautical mobile system | Rec. ITU-R F.758 |
| 1 518-1 525/1 527 MHz | FIXEDMOBILEMobile-Satellite (space-to-Earth) Radiolocation | Mobile satellite service | Document 4-5-6-7/393 Annex 2Attachment 3 |
| 1 695-1 700 MHz | METEOROLOGICAL AIDS METEOROLOGICAL SATELLITE | CMA | JTG4-5-6-7 document 482 |
| 2 025-2 110 MHz | SPACE OPERATION (Earth-to-space) (space-to-space)EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space)SPACE RESEARCH (Earth-to-space) (space-to-space)FixedMobile | TT&C fo Satellites, Space Ships, Space StationTT&C and DATA TRANSFER for Lunar Explorers | Antenna Diameter:φ5m, φ10m, φ12m, φ15mAntenna Diameter:φ18m, φ26m,φ35m, φ50m,φ65m |
| 2 200-2 290 MHz | SPACE OPERATION (space-to-Earth) (space-to-space)EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)SPACE RESEARCH (space-to-Earth) (space-to-space)FixedMobile | TT&C fo Satellites, Space Ships, Space StationTT&C and DATA TRANSFER for Lunar Explorers | Antenna Diameter:φ5m, φ10m, φ12m, φ15mAntenna Diameter:φ18m, φ26m,φ35m, φ50m,φ65m |
| 2 700-2 900 MHz | AERONAUTICAL RADIONAVIGATIONRADIOLOCATION | Ground-based meteorological radars Aeronautical radionavigation radar | Rec. ITU-R M.1849ICAO SARPs: Annex 10, Volume I, paragraph 3.2.4;Rec. ITU-R M.629;Rec. ITU-R M.1460;Rec. ITU-R M.1461;Rec. ITU-R M.1464;Rec. ITU-R M.1465;MH/T 4017-2004 S band primary surveillance radar technical specification for ATC |
| 2 900-3 100 MHz | RADIONAVIGATIONRADIOLOCATION | Ground-based meteorological radars Radionavigation radar | Rec. ITU-R M.1849ICAO SARPs: Annex 10, Volume I, paragraph 3.2.4;Rec. ITU-R M.629;Rec. ITU-R M.1460;Rec. ITU-R M.1461;Rec. ITU-R M.1464;Rec. ITU-R M.1465;MH/T 4017-2004 S band primary surveillance radar technical specification for ATC |
| 3 300-3 400 MHz | RADIOLOCATIONFIXEDMOBILERADIO ASTRONOMYAmateur | Radiolocation radarRadio Astronomy | Rec. ITU-R M.1465Rec. ITU-R RA.769 |
| 3 400-3 600 MHz | 3 400-3 500 MHz FIXEDFIXED-SATELLITE (space-to-Earth)Amateur Mobile3 500-3 600 MHz FIXEDFIXED-SATELLITE (space-to-Earth)MOBILE except aeronautical mobile |  |  |
| 3 600-3 800 MHz | 3 600-3 700 MHz FIXEDFIXED-SATELLITE (space-to-Earth)MOBILE except aeronautical mobile3 600-3 700 MHz FIXEDFIXED-SATELLITE (space-to-Earth)Mobile except aeronautical mobile | Satellite communications | Report ITU-R M.2109;Document 4-5-6-7/393 Annex 2 Attachment 3 |
| 3 800-4 200 MHz | FIXEDFIXED-SATELLITE (space-to-Earth)Mobile except aeronautical mobile | Satellite communications | Report ITU-R M.2109;Document 4-5-6-7/393 Annex 2 Attachment 3 |
| 4 400-4 500 MHz | FIXEDMOBILE | Point to Point microwaveAeronautical mobile system | Rec. ITU-R F.758 |
| 4 400-4 900 MHz | 4500-4800MHz FIXED FIXED-SATELLITE (space-to-Earth)MOBILE | Satellite communications (4500-4800 MHz)Aeronautical mobile system | Document 4-5-6-7/393 Annex 2 Attachment 3Report ITU-R M.2109 |
| 4 800-5 000 MHz | 4800-4990MHzFIXEDMOBILERADIO ASTRONOMY4990-5000MHzFIXEDMOBILE except aeronautical mobileRADIO ASTRONOMYSpace research (passive) | Point to Point microwaveRadio AstronomyAeronautical mobile system | Rec. ITU-R F.758Rec. ITU-R RA.769 |
| 5 350-5 470 MHz | 5 350-5 460 MHz EARTH EXPLORATION-SATELLITE (active)SPACE RESEARCH (active)AERONAUTICAL RADIONAVIGATIONRADIOLOCATION5 460-5 470 MHz RADIONAVIGATION EARTH EXPLORATION-SATELLITE (active)SPACE RESEARCH (active)RADIOLOCATION | AltimeterGround-based meteorological radarsAeronautical radionavigation radars | Rec. ITU-R RS.1166ICAO SARPs: Annex 10, Volume I, Chapter 3, 3.11;ICAO Annex 10, Volume I, Table A;ICAO Annex 10, Volume V, Chapter 4, 4.4;ICAO Annex 10, Volume I, Attachment G, Section 9;Rec. ITU-R S.1342;Rec. ITU-R M.1582;MH/T 4016.5-2008 Civil aviation meteorology-Part 5: Equipment technical requirementRec. ITU-R M.1849 |
| 5 725-5 850 MHz | 5 725-5 830 MHz RADIOLOCATIONFIXEDMOBILEAmateur5 830-5 850 MHz RADIOLOCATIONFIXEDMOBILEAmateurAmateur-satellite (space-to-Earth) | Radiolocation radarsWireless access systems | Rec. ITU-R M.1638 |
| 5 850-5 925 MHz | FIXEDFIXED-SATELLITE (Earth-to-space)MOBILERADIOLOCATION | Satellite communicationsRadiolocation radars | Document 4-5-6-7/393 Annex 2 Attachment 3Rec. ITU-R M.1638 |
| 5 925-6 425 MHz | FIXEDMOBILEFIXED-SATELLITE (Earth-to-space) | Satellite communications | Document 4-5-6-7/393 Annex 2 Attachment 3 |

## Japan

|  |  |  |
| --- | --- | --- |
| **Frequency Bands** | **Applications** | **System Characteristics** |
|
| 1 300-1 350 MHz | ARSR | Recommendation ITU-R M.1463 |
| 2 025-2 110 MHz | Fixed Wireless Access Systems | Occupied bandwidth : ≤ 4MHzAntenna power : ≦5W |
| 2 700-2 900 MHz | ASR | Recommendation ITU-R M.1461, Recommendation ITU-R M.1464 |
| 2 200-2 290 MHz | Fixed Wireless Access Systems | Occupied bandwidth : ≤ 4MHzAntenna power : ≦ 5W |
| 3 400-3 600 MHz | Satellite communications (downlink) (3 400-4 200 MHz) | Report ITU-R S.2199 Report ITU-R M.2109JTG 4-5-6-7:Document 4-5-6-7/715 Annex 2 Attachment 3 |
| 3 600-3 800 MHz | Satellite communications (downlink) (3 400-4 200 MHz) | Report ITU-R S.2199 Report ITU-R M.2109JTG 4-5-6-7:Document 4-5-6-7/715 Annex 2 Attachment 3 |
| 3 800-4 200 MHz | Satellite communications (downlink) (3 400-4 200 MHz) | Report ITU-R S.2199 Report ITU-R M.2109JTG 4-5-6-7:Document 4-5-6-7/715 Annex 2 Attachment 3 |
| 4 800-5 000 MHz | Wireless Access System (4 900-5 000 MHz) | Specified in IEEE 802.11j as followsOccupied bandwidth : ≤ 40MHzAntenna power : ≦ 250mWAntenna gain: ≤ 13dBi |
| 5 350-5 470 MHz | Meteorological radar (5 250 – 5372.5 MHz) | Occupied bandwidth : ≤ 4.4MHzAntenna power : ≦ 250kW |
| 5 770-5 850 MHz  | DSRC | Specified in ARIB STD-T75 as followsOccupied bandwidth : ≤ 4.4MHzCenter frequency (BS): 5775, 5780,5785, 5790, 5795, 5800, 5805 MHzCenter frequency (MS) 5815, 5820, 5825,5830,5835, 5840, 5845 MHzAntenna power: ≤300mW(BS), ≤10mW(MS)Antenna gain: ≤20dBi(BS), ≤10dBi(MS)Modulation method: ASK, /4 shift-QPSKChannel access method:TDMA-FDD |
| 5 925-6 425 MHz | For satellite communications (uplink) (5925-6425MHz)Fixed Wireless Access Systems (Infrastructure networks) | JTG 4-5-6-7:Document 4-5-6-7/715 Annex 2 Attachment 3Occupied bandwidth : ≤ 53.5MHzAntenna power : ≤ 4W |

## Republic of Korea

TheRepublic of Korea supports system characteristics for sharing/compatibility studies of ITU-R JTG 4-5-6-7 in the bands listed in section 4.5.

## New Zealand

Providing this answer **does not necessarily** mean that New Zealand is proposing for all of the following frequency bands as suitable frequency ranges in relation to WRC-15 Agenda item 1.1, subject to sharing/compatibility studies:

|  |  |  |
| --- | --- | --- |
| **Frequency Bands** | **Applications** | **System Characteristics** |
|
| 1 300 - 1 400 MHz | Primary surveillance radar | Recommendation ITU-R М.1463 |
| 1 427 - 1 461.5 MHz / 1 490 - 1 525 MHz | Point-to-point/multipoint links for medium capacity backhaul and customer multi-access radio (CMAR) network | ETSI EN 301 055[[5]](#footnote-5)ETSI EN 300 636[[6]](#footnote-6) |
| 2 025 - 2 110 MHz | Broadband wireless access | 3GPP 25.102 (TDD UTRA)3GPP 25.105 (TDD UTRA) |
| Point-to-multipoint links | ETSI EN 301 055ETSI EN 300 636 |
| 2 200 - 2 290 MHz | Broadband wireless access  | TBD |
| Point-to-multipoint links | ETSI EN 301 055ETSI EN 300 636 |
| 3 400 - 3 600 MHz | Broadband wireless access | ETSI EN 301 021[[7]](#footnote-7) (TDMA)ETSI EN 302 326[[8]](#footnote-8) andETSI EN 301 753[[9]](#footnote-9) (WiMAX technology)  |

# Sharing/compatibility studies in the bands

## Australia

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Frequency Bands** | **Sub-bands** | **Existing studies in your country** | **Current status of studies in your country** | **Results of sharing/compatibility studies in your country (Please enclose your study reports if available)** | **ITU-R Report /Recommendation taken into account** |
| 1 350-1 400 MHz | Yes | On-going | Document 4-5-6-7/420—*Sharing/compatibility studies of IMT systems with radiolocation systems in the frequency band 1 300-1 400 MHz* | ITU-R ReportsM.2039 (IMT-2000 characteristics)ITU-R RecommendationsF.1336-3 (IMT base station antennas)M.1461-1 (considerations on protection criteria and propagation model)M.1463-2 (radar characteristics and protection criteria in 1 215-1 400 MHz)P.528 (propagation model) |
| 1 300-1 400 MHz | Yes | Complete | Notification zones around radioastronomy facilities in RALI MS 31. | ITU-R RecommendationsP.526 (propagation model) |
| 1 427-1 525 MHz |
| 2 700-2 900 MHz | Yes | On-going | Document 4-5-6-7/419—*Studies on the impact of IMT interference on radar systems with pulse compression operating in the frequency range 2 700-3 100 MHz* | ITU-R ReportsM.2112 (radar and IMT sharing study)ITU-R RecommendationsM.1464 (radar characteristics and protection criteria in 2 700-2 900 MHz)M.1461 (radar selectivity mask)M.1541-2 (radar OOB emissions)F.1336 (IMT base station antenna) |
| 3 300-3 400 MHz | Yes | On-going | Document 4-5-6-7/421—*Sharing studies between indoor IMT systems and radar systems in the frequency band 3 300-3 400 MHz for WRC-15 Agenda item 1.1* | ITU-R ReportsM.2111 (radar and IMT sharing study)ITU-R RecommendationsF.1336 (IMT base station antenna)M.1465 (radar characteristics and protection criteria in 3 100-3 700 MHz)P.452 (propagation model, clutter loss)P.525 (propagation model)P.528 (propagation model)P.1812 (building loss)P.1238 (building loss between multiple floors) |
| 3 400-3 700 MHz |  |  | Coordination requirements in RALI FX 19 | ITU-R ReportsS.2199 (BWA/FSS sharing study)M.2039 (IMT-2000 characteristics)M.2116 (BWA characteristics)ITU-R RecommendationsSF.1006 (FSS earth station protection requirements)S.1432-1 (FSS earth station protection requirements)S.465-5 (FSS earth station antenna)P.452 (propagation model) |
| 4 400-5 000 MHz | Yes | Complete | Notification zones around radioastronomy facilities in RALI MS 31. | ITU-R RecommendationsP.526 (propagation model) |
| 5 350-5 470 MHz |
| 5 725-6 700 MHz |
| 5 850-5 925 MHz | Yes | Ongoing | SPP 2006/09—Intelligent Transport Systems (ITS) | ITU-R RecommendationsM.1453 (ITS technical characteristics) |

## Bangladesh

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Frequency Bands****(MHz)** | **Sub-bands** | **Existing sharing/compatibility studies in your country? (Yes/No)** | **Current status of sharing/compatibility studies in your country****(Complete/On-going)** | **Results of sharing/compatibility studies in your country (Please enclose your study reports if available)** | **ITU-R Report /Recommendation taken into account** |
| 450-470 | 450-460/460-470 | No | Ongoing | N/A | RR |
| 698-806 | 698-803 | No | Ongoing | N/A | RR |
| 1710-1880 | 1710-1785/1805-1880 | No | Ongoing | N/A | RR |
| 1900-2100 | 1920-1980/2110-2170 | No | Ongoing | N/A | RR |
| 2300-2400 | 2300-2400 | No | Ongoing | N/A | RR |
| 2500-2600 | 2510-2570/2620-2690 | No | Ongoing | N/A | RR |
| 2570-2620 | No | Ongoing | N/A | RR |

## China

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Frequency Bands** | **Sub-bands** | **Existing sharing/compatibility studies in your country? (Yes/No)** | **Current status of sharing/compatibility studies in your country****(Complete/On-going)** | **Results of sharing/compatibility studies in your country (Please enclose your study reports if available)** | **ITU-R Report /Recommendation taken into account** |
| 470-694/698 MHz | 470-694/698 MHz | Yes | Ongoing |  |  |
| 1 427-1 452 MHz | 1 427-1 452 MHz | Yes | Ongoing | JTG4-5-6-7 document 4-5-6-7/[284](http://www.itu.int/md/R12-JTG4567-C-0284/en) |  |
| 1 452-1 492 MHz | 1 452-1 492 MHz | Yes | Ongoing | JTG4-5-6-7 document 4-5-6-7/[283](http://www.itu.int/md/R12-JTG4567-C-0283/en), [284](http://www.itu.int/md/R12-JTG4567-C-0284/en) |  |
| 1 492-1 518 MHz | 1 492-1 518 MHz | Yes | Ongoing | JTG4-5-6-7 document 4-5-6-7/[284](http://www.itu.int/md/R12-JTG4567-C-0284/en) |  |
| 1 695-1 700 MHz | 1 695-1 710 MHz | Yes | complete | Sharing/compatibility with IMT is not feasible |  |
| 3 300-3 400 MHz | 3 300-3 400 MHz | Yes | complete | JTG4-5-6-7 document 4-5-6-7/[483](http://www.itu.int/md/R12-JTG4567-C-0483/en), [486](http://www.itu.int/md/R12-JTG4567-C-0486/en) |  |
| 3 600-3 800 MHz3 800-4 200 MHz | 3 600-4 200 MHz | Yes | Ongoing |  |  |
| 4 400-4 500 MHz | 4 400-4 500 MHz | Yes | Ongoing | JTG4-5-6-7 document 4-5-6-7/[483](http://www.itu.int/md/R12-JTG4567-C-0483/en), [484](http://www.itu.int/md/R12-JTG4567-C-0484/en), [485](http://www.itu.int/md/R12-JTG4567-C-0485/en), [653](http://www.itu.int/md/R12-JTG4567-C-0653/en)Need to consider compatibility between radio altimeters in 4200-4400MHz and IMT in 4400-4500MHz |  |
| 4 400-4 900 MHz | 4 500-4 800 MHz | Yes | Ongoing |  |  |
| 4 800-5 000 MHz | 4 800-4 990 MHz | Yes | Ongoing | JTG4-5-6-7 document 4-5-6-7/[483](http://www.itu.int/md/R12-JTG4567-C-0483/en), [484](http://www.itu.int/md/R12-JTG4567-C-0484/en), [485](http://www.itu.int/md/R12-JTG4567-C-0485/en), [653](http://www.itu.int/md/R12-JTG4567-C-0653/en) |  |
| 5 350-5 470 MHz | 5 350-5 470 MHz | No | Ongoing |  | Rec. ITU-R M.1464-1Rep. ITU-R M.2112 |
| 5 850-5 925 MHz | 5 850-5 925 MHz | Yes | Ongoing |  |  |
| 5 925-6 425 MHz | 5 925-6 425 MHz | Yes | Ongoing |  |  |

## Japan

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Frequency Bands** | **Sub-bands** | **Existing sharing/compatibility studies in your country? (Yes/No)** | **Current status of sharing/compatibility studies in your country****(Complete/On-going)** | **Results of sharing/compatibility studies in your country (Please enclose your study reports if available)** | **ITU-R Report /Recommendation taken into account** |
| 470-694/698 MHz |  | Yes | Complete | Sharing of broadcasting and IMT is not possible without using appropriate size of guard band and mitigation techniques. | Report ITU-R BT.2247-2 |
| 1 427-1 452 MHz, 1 452-1 492 MHz, 1 492-1 518 MHz | 1 427.9 - 1 510.9 MHz | Yes | For ITU-R JTG 4-5-6-7 studies, several input documents were submitted.It should be noted that the bands have been already used for IMT in Japan. | Following input documents were submitted to ITU-R JTG 4-5-6-7:Document 4-5-6-7/[262](http://www.itu.int/md/R12-JTG4567-C-0262/en), [263](http://www.itu.int/md/R12-JTG4567-C-0263/en), [265](http://www.itu.int/md/R12-JTG4567-C-0265/en), [403](http://www.itu.int/md/R12-JTG4567-C-0403/en), [404](http://www.itu.int/md/R12-JTG4567-C-0404/en), [408](http://www.itu.int/md/R12-JTG4567-C-0408/en), [625](http://www.itu.int/md/R12-JTG4567-C-0625/en) | See details in the input documents to ITU-R JTG 4-5-6-7 |
| 3 400-3 600 MHz | 3 400-3 600 MHz | Yes | For ITU-R JTG 4-5-6-7 studies, several input documents were submitted. | Following input documents were submitted to ITU-R JTG 4-5-6-7: Document 4-5-6-7/[144](http://www.itu.int/md/R12-JTG4567-C-0144/en), [259](http://www.itu.int/md/R12-JTG4567-C-0259/en), [260](http://www.itu.int/md/R12-JTG4567-C-0260/en), [266](http://www.itu.int/md/R12-JTG4567-C-0266/en), [406](http://www.itu.int/md/R12-JTG4567-C-0406/en), [409](http://www.itu.int/md/R12-JTG4567-C-0409/en), [627](http://www.itu.int/md/R12-JTG4567-C-0627/en) | See details in the input documents to ITU-R JTG 4-5-6-7 |
| 3 600-4 200 MHz | 3 600-4 200 MHz | Yes |  For ITU-R JTG 4-5-6-7 studies, several input documents were submitted. |  Following input documents were submitted to ITU-R JTG 4-5-6-7:Document 4-5-6-7/[259](http://www.itu.int/md/R12-JTG4567-C-0259/en), [260](http://www.itu.int/md/R12-JTG4567-C-0260/en), [266](http://www.itu.int/md/R12-JTG4567-C-0266/en), [406](http://www.itu.int/md/R12-JTG4567-C-0406/en), [409](http://www.itu.int/md/R12-JTG4567-C-0409/en), [627](http://www.itu.int/md/R12-JTG4567-C-0627/en) | See details in the input documents to ITU-R JTG 4-5-6-7 |
| 4 400-4 900 MHz | 4 400-4 900 MHz | Yes | For ITU-R JTG 4-5-6-7 studies, several input documents were submitted. | Following input document was submitted to ITU-R JTG 4-5-6-7: Document 4-5-6-7/[259](http://www.itu.int/md/R12-JTG4567-C-0259/en), [627](http://www.itu.int/md/R12-JTG4567-C-0627/en) | See details in the input document to ITU-R JTG 4-5-6-7 |
| 4 500-4 800 MHz | Yes | For ITU-R JTG 4-5-6-7 studies, several input documents were submitted. | Following input document was submitted to ITU-R JTG 4-5-6-7: Document 4-5-6-7/[260](http://www.itu.int/md/R12-JTG4567-C-0260/en), [409](http://www.itu.int/md/R12-JTG4567-C-0409/en), [627](http://www.itu.int/md/R12-JTG4567-C-0627/en)  | See details in the input document to ITU-R JTG 4-5-6-7 |

## Republic of Korea

TheRepublic of Korea supports sharing/compatibility studies within ITU-R in the bands listed in section 4.5.

## New Zealand

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Frequency Bands** | **Sub-bands** | **Existing sharing/compatibility studies in your country? (Yes/No)** | **Current status of sharing/compatibility studies in your country****(Complete/On-going)** | **Results of sharing/compatibility studies in your country (Please enclose your study reports if available)** | **ITU-R Report /Recommendation taken into account** |
| 1 300 - 1400 MHz | 1 300 - 1 350 MHz | No | Not commenced | No intention for co-frequency sharing with IMT systems | N/A |
| 1 350 - 1 400 MHz | No | Not commenced | TBD | N/A |
| 1 427 - 1 525 MHz | 1 427 - 1 461.5 MHz | No | Not commenced | TBD | N/A |
| 1 461.5 - 1 490 MHz | No | Ongoing | TBD | N/A |
| 1 490 - 1 525 MHz | No | Not commenced | TBD | N/A |
| 2 025 - 2 110 MHz | 2 025 - 2 110 MHz | No | Not commenced | TBD | N/A |
| 2 200 - 2 290 MHz | 2 200 - 2 290 MHz | No | Not commenced | TBD | N/A |
| 3 400 - 3 600 MHz | 3 410 - 3 487 MHz  | Yes | Completed | Currently allocated for use by broadband wireless access system based on FDD mode in7 MHz raster | N/A |
| 3 510 - 3 587 MHz | Yes | Completed |

# APT member’s future plan in the bands

## Australia

|  |  |  |
| --- | --- | --- |
| **Frequency Bands** | **Planned/Future services and applications**  | **Timeline** |
|
| 520-694 MHz | DTTB | Services being restacked from above 694 MHz by 2015 |
| 1 300-1 350 MHz | Aero radar, AMT | Current‑use expected to increase towards 2017 |
| 1 350-1 400 MHz |
| 1 427-1 452 MHz | - |  |
| 1 452-1 492 MHz | - |  |
| 1 492-1 518 MHz | - |  |
| 1 518-1 525 MHz | - |  |
| 1 695-1 700 MHz | - |  |
| 2 025-2 110 MHz | Migration of TVOB services from the 2.5 GHz bandAMT | TVOB re-allocation period by 31 January 2016Current‑use expected to increase towards 2017 |
| 2 200-2 290 MHz |
| 2 700-2 900 MHz | - |  |
| 2 900-3 100 MHz | - |  |
| 3 300-3 400 MHz | - |  |
| 3 400-3 600 MHz | Wireless access services (WAS) | Current—use expected to increase |
| 3 600-3 700 MHz |
| 3 700-3 800 MHz | - |  |
| 3 800-4 200 MHz | - |  |
| 4 400-4 500 MHz | - |  |
| 4 500-4 800 MHz | - |  |
| 4 800-5 000 MHz | PPDR 4.9 GHz | Current—use expected to increase |
| 5 350-5 470 MHz | - |  |
| 5 725-5 850 MHz | Radio local area network (RLAN) | Current—use expected to increase |
| 5 850-5 925 MHz | Potentially for ITS | Unknown |
| 5 925-6 425 MHz | - |  |

## Bangladesh

|  |  |  |
| --- | --- | --- |
| **Frequency Bands****(MHz)** | **Planned/Future services and applications**  | **Timeline** |
|
| 698-806 | Mobile ,LTE | 2015 |
| 1710-1880 | Mobile ,LTE | 2015 |
| 450-470 | Mobile, LTE | 2017 |
| 2500-2690 | BWA, LTE | 2015 |
| 2300-2400 | BWA, TD-LTE | 2015 |

## China

Current usage listed in section 4.3 is expected to continue in long term.

## Japan

Japan updates Frequency reallocation Action Plan every year, the latest version explains that the following bands are necessary for IMT.

|  |  |  |
| --- | --- | --- |
| **Frequency Bands** | **Planned/Future services and applications**  | **Timeline** |
|
| 3 400-3 600 MHz | IMT-Advanced | by around 2015 |
| 3 600-4 200 MHz | IMT-Advanced | TBD |
| 4 400-4 900 MHz | IMT-Advanced | TBD |

## Republic of Korea

The Republic of Korea may consider the use of IMT in the bands identified at WRC-15 and existing services would be continuously operated and further developed in the bands other than identified bands for IMT.

## New Zealand

|  |  |  |
| --- | --- | --- |
| **Frequency Bands** | **Planned/Future services and applications**  | **Timeline** |
|
| 1 350 - 1 400 MHz (or partial) | Mobile broadband | No time frame set and subject to results of sharing studies |
| 1 427 - 1 525MHz (or partial) | Mobile broadband | No time frame set and subject to results of sharing studies |
| 2 025 - 2 110 MHz | Mobile broadband | Considering for spectrum replanning when respective Management Rights expire in 2021 |
| 2 200 - 2 290 MHz | Mobile broadband | Considering for spectrum replanning when respective Management Rights expire in 2021 |
| 3 400 - 3 600 MHz | Broadband wireless access | Considering for spectrum replanning when respective Management Rights expire in 2022 |

# Bands possible to satisfy the future development of IMT systems

## Australia

Australia is currently in the process of determining its position on bands being considered under WRC-15 Agenda item 1.1.

## Bangladesh

700 MHz, 450 MHz, 2600 MHz.

## China

The following bands in potential as candidate frequency bands for study under WRC-15 agenda item 1.1 to satisfy the future development of IMT systems:

* 3 300-3 400 MHz
* 4 400-4 500 MHz
* 4 800-4 990 MHz

## Japan

The following bands are necessary to satisfy the future development of IMT systems in Japan.

* 1 427-1 452 MHz, 1 452-1 492 MHz and 1 492-1 518 MHz
(Sub-band: 1 427.9-1 510.9MHz)
* 3 400-3 600 MHz
* 3 600-4 200 MHz,
* 4 400-4 900 MHz

## Republic of Korea

The Republic of Korea is of the view that some bands could satisfy the future development of IMT systems.

## New Zealand

1 461.5 - 1 490 MHz, 2 025 - 2 110 MHz, 2 200 - 2 290 MHz and 3 400 - 3 600 MHz

# Others (additional issue to be addressed)

## Australia

|  |  |
| --- | --- |
| **Frequency Bands** | **Issue to be addressed** |
| 2 025-2 110 MHz | Development of coordination arrangements for TVOB services in RALI FX 21. |
| 2 200-2 290 MHz | Development of coordination arrangements for TVOB services in RALI FX 21. |
| 3 400-3 700 MHz | Review of frequency arrangements for the 3.4/3.5 GHz bands. |
| Sharing with co- and adjacent-band FSS earth station receivers. |
| Sharing with co- and adjacent-band radiolocation services. |
| 5 850-5 925 MHz | Determination of frequency arrangements for ITS. |
| Sharing arrangements between ITS and fixed point-to-point links. |
| Sharing arrangements between ITS and the fixed-satellite service. |
| 5 850-6 700 MHz | Formalisation of coordination arrangements between FSS Earth station transmitters and fixed service receivers |

## Republic of Korea

Refarming in the bands of the existing services should be carefully considered.

## New Zealand

For the band 1 350-1 400 MHz – It is noted that primary surveillance radar systems are operational in New Zealand within proximity to airports in the frequency range of 1 240-1 375 MHz. Such systems are expected to be continually operational until the end of year 2021 and to be replaced with similar radar systems thereafter. If any frequency in the range 1 350-1 375 MHz is to be considered as "suitable frequency ranges" for IMT, the clearance of this sub-band, or portion of this sub-band, would need to recognise the timing of a transition process. Any reallocation process should identify appropriate interference mitigation techniques, including but not limited to frequency and geographical separation to protect incumbent radar systems.

For the band 1 427-1 525 MHz – It is noted that the frequency range of 1 461.5-1 490 MHz is currently unused but New Zealand does have a significant number of existing fixed services and customer multi-access radio (CMAR) networks in adjacent frequency ranges of 1 427-1 461.5 MHz and 1 490-1 525 MHz. If any frequencies below 1 461.5 MHz and/or above 1 490 MHz are to be considered as “suitable frequency ranges”, New Zealand may consider a transition process for some sub bands. Actual use of any IMT systems in these adjacent bands would need to recognise the timing of such transition process.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The list of potential candidate frequency bands in the draft CPM text for WRC-15 agenda item 1.1 developed by ITU-R JTG 4-5-6-7 is as follows: 470-694/698 MHz, 1 350-1 400 MHz, 1 427-1 452 MHz, 1 452-1 492 MHz, 1 492-1 518 MHz, 1 518-1 525MHz, 1 695-1 710 MHz, 2 700-2 900 MHz, 3 300-3 400 MHz, 3 400-3 600 MHz, 3 600-3 700 MHz, 3 700-3 800 MHz, 3 800-4 200 MHz, 4 400-4 500 MHz, 4 500-4 800 MHz, 4 800-4 990 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz, and 5 925-6 425 MHz. [↑](#footnote-ref-1)
2. A Management Right sits within a defined range of frequencies, dates, times and other specific criteria. It confers the right to create spectrum licences within a specified range of frequencies that form a discrete block of the radio spectrum in New Zealand. [↑](#footnote-ref-2)
3. Customer Multi Access Radio (CMAR) is used to provide telephony links to clusters of subscribers in relatively isolated rural areas and difficult to reach areas in New Zealand. [↑](#footnote-ref-3)
4. A general user licence (GUL) provides for certain classes of radio transmitters to be used without the need for the user to obtain an individual licence in New Zealand. This is similar to a licence-exempt regime where frequency use is on a no-interference no-protection basis. [↑](#footnote-ref-4)
5. ETSI EN 301 055 *“Fixed Radio Systems; Point-to-multipoint equipment; Direct Sequence Code Division Multiple Access (DS-CDMA); Point-to-multipoint digital radio systems in frequency bands in the range 1 GHz to 3 GHz”* [↑](#footnote-ref-5)
6. ETSI EN 300 636 *“Fixed Radio Systems; Point-to-multipoint equipment; Time Division Multiple Access (TDMA); Point-to-multipoint digital radio systems in frequency bands in the range 1 GHz to 3 GHz”* [↑](#footnote-ref-6)
7. ETSI EN 301 021 “*Fixed Radio Systems; Point-to-multipoint equipment; Time Division Multiple Access (TDMA); Point-to-multipoint digital radio systems in frequency bands in the range 3 GHz to 11 GHz*” [↑](#footnote-ref-7)
8. ETSI EN 302 326-1 *“Fixed Radio Systems; Multipoint Equipment and Antennas; Part 1: Overview and Requirements for*

*Digital Multipoint Radio Systems”* and ETSI EN 302 326-2 “*Fixed Radio Systems; Multipoint Equipment and Antennas; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for Digital Multipoint Radio Equipment*” [↑](#footnote-ref-8)
9. ETSI EN 301 753 *“Fixed Radio Systems; Point-to-Multipoint equipment and antennas; Generic harmonized standard for Point-to-Multipoint digital fixed radio systems and antennas covering the essential requirements under Article 3.2 of the Directive 1999/5/EC”* [↑](#footnote-ref-9)