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Spectrum Management and Telecommunications

Spectrum Utilization Policy Decisions for the Band 1435-1525 MHz

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Canada 

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1. Intent

This spectrum utilization policy, announced in *Canada Gazette* Notice SMSE-009-12, addresses the spectrum allocations and utilization policies for the band 1435-1525 MHz.

2. Background

In December 2009, the Department released *Canada Gazette* Notice DGTP-010-09, *Consultation on the Spectrum Allocations and Spectrum Utilization Policies for the Frequency Range 1435-1525 MHz (L-Band)*.¹ This consultation considered both a possible designation for aeronautical mobile telemetry (AMT) applications as well as increased flexibility for the provision of broadband access. The consultation included proposals for changes concerning the allocations and footnotes in the *Canadian Table of Frequency Allocations* (CTFA),² new utilization policies and related transition policies. A moratorium was imposed on any new licensing in the band and on the issuance of new broadcasting certificates until new policies could be established following the consultation.

In response to this consultation, twelve comments were received. Comments generally supported the Department's intent to accommodate spectrum for AMT, though the need to further study the compatibility between AMT and incumbent Subscriber Radio Services (SRS) was expressed in a number of submissions.

Given the need expressed by industry to further investigate AMT and SRS compatibility, interested stakeholders—with the Department's participation—planned and carried out lab and field tests from April 2010 to June 2011. The results of these tests indicated compatibility issues between AMT and SRS under certain circumstances. Further analysis was performed by the Department to assist in making decisions on spectrum use in the range 1435-1525 MHz.

Industry Canada hereby announces its decisions for the band 1435-1525 MHz, including the details of the spectrum policy, licensing provisions, proposed licensing fees, channelling plans and technical requirements.

3. Spectrum Policy

3.1 Decisions on the Band Plan

In DGTP-010-09, the Department proposed to designate the band 1492-1525 MHz to the AMT service and to designate, for flexible use, the bands 1435-1452 MHz (fixed and mobile) and 1452-1492 MHz (fixed, mobile and broadcasting), as shown in Figure 1 below. Comments received in regard to this proposal were mixed.

¹ The full version of this consultation is available online (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09751.html>).

² The *Canadian Table of Frequency Allocations 9 kHz to 275 GHz (2009 Edition)* is available online (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09686.html>).

| | 1435 MHz | 1452 MHz | 1492 MHz | 1518 MHz | 1525 MHz |
|-----------------|---------------------------------|---|-------------------------------|----------|----------|
| Current | SRS in rural areas | Digital Audio Broadcasting | SRS in rural areas | MSS | |
| Proposed | Flexible use (fixed and mobile) | Flexible use (fixed, mobile and broadcasting) | Aeronautical Mobile Telemetry | | |

Figure 1—Current and Proposed Spectrum Utilization in DGTP-010-09

3.1.1 The Band 1435-1492 MHz—Flexible Use

Some concerns were expressed regarding the proposal for flexible use. In particular, it was noted that international footnote 5.343, which gives AMT priority over other mobile services in the band 1425-1525 MHz, may limit the potential of mobile applications (other than AMT) since they would not be protected from United States AMT deployments along the border. In addition, international footnote 5.345 currently limits the broadcasting service's usage of the band 1452-1492 MHz to Digital Audio Broadcasting (DAB) applications, thereby limiting the potential for other types of broadcasting services. Considering the ongoing development of worldwide interest, equipment and technologies for the fixed, mobile and broadcasting services, these limitations to the broadcasting and mobile services could possibly be addressed and resolved at the next World Radiocommunication Conference (WRC) in 2015.

Consequently, the Department will not designate any spectrum in the range 1435-1525 MHz for flexible use at this time and will address the possibility of a designation for flexible use within this band in a future consultation.

Decision:

Given the international interest in mobile broadband systems in this frequency range, the Department will review the spectrum utilization policy for the range 1435-1525 MHz at a later date, likely within a three to five year time frame.

3.1.2 The Band 1435-1525 MHz—SRS, AMT and Broadcasting

SRS and AMT

With SRS currently operating throughout the entire band, SRS licensees highlighted the technical and economic difficulties associated with re-tuning or replacing their deployed systems, stressing the essential nature of SRS telephone services for rural and remote communities as well as the lack of readily available alternatives.

Both the fixed service industry and the aeronautical industry were in support of experimental testing to further determine the compatibility between the AMT and fixed services using the same spectrum. As noted above, these tests were conducted, and they demonstrated that the two services are not compatible when sharing the same block of spectrum in the same area of coverage. However, the tests were inconclusive in determining the extent of the impact of harmful interference to the fixed services. The potential for interference from AMT to SRS depends on a combination of factors, including the

minimum distance between the two systems, the SRS minimum antenna discrimination and the percentage of time that the SRS system experiences severe fading.

In DGTP-010-09, the Department proposed to designate the band 1492-1525 MHz for AMT with a transition policy for SRS. The aeronautical industry was in support of accommodating AMT in the band, and indicated that there is an urgent need for 25 MHz of spectrum for use in areas of Canada located within a 320 km radius of the Mirabel and Downsview airports. Given that the tests between AMT and SRS demonstrated that the two services are not compatible when sharing the same block of spectrum in the same area, and considering that the band 1492-1525 MHz contains a significant number of SRS systems, the Department has decided not to designate spectrum for AMT in the band 1492-1525 MHz.

Given the urgent AMT spectrum requirements as well as the public benefit to accommodating the AMT service, the Department has explored potential spectrum options for AMT, in specific geographic areas and in specific portions of the band, which would minimize the impact on incumbent licensees. A search of the active licences in the entire range 1435-1525 MHz shows that the band 1452-1476 MHz contains the fewest number of fixed systems that could potentially be impacted by AMT operation. Since the introduction of the DAB designation in the late 1990s, fixed systems still operating in the band 1452-1492 MHz have not had priority and have had the option of re-tuning to the bands 1427-1452 MHz and 1492-1518 MHz.

The aeronautical industry has indicated that their AMT systems can be readily re-tuned to any portion of the band 1435-1525 MHz in order to help meet their urgent spectrum requirements.

Considering these factors, the Department is, effective immediately, designating the band 1452-1476 MHz for use by the AMT service in areas of Canada that are within a 320 km radius of both the Downsview and Mirabel airports, as shown in Figure 2. Fixed systems operating within the band 1452-1476 MHz in areas possibly affected by AMT operation (as shown in Figure 3) may continue to operate on a no-protection basis with respect to AMT services. Given the potential high-altitude nature of AMT operation, the affected areas shown in Figure 3 are much larger than the 320 km radii around the airports. In order to accommodate the AMT designation, the Department is also elevating the mobile allocation in the band 1452-1492 MHz to primary status. Within a three to five year time frame, the Department may consider reviewing the spectrum utilization policy for the entire range 1435-1525 MHz.

Given their proximity to the Canada-U.S. border, AMT operations in Canada may need to be coordinated with those in the U.S. on a case by case basis. Canada does not currently have a formal arrangement with the U.S. Government on the sharing of this band for the AMT service along the border regions. Licensees will be subject to any future agreements between Canada and the United States regarding use of these systems in the border regions, which may include obtaining departmental approval before allowing certain stations to operate.

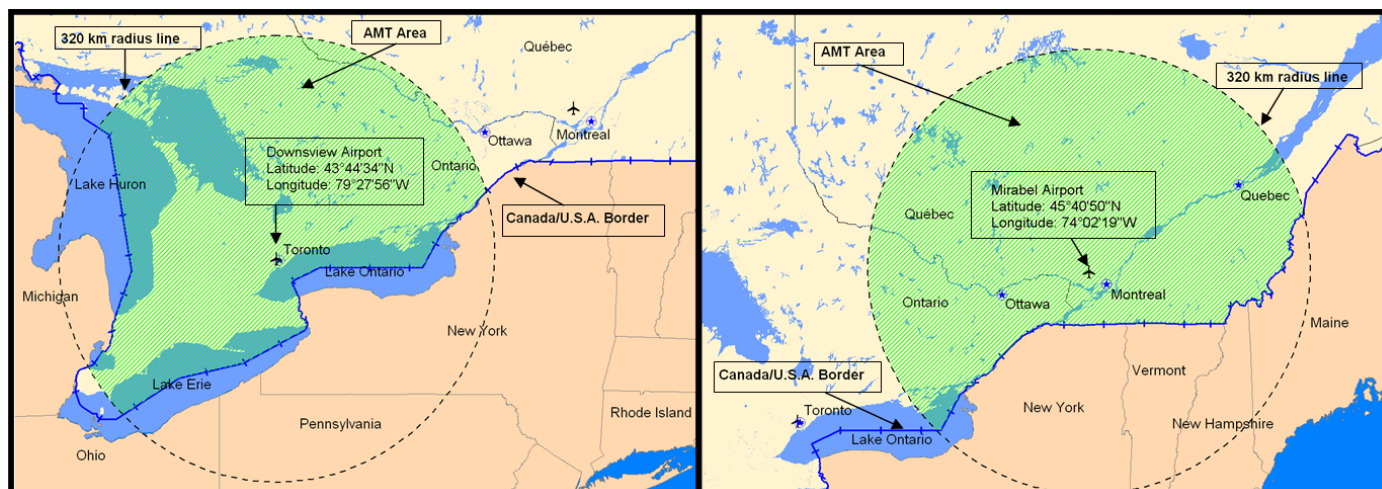


Figure 2—Areas within a 320 km radius of the Downsview (Toronto) and Mirabel (Montreal) Airports designated for use by the AMT service in the band 1452-1476 MHz

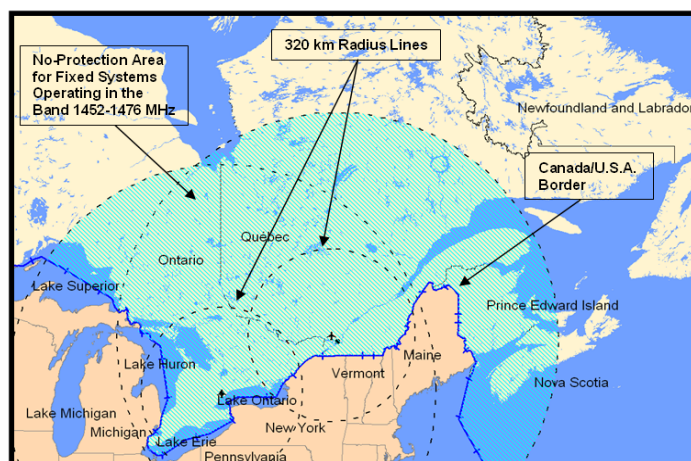


Figure 3—Areas possibly impacted by AMT operation, where fixed systems in the band 1452-1476 MHz may continue to operate only on a no-protection basis

Decision:

Effective immediately, the band 1452-1476 MHz is designated for use by the AMT service in areas of Canada that are within a 320 km radius of both the Downsview and Mirabel airports, as shown in Figure 2. After this date, fixed systems operating within the band 1452-1476 MHz in areas possibly affected by AMT operation, as shown in Figure 3, may continue to operate on a no-protection basis with respect to AMT systems.

The mobile allocation in the band 1452-1492 MHz is elevated to primary status.

Broadcasting

The *Canadian Table of Frequency Allocations* was modified in 1994 to include allocations for broadcasting and broadcasting-satellite services in the band 1452-1492 MHz, which also included existing allocations for the fixed and mobile services. Subsequently, an allotment plan was published to accommodate all existing and some new FM and AM radio stations by providing each with a DAB allotment. The dedication of the sub-band 1452-1492 MHz for DAB was justified on the expectations that DAB would replace analog FM and AM stations and that the associated spectrum would be released for new wireless services. However, this has not occurred. As such, the Department's proposals in DGTP-010-09 for the band 1452-1492 MHz were to remove the allocation to the broadcasting satellite service (BSS) and to rescind the current DAB Allotment Plan, including all channels associated with FM and AM stations.

It was noted in the consultation that a number of factors have impeded the implementation of DAB and BSS in this band. Two important factors have been the lack of affordable DAB receivers, which need to be customized for Canadian use, as well as the fact that none of these receivers are factory-installed in new vehicles. Another factor has been the success of alternative digital radio broadcasting technologies in North America (e.g., satellite radio in the band 2320-2345 MHz and terrestrial radio in the AM/FM bands). At this time, there is currently no DAB or BSS use in Canada in the band 1452-1492 MHz.

In response to DGTP-010-09, all comments received were generally in support of the Department's proposals to remove the BSS allocation and to rescind the DAB Allotment Plan. Although the broadcasting industry supported these proposals, they also indicated that a substantial portion of the band 1452-1492 MHz should remain designated for exclusive use by the broadcasting service in order to support the further development and improvement of DAB and other forms of broadcasting services, such as multimedia. In addition, they proposed that a new allotment plan be developed to support exclusive use of the band 1452-1492 MHz by the broadcasting service.

As indicated earlier, the Department will revisit the policy in the band for use by the fixed, mobile and broadcasting services in a few years. As such, this future policy review will include consideration of the broadcasting industry's proposal to designate spectrum exclusively for digital broadcasting. In the meantime, as the industry's comments indicated that there is a lack of interest in DAB and BSS use in Canada, the Department will rescind the DAB Allotment Plan for the band 1452-1492 MHz and will remove the allocation to BSS in the band 1452-1492 MHz. The broadcasting service allocation in the band 1452-1492 MHz will remain, and future use of this band by the broadcasting service will be given full consideration when the policy for the band is revisited.

Decision:

The DAB Allotment Plan for the band 1452-1492 MHz, including all associated channels to FM and AM stations across the band, is rescinded, effective immediately.

The allocation to BSS in the band 1452-1492 MHz is removed from the *Canadian Table of Frequency Allocations*.

3.1.3 The Band 1492-1525 MHz—N-MCS and MSS

N-MCS

In DGTP-010-09, the Department proposed to rescind the designation for narrowband multipoint communication systems (N-MCS) in the band 1493.5-1496.5 MHz. All comments received were in support of this proposal. In addition to the lack of interest in deploying N-MCS in this portion of the band, there are currently no N-MCS systems licensed or operating in this range. As a result, the Department is rescinding the designation for N-MCS from 1493.5-1496.5 MHz. This decision does not impact existing use.

MSS

The Department proposed to remove the mobile-satellite service (MSS) allocation in the band 1518-1525 MHz. It was noted in the consultation that the MSS allocation in the band 1518-1525 MHz is paired with the band 1670-1675 MHz, which is designated for terrestrial services in Canada and in the United States. Additionally, there is a lack of interest in North America for MSS, both in the band 1668-1675 MHz as well as in the paired band 1518-1525 MHz.

All comments received were in agreement with the Department's proposal. As such, the Department will remove the MSS allocation in the paired bands 1518-1525 MHz and 1668-1675 MHz.

Decision:

The designation for N-MCS in the band 1493.5-1496.5 MHz is rescinded, effective immediately.

The allocation to MSS in the paired bands 1518-1525 MHz and 1668-1675 MHz is removed from the *Canadian Table of Frequency Allocations*.

3.2 Summary of Changes to the Canadian Table of Frequency Allocations

As a result of the band plan decisions, several changes will be made to the *Canadian Table of Frequency Allocations* and have been depicted using the following legend:

Strikeout indicates removing or rescinding an allocation entry, a Canadian footnote or an international footnote from the defined portion of the Canadian Table.

Modify (MOD) indicates modifying a Canadian footnote in the Table.

Underline indicates the addition of an allocation or footnote.

Furthermore, changes to an allocation may result in either the modification or the suppression of a footnote, depending on its relevancy in other frequency ranges.

3.2.1 The band 1435-1452 MHz

There are no changes required to the *Canadian Table of Frequency Allocations* in this band as a result of the decisions herein.

3.2.2 The band 1452-1492 MHz

As a result of the band plan decisions, the following changes are made to the Canadian Table and Canadian Footnotes for the band 1452-1492 MHz:

| MHz |
|--|
| 1 452 - 1 492 |
| BROADCASTING BROADCASTING-SATELLITE 5.208B FIXED MOBILE Mobile5.343 |
| 5.341 5.345 C28 C29 C30 C40 |

Footnotes removed from the 1452-1492 MHz portion of the Canadian Table:

5.208B In the bands:

137-138 MHz,
 387-390 MHz,
 400.15-401 MHz,
 1 452-1 492 MHz,
 1 525-1 610 MHz,
 1 613.8-1 626.5 MHz,
 2 655-2 690 MHz,
 21.4-22 GHz,

Resolution **739 (Rev. WRC-07)** applies. (**WRC-07**)

C28 In the band 1 452-1 492 MHz, until at least 1 January 2000, the broadcasting-satellite service shall not cause harmful interference to the fixed service. After this date, the fixed service may continue to operate provided that it neither causes harmful interference to, nor is affected by the broadcasting-satellite service beam assignments when the broadcasting-satellite service is implemented in Canada. This footnote will be reviewed prior to 1 January 2000.

C29 In the band 1 452-1 492 MHz, existing fixed stations may continue to operate provided these installations do not cause interference nor claim protection from, stations of the broadcasting service operating in accordance with the domestic allotment plan implemented under **C30**.

C30 In the band 1 452-1 492 MHz, stations in the broadcasting service shall be implemented in accordance with a domestic allotment plan, which takes into account stations in the fixed service, to the extent possible.

Footnote removed from the 1452-1492 MHz portion of the Canadian Table, and further modified:

~~MOD C40 Feeder links to broadcasting satellite (sound) space stations operating in the band 1 452-1 492 MHz shall be implemented in the band 7 025-7 075 MHz to the extent possible before a different fixed-satellite (Earth-to-space) band is so used. Use of the fixed-satellite (Earth-to-space) allocation in the 7 025-7 075 MHz band is limited to this application, except for general fixed-satellite use by inter-Regional fixed-satellite networks.~~

3.2.3 The band 1492-1525 MHz

As a result of the band plan decisions, the following changes are made to the Canadian Table and Canadian Footnotes for the band 1492-1525 MHz:

| MHz | |
|------------------------------|---|
| 1 492 - 1 518 | FIXED MOBILE 5.341 |
| <u>1 492 - 1 518 - 1 525</u> | FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.348 5.348B 5.351A C31 5.341 |

Footnotes removed from the 1492-1525 MHz portion of the Canadian Table:

5.348 The use of the band 1 518-1 525 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. In the band 1 518-1 525 MHz stations in the mobile-satellite service shall not claim protection from the stations in the fixed service. No. **5.43A** does not apply. **(WRC-03)**

5.348B In the band 1 518-1 525 MHz, stations in the mobile-satellite service shall not claim protection from aeronautical mobile telemetry stations in the mobile service in the territory of the United States (see Nos. **5.343** and **5.344**) and in the countries listed in No. **5.342**. No. **5.43A** does not apply. **(WRC-03)**

5.351A For the use of the bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 668-1 675 MHz, 1 980-2 010 MHz, 2 170-2 200 MHz, 2 483.5-2 520 MHz and 2 670-2 690 MHz by the mobile-satellite service, see Resolutions **212 (Rev. WRC-07)** and **225 (Rev. WRC-07)**. **(WRC-07)**

C31 (CAN-04) In the bands 1 518-1 525 MHz and 1 668-1 675 MHz, the mobile-satellite service is withheld.

3.2.4 The band 1668-1675 MHz

As a result of the band plan decisions for the band 1518-1525 MHz (as discussed in section 3.1.3), the following changes are made to the Canadian Table and Canadian Footnotes for the band 1668-1675 MHz:

| MHz | |
|-----------------|---|
| 1 668 - 1 668.4 | MOBILE SATELLITE (Earth to space) 5.351A 5.379B 5.379C C31 RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed 5.149 5.341 5.379A |
| 1 668.4 - 1 670 | FIXED METEOROLOGICAL AIDS MOBILE SATELLITE (Earth to space) 5.351A 5.379B 5.379C C31 RADIO ASTRONOMY 5.149 5.341 5.379D 5.379E |
| 1 670 - 1 675 | FIXED METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE (except aeronautical mobile) MOBILE SATELLITE (Earth to space) 5.351A 5.379B C31 5.341 5.379D 5.379E 5.380A |

Footnotes removed from the 1668-1675 MHz portion of the Canadian Table:

5.351A For the use of the bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 668-1 675 MHz, 1 980-2 010 MHz, 2 170-2 200 MHz, 2 483.5-2 520 MHz and 2 670-2 690 MHz by the mobile-satellite service, see Resolutions **212 (Rev. WRC-07)** and **225 (Rev. WRC-07)**. **(WRC-07)**

5.379B The use of the band 1 668-1 675 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. In the band 1 668-1 668.4 MHz, Resolution **904 (WRC-07)** shall apply. **(WRC-07)**

5.379C In order to protect the radio astronomy service in the band 1 668-1 670 MHz, the aggregate power flux-density values produced by mobile earth stations in a network of the mobile-satellite service operating in this band shall not exceed $-181 \text{ dB(W/m}^2\text{)}$ in 10 MHz and $-194 \text{ dB(W/m}^2\text{)}$ in any 20 kHz at any radio astronomy station recorded in the Master International Frequency Register, for more than 2% of integration periods of 2 000 s. **(WRC-03)**

C31 See text above.

5.380A In the band 1 670-1 675 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, existing earth stations in the meteorological-satellite service notified before 1 January 2004. Any new assignment to these earth stations in this band shall also be protected from harmful interference from stations in the mobile-satellite service. **(WRC-07)**

3.3 Summary of Band Plan Decisions

Figure 4, shown below, summarizes the decisions made with respect to the 1435-1525 MHz band plan. It is not a complete summary of the designated or allocated services in the band 1435-1525 MHz. For a complete record of decisions regarding modifications to the *Canadian Table of Frequency Allocations*, please refer to the previous subsections (3.2.1; 3.2.2; 3.2.3).

Additionally, “Current” refers to the pre-existing environment prior to the release of this decision paper, while “Decision” refers to any changes that are implemented with the release of this paper.

| | 1435 MHz | 1452 MHz | 1476 MHz | 1492 MHz | 1518 MHz | 1525 MHz |
|-----------------|--------------------|------------------------------|-----------------------|--|----------|----------|
| Current | SRS in rural areas | DAB BSS | | SRS in rural areas N-MCS ^a | MSS | |
| Decision | SRS in rural areas | DAB BSS AMT | DAB BSS | SRS in rural areas N-MCS | MSS | |

Figure 4—Current and Decision Spectrum Utilization Policy for the Band 1435-1525 MHz

^a The designation for N-MCS, shown in Figure 4, is within the sub-band 1493.5-1496.5 MHz and is rescinded, effective immediately.

The Department will undertake the development of technical requirements for AMT use of this band in consultation with the Radio Advisory Board of Canada (RABC), which will be in line with the band plan provided in Figure 4.

In DGTP-010-09, due to the review of the band’s spectrum utilization policies, a moratorium on new licensing in the band 1435-1525 MHz was imposed by the Department to reduce potential transition issues. Given that the Department has herein announced its decisions on the new policies for the band, this moratorium is no longer in effect.

The Department will review the spectrum utilization policy for the range 1435-1525 MHz, likely within a three to five year time frame.

4. AMT Licensing Approach and Fees

Industry Canada will accept **complete radio station licence applications** for potential AMT services in designated service areas (see section 3.1.2).

Applicants may submit their applications to the nearest Industry Canada Spectrum Management office.³

4.1 Eligibility

Licensees must comply, on an ongoing basis, with eligibility criteria as set out in subsection 9(1) of the *Radiocommunication Regulations*.⁴

4.2 Licensing Approach and Term

Authorization of AMT stations will be granted, via issuance of radio station licences, on an exclusive first-come, first-served (FCFS) basis. Radio licences expire on March 31 of each year, and annual licence renewal fees must be paid before March 31 of each year for the subsequent year (April 1 to March 31).

4.3 Service Areas

As indicated in section 3.1.2 of this document, AMT operations within the 1452-1476 MHz frequency band will commence effective immediately. These operations are limited to only two designated service areas of 320 km radius each, geographically centered upon airports located in Downsview, Ontario and Mirabel, Quebec. Refer to Figure 2 for a graphical representation of these service areas.

Note that effective immediately, fixed radio stations currently authorized to operate within the band 1452-1476 MHz may continue to do so, on a no-protection basis with respect to AMT operations.

4.4 Licence Fees

AMT fixed stations operating in the band 1452-1476 MHz will be licensed as fixed stations operating in the land mobile service, and fees will be charged as prescribed in section 63 of the *Radiocommunication Regulations*.

Associated AMT aircraft and other mobiles operating in the band 1452-1476 MHz will be licensed as mobile stations, and fees will be charged as prescribed in subsection 60(6) of the *Radiocommunication Regulations*.

³ A complete list of regional and district offices is provided in [Radiocommunication Information Circular 66 \(RIC-66\)](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01742.html), available at the following Industry Canada website: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01742.html>.

⁴ A complete version of the [Radiocommunication Regulations](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01265.html) is available online (<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01265.html>).

5. Domestic Coordination

Domestic coordination requirements between licensees of the AMT service within the same and adjacent service areas will be outlined in the technical requirements, to be developed in consultation with the Radio Advisory Board of Canada.

6. International Coordination

Canada does not currently have a formal arrangement with the U.S. Government for the sharing of the band 1435-1525 MHz for the AMT service along the border regions. Licensees will be subject to any future agreements between Canada and the United States regarding use of these systems in the border regions, which may include obtaining departmental approval before allowing certain stations to operate.

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