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Spectrum Management and Telecommunications

Standard Radio System Plan

Technical Requirements for Land Mobile Radio Services Operating in the Bands 768-776 MHz and 798-806 MHz

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Preface

Standard Radio System Plan SRSP-511, issue 3, *Technical Requirements for Land Mobile Radio Services Operating in the Bands 768-776 MHz and 798-806 MHz*, replaces the revised version of SRSP-511, issue 2, *Technical Requirements for Land Mobile Radio Services Operating in the Bands 768-776 MHz and 798-806 MHz*, dated December 2017.

The following are the main changes:

1. The addition of section 5.5 specifying conditions for aeronautical use of select frequencies within this band.
2. The replacement of details concerning cross-border coordination requirements with references to the applicable Arrangement.
3. The designation of four trunking groups from the pool of channels identified as national system channels to be available for air-to-ground applications.
4. Other editorial updates and improvements have been made throughout the document.

Issued under the authority of
the Minister of Innovation, Science and Industry

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Director General
Engineering, Planning and Standards Branch

Contents

1 Intent

1. This Standard Radio System Plan (SRSP) states the minimum technical requirements for the purpose of efficient spectrum utilization for land mobile, aeronautical mobile, and fixed point-to-point systems operating in the public safety bands 768-776 MHz and 798-806 MHz.

2 General

2. Radio systems conforming to the requirements contained in this SRSP will take priority in licensing and coordination over non-standard systems proposed for operation in these bands. However, the use of more spectrally efficient technologies is strongly encouraged and different channelization from what is described herein may be considered if it results in increased spectrum efficiency. Such systems would be authorized on a standard basis.

3. This SRSP is intended to aid in the design of radio systems and specifies system characteristics relating only to efficient spectrum usage; it is not to be regarded as a comprehensive specification for equipment design and/or selection.

4. Notwithstanding the fact that a system satisfies the requirements of this SRSP, Innovation, Science and Economic Development Canada (ISED) may require adjustment to radio and auxiliary equipment in radio stations whenever harmful interference is caused to any radio station or system. “Harmful interference,” as defined in the *Radiocommunication Act*, means an adverse effect of electromagnetic energy from any emission, radiation or induction that (a) endangers the use or functioning of a safety-related radiocommunication system; or (b) significantly degrades or obstructs, or repeatedly interrupts, the use or functioning of radio apparatus or radio-sensitive equipment.

5. The arrangements for non-standard systems are outlined in Spectrum Utilization Policy SP Gen, *General Information Related to Spectrum Utilization and Radio Systems Policies*.

6. ISED should be advised when potential conflicts between radio systems cannot be resolved by the parties concerned. After consultation with these parties, ISED will determine what modifications need to be made and establish a schedule for these modifications in order to resolve the conflict.

7. Equipment used for land mobile systems operating in the bands 768-776 MHz and 798-806 MHz shall be certified in accordance with the current version of Radio Standard Specification RSS-119, *Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz*.

8. ISED reserves the right to limit protection to licensed radio receivers only to the extent of the bandwidth of the transmitters whose emissions they are licensed to

receive. Licensees and/or applicants should use receiver selectivity characteristics or filters that improve the receiver's ability to reject harmful interference.

9. In the paired frequency blocks, simplex frequency operation utilizing the base/repeater and mobile transmit frequency (known as repeater talk-around) beyond the service area of a paired frequency system may be permitted on a case-by-case basis as an adjunct to the paired frequency system. Such operation may be permitted within the authorized service area at the discretion of the system operator and will be on a no-interference, no-protection (NINP) basis. The public safety interoperability channels are exempt from this restriction.

10. Auxiliary base stations (often referred to as control stations) can transmit on either base or mobile transmit frequencies.

11. Very low capacity fixed systems may be authorized in these bands on a secondary no interference, no-protection basis in accordance with the appropriate Radio Systems Policies (RPs) and should be in accordance with applicable technical provisions of this SRSP.

Editor's note: ISED is soliciting comments and input on the utility of VLC fixed systems in this band.

12. New and amendment licence applications will require the submission of administrative, operational and technical information to ISED. Licence applications can be made on the Radiocommunication Licensing Services webpage under the section, *Apply for a Licence*. For additional guidance, see Radio Standards Procedure *RSP-101, Licence Application Submission Procedure for Planned Radio Stations Below 960 MHz*. Upon request from ISED, applicants and licensees shall provide additional information of their radio systems, such as technical parameters.

3 Related documents

13. The current issues of the following documents are applicable and are available on the Spectrum management and telecommunications website.

TRAA — *Treaty Series 1962 No. 15 — Coordination and Use of Radio Frequencies — Exchange of Notes Between Canada and the United States of America*

Arrangement Q, *Sharing arrangement between the Department of Industry of Canada and the Federal Communications Commission of the United States of America concerning the use of the frequency bands 768-776 MHz and 798-806 MHz by the Land Mobile Service along the Canada-United States border*

CTFA — *Canadian Table of Frequency Allocations*

RP-Gen	*General Spectrum Policy Principles and Other Information Related to Spectrum Utilization and Radio Systems Policies*
RP-003	*Policy Guidelines for Mobile Radio Trunked Systems*
RP-004	*Policy for the Licensing of Very Low Capacity Point to Point Links in the Band 30-890 MHz*
RP-006	*Policy for the Use of 700 MHz Systems for Public Safety Applications and Other Limited Use of Broadcasting Spectrum*
RP-25	*Policy Principles for Public Safety Radio Interoperability*
SP Gen	*General Information Related to Spectrum Utilization and Radio Systems Policies*
SP 746	*Mobile Service Allocation Decision and Designation of Spectrum for Public Safety in the Frequency Band 746-806 MHz*
SP 768	*Narrowband and Wideband Public Safety Radiocommunication Systems in the Bands 768-776 MHz and 798-806 MHz*
SP 30-896 MHz, Part I	*Spectrum Allocation and Utilization in Certain Bands in the Range 30.01-896 MHz*
SP 30-896 MHz, Part II	*Spectrum Utilization Policy for the Mobile, Broadcasting and Amateur Services in the Frequency Range 30-896 MHz*
RSS-Gen	*General Requirements for Compliance of Radio Apparatus*
RSS-102	*Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)*
RSS-119	*Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz*
RSP-100	*Certification of Radio Apparatus and Broadcasting Equipment*
RSP-101	*Licence Application Submission Procedure for Planned Radio Stations Below 960 MHz*
CPC-2-0-03	*Radiocommunication and Broadcasting Antenna Systems*
GL-04	*Channel Loading Guidelines*

SMSE-002-12 *Policy and Technical Framework: Mobile Broadband Services (MBS) – 700 MHz Band, Broadband Radio Service (BRS) – 2500 MHz Band*

SAB-001-13 *Public Safety Operations in the Band 775-776 MHz*

CPC - Client Procedures Circular
GL - Guidelines
RP - Radio Systems Policy
RSP - Radio Standards Procedure
RSS - Radio Standards Specification
SAB - Spectrum Advisory Bulletin
SMSE - Spectrum Management Spectrum Engineering
SP - Spectrum Utilization Policy
TRAA - Terrestrial Radiocommunication Agreements and Arrangements

4 International coordination

14. Usage of the bands 768-776 MHz and 798-806 MHz within the Canada-United States (U.S.) border area is subject to the provisions of Arrangement Q, *Sharing Arrangement between the Department of Industry of Canada and the Federal Communications Commission of the United States of America concerning the use of the frequency bands 768-776 MHz and 798-806 MHz by the Land Mobile Service along the Canada-United States border, hereafter* referred to as “the Arrangement”.

15. All channel usage in the Canada-United States border area will be assigned based on the technical and operational requirements and at the discretion of the Regional Office, depending on local requirements. Usage in the border area is subject to international agreements with the United States. Conditions may be added during the term of the licence if required to align with the provisions of international agreements between the Government of the United States and the Government of Canada.

16. Sharing Zone definitions, channel allocations and other limits and constraints to operations within the border Sharing Zones are described in annex B, annex C, and annex D.

Editor’s note: A new cross-border Arrangement, superseding Arrangement Q, is likely to be published prior to the publication of SRSP-511 Issue 3. Once the new Arrangement is in force, this section will be revised and the relevant Annexes removed or modified in favour of a reference to the new Arrangement.

5 General guidelines

17. This section provides descriptions of general principles for operation in this band, including channel designations, modes of operation, hierarchy of public safety use, and aeronautical mobile use of the band.

5.1 Channel designations and frequency assignments for the bands 768-776 MHz and 798-806 MHz

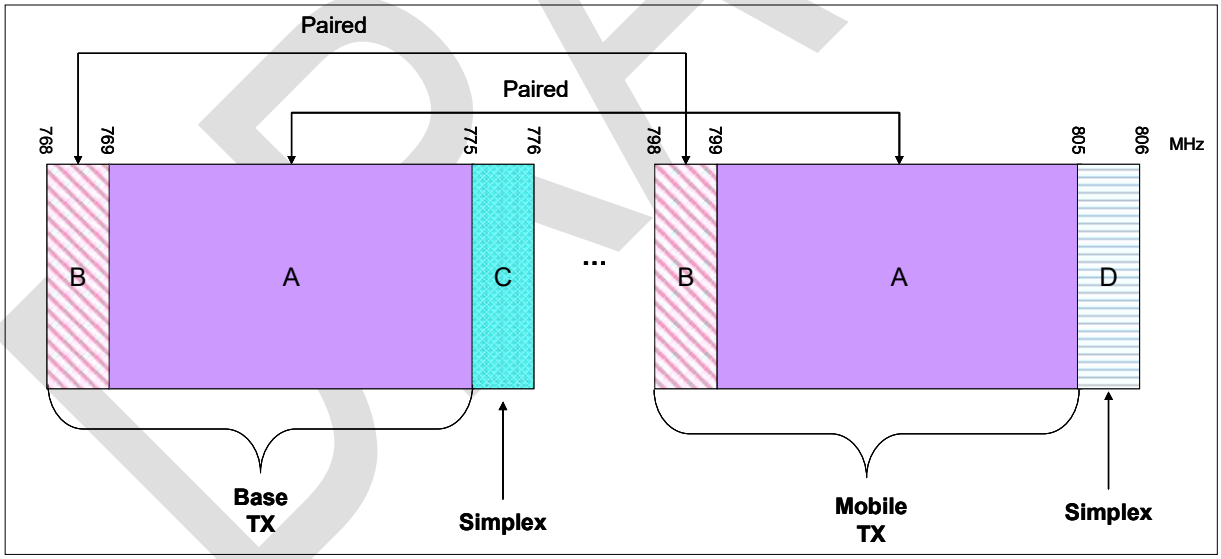
18. Frequency assignments and corresponding channel designations shall be in accordance with the formulas in tables 1, 2, 3 and 4 in this section.

19. The bands 768-775 MHz and 798-805 MHz are to be used on the basis of a two-frequency (duplex) channel plan. For land mobile service operations, the base station transmitters will normally operate in the 768-775 MHz band and the mobile station transmitters will normally operate in the 798-805 MHz band. A mobile station may also transmit on its associated base station frequency when operating in a simplex mode. Base station-to-base station transmissions, including fixed repeater and fixed control operations, may occur in either frequency band 768-775 MHz or 798-805 MHz (see blocks A and B in figure 1).

20. The bands 775-776 MHz and 805-806 MHz are to be used on the basis of a single frequency (simplex) channel plan (see blocks C and D in figure 1).

21. Blocks A and D will be assigned first. Blocks B and C will be assigned, on an exceptional basis, at the discretion of the regional office.

Figure 1 - Frequency blocks



22. The bands 768-776 MHz and 798-806 MHz will be channelized into 6.25 kHz wide channels. Up to eight of these narrowband channels can be combined to create 12.5 kHz, 25 kHz or 50 kHz wide channels, but they must meet a minimum spectrum efficiency standard data rate of 4.8 kbps per 6.25 kHz bandwidth or at least one voice channel per 12.5 kHz of bandwidth. The frequencies corresponding to the channel number are defined by the formulas in tables 1, 2, 3 and 4 below, where n is

the channel number and series A, B, C and D are designated for the channels of bandwidth 6.25 kHz, 12.5 kHz, 25 kHz and 50 kHz respectively.

Table 1 – Paired channel series for 769-775 MHz and 799-805 MHz (Block A in figure 1)

	Lower edge (MHz)	Centre frequency (MHz)	Upper edge (MHz)
Base	$AA_n = 769.0 + (0.00625)\times(n-1)$ where n = 1 to 960 $AB_n = 769.0 + (0.0125)\times(n-1)$ where n = 1 to 480 $AC_n = 769.0 + (0.025)\times(n-1)$ where n = 1 to 240 $AD_n = 769.0 + (0.05)\times(n-1)$ where n = 1 to 120	$AA_n = 769.003125 + (0.00625)\times(n-1)$ where n = 1 to 960 $AB_n = 769.00625 + (0.0125)\times(n-1)$ where n = 1 to 480 $AC_n = 769.0125 + (0.025)\times(n-1)$ where n = 1 to 240 $AD_n = 769.025 + (0.05)\times(n-1)$ where n = 1 to 120	$AA_n = 769.0 + (0.00625)\times(n)$ where n = 1 to 960 $AB_n = 769.0 + (0.0125)\times(n)$ where n = 1 to 480 $AC_n = 769.0 + (0.025)\times(n)$ where n = 1 to 240 $AD_n = 769.0 + (0.05)\times(n)$ where n = 1 to 120
Mobile	$AA_n = 799.0 + (0.00625) \times (n-961)$ where n = 961 to 1920 $AB_n = 799.0 + (0.0125)\times(n-481)$ where n = 481 to 960 $AC_n = 799.0 + (0.025)\times(n-241)$ where n = 241 to 480 $AD_n = 799.0 + (0.05)\times(n-121)$ where n = 121 to 240	$AA_n = 799.003125 + (0.00625) \times (n-961)$ where n = 961 to 1920 $AB_n = 799.00625 + (0.0125)\times(n-481)$ where n = 481 to 960 $AC_n = 799.0125 + (0.025)\times(n-241)$ where n = 241 to 480 $AD_n = 799.025 + (0.05)\times(n-121)$ where n = 121 to 240	$AA_n = 799.0 + (0.00625) \times (n-960)$ where n = 961 to 1920 $AB_n = 799.0 + (0.0125)\times(n-480)$ where n = 481 to 960 $AC_n = 799.0 + (0.025)\times(n-240)$ where n = 241 to 480 $AD_n = 799.0 + (0.05)\times(n-120)$ where n = 121 to 240

Table 2 – Paired channel series for 768-769 MHz and 798-799 MHz (Block B in figure 1)

	Lower edge (MHz)	Centre frequency (MHz)	Upper edge (MHz)
Base	$BA_n = 768.0 + (0.00625)\times(n-1)$ where n = 1 to 160 $BB_n = 768.0 + (0.0125)\times(n-1)$ where n = 1 to 80 $BC_n = 768.0 + (0.025)\times(n-1)$ where n = 1 to 40 $BD_n = 768.0 + (0.05)\times(n-1)$ where n = 1 to 20	$BA_n = 768.003125 + (0.00625)\times(n-1)$ where n = 1 to 160 $BB_n = 768.00625 + (0.0125)\times(n-1)$ where n = 1 to 80 $BC_n = 768.0125 + (0.025)\times(n-1)$ where n = 1 to 40 $BD_n = 768.025 + (0.05)\times(n-1)$ where n = 1 to 20	$BA_n = 768.0 + (0.00625)\times(n)$ where n = 1 to 160 $BB_n = 768.0 + (0.0125)\times(n)$ where n = 1 to 80 $BC_n = 768.0 + (0.025)\times(n)$ where n = 1 to 40 $BD_n = 768.0 + (0.05)\times(n)$ where n = 1 to 20
Mobile	$BA_n = 798.0 + (0.00625)\times(n-161)$ where n = 161 to 320 $BB_n = 798.0 + (0.0125)\times(n-81)$ where n = 81 to 160 $BC_n = 798.0 + (0.025)\times(n-41)$ where n = 41 to 80 $BD_n = 798.0 + (0.05)\times(n-21)$ where n = 21 to 40	$BA_n = 798.003125 + (0.00625)\times(n-161)$ where n = 161 to 320 $BB_n = 798.00625 + (0.0125)\times(n-81)$ where n = 81 to 160 $BC_n = 798.0125 + (0.025)\times(n-41)$ where n = 41 to 80 $BD_n = 798.025 + (0.05)\times(n-21)$ where n = 21 to 40	$BA_n = 798.0 + (0.00625)\times(n-160)$ where n = 161 to 320 $BB_n = 798.0 + (0.0125)\times(n-80)$ where n = 81 to 160 $BC_n = 798.0 + (0.025)\times(n-40)$ where n = 41 to 80 $BD_n = 798.0 + (0.05)\times(n-20)$ where n = 21 to 40

Table 3 – Simplex channel series for 775-776 MHz (Block C in figure 1)

	Lower Edge (MHz)	Centre frequency (MHz)	Upper edge (MHz)
Base and mobile	$CA_n = 775.0 + (0.00625)\times(n-1)$ where n = 1 to 160 $CB_n = 775.0 + (0.0125)\times(n-1)$ where n = 1 to 80 $CC_n = 775.0 + (0.025)\times(n-1)$ where n = 1 to 40 $CD_n = 775.0 + (0.05)\times(n-1)$ where n = 1 to 20	$CA_n = 775.003125 + (0.00625)\times(n-1)$ where n = 1 to 160 $CB_n = 775.00625 + (0.0125)\times(n-1)$ where n = 1 to 80 $CC_n = 775.0125 + (0.025)\times(n-1)$ where n = 1 to 40 $CD_n = 775.025 + (0.05)\times(n-1)$ where n = 1 to 20	$CA_n = 775.0 + (0.00625)\times(n)$ where n = 1 to 160 $CB_n = 775.0 + (0.0125)\times(n)$ where n = 1 to 80 $CC_n = 775.0 + (0.025)\times(n)$ where n = 1 to 40 $CD_n = 775.0 + (0.05)\times(n)$ where n = 1 to 20

Table 4 – Simplex channel series for 805-806 MHz (Block D in figure 1)

	Lower edge (MHz)	Centre frequency (MHz)	Upper edge (MHz)
Base and mobile	$DA_n = 805.0 + (0.00625) \times (n-1)$ where n = 1 to 160 $DB_n = 805.0 + (0.0125)\times(n-1)$ where n = 1 to 80 $DC_n = 805.0 + (0.025)\times(n-1)$ where n = 1 to 40 $DD_n = 805.0 + (0.05)\times(n-1)$ where n = 1 to 20	$DA_n = 805.003125 + (0.00625)\times(n-1)$ where n = 1 to 160 $DB_n = 805.00625 + (0.0125)\times(n-1)$ where n = 1 to 80 $DC_n = 805.0125 + (0.025)\times(n-1)$ where n = 1 to 40 $DD_n = 805.025 + (0.05)\times(n-1)$ where n = 1 to 20	$CA_n = 805.0 + (0.00625)\times(n)$ where n = 1 to 160 $CB_n = 805.0 + (0.0125)\times(n)$ where n = 1 to 80 $CC_n = 805.0 + (0.025)\times(n)$ where n = 1 to 40 $CD_n = 805.0 + (0.05)\times(n)$ where n = 1 to 20

23. The channel spacing between associated mobile and base station centre frequencies is 30 MHz.

24. To improve spectrum efficiency, frequency reuse is required in systems or networks where many frequencies may be licensed to one licensee. Preference will be given to more spectrally efficient systems.

25. Frequencies designated for duplex operation may be assigned for simplex operation where conditions warrant.

26. Assignment of channels for different bandwidths will begin at the channels shown in table 5. For example, in the frequency band 768-769 MHz, the assignment of 12.5 kHz licences will begin at channel 1 and subsequent assignments will be made upwards (channels 2, 3, etc.); the assignment of 50 kHz licences will begin at channel 20 and subsequent assignments will be made downwards (channels 19, 18, etc.). Figure 2 provides an illustration of this process.

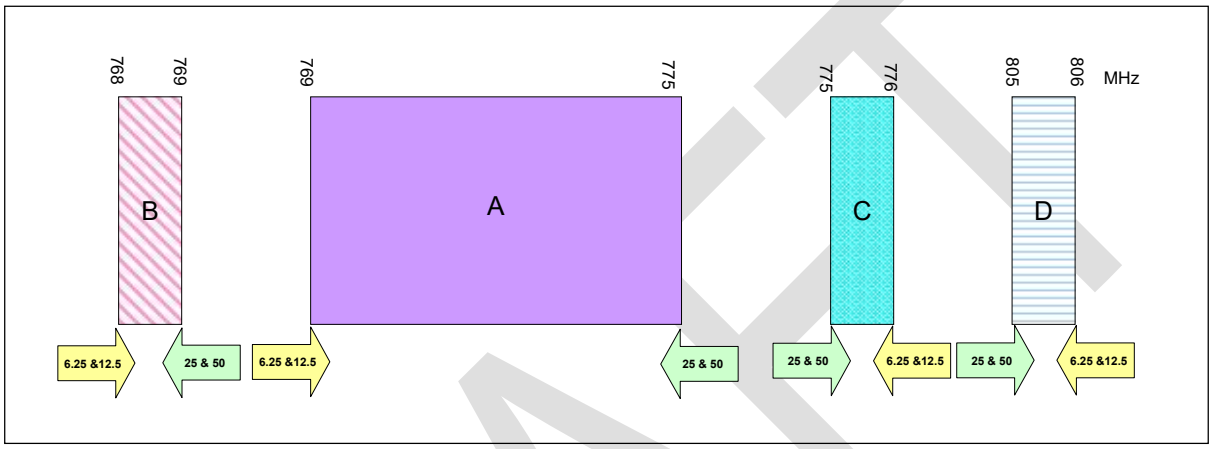
Table 5 - Assignment of channels based on channel bandwidth

	Channel number and direction			
Base band (MHz)	768-769 MHz	769-775 MHz	775-776 MHz	805-806 MHz
6.25 kHz	1 up	13 up	160 down	160 down

12.5 kHz	1 up	7 up	80 down	80 down
25 kHz	40 down	237 down	1 up	1 up
50 kHz	20 down	117 down	1 up	1 up

27. Channel numbers correspond to the A, B, C and D-series channel numbers in tables 1, 2, 3 and 4.

Figure 2 - Assignment of channels based on channel bandwidth



28. Channels of 25 kHz or 50 kHz will not be assigned where they would overlap with the interoperability channels shown in table 8 or the low power channels shown in section 6.2.

29. Normally, 25 kHz or 50 kHz channels will not be assigned where they would overlap the trunking groups shown in table A1 of annex A.

Editor's note: ISED is soliciting comments and input on retaining the option of 50 kHz channels.

5.2 Conventional mobile radio systems

30. Conventional radio systems are defined as radio systems in which one or more radio frequency channels are assigned to mobile and base stations but are not used as a trunk group.

31. Assignments for conventional systems can be made from the available spectrum in a given area up to a maximum of three channels at any one site.

5.3 Trunked radio systems

32. Trunked radio systems are those that allow automatic selection and assignment of a voice channel from a number of channels equipped at a base station site. Any

system using more than three channels at one site, excluding the interoperability channels listed in table 8, shall be configured as a trunked system.

33. As outlined in table A1 of annex A, ISED has listed, as a guideline, trunking groups for system deployments in this band. Within the Canada-United States border area, as defined in the Arrangement, the number of trunking groups varies depending on the number of channels available. Trunking groups are identified by the first channel number. The centre frequencies for each channel within the group are separated by 250 kHz which is equivalent to 40 channels of 6.25 kHz. Expansion of trunked systems to more channels per group is to be assigned from other trunked system groups.

34. Interoperability channels used for trunking systems are on a secondary, no-interference, no-protection basis to conventional interoperability operations. If interoperability channels are used in a trunking system, they must immediately be released when they are needed for conventional interoperability purposes.

35. The interoperability calling, aeronautical, and mobile data channels (see table 8) should not normally be included in a trunking system.

5.4 Public Safety - Hierarchy of safety service users

36. The bands 768-776 MHz and 798-806 MHz are designated for use by public safety services. Public safety services (Categories 1 and 2) involving the preservation of life and protection of property will continue to have access to exclusive channels and any potential sharing of channels by public safety services will be with other public safety services.

37. For the identification of public safety service providers, ISED recognizes the hierarchy and definition of categories of safety service providers as stated in the Radio Systems Policy RP-25, *Policy Principles for Public Safety Radio Interoperability*. This hierarchy of agencies is applied in the radio licensing process to determine priority access to spectrum designated or made available for public safety use.

38. Category 1 system operators are eligible for trunked or conventional systems. Category 2 and 3 system operators are eligible to share trunked systems with Category 1 users provided that the latter remain the major users of the system. Major users are agencies which have priority over other types of users on the system. For instance, Category 2 system users would not be eligible to operate their own systems within the bands 768-776 MHz and 798-806 MHz unless the local spectrum management office is satisfied that their operation would not preclude the future introduction of a Category 1 system.

39. ISED encourages public safety agencies to establish network-sharing partnerships to increase spectrum efficiencies and facilitate interoperability. Therefore, Category 3 system operators and selected supervisory personnel of non-government agencies

may be permitted access to public safety systems through these partnership agreements; during emergency situations; however, their access will be at the discretion of major users operating those systems.

5.5 Aeronautical mobile use in the bands 768-776 MHz and 798-806 MHz

40. Channels in the 768-776 MHz and 798-806 MHz Public Safety Bands may be licensed for conventional system use in aircraft for operational communication and coordination between aircraft and ground-based mobile units and base stations. Aircraft licensed to operate in this band will be licensed on a no-interference no-protection basis, with the following restrictions.

41. The conditions of this section apply to mobile radios installed in an aircraft.

42. For aircraft transmitters operating in this band the transmitter power is limited to a maximum effective radiated power (ERP) of 2 watts.

43. Low-altitude aircraft (operating at or below 914 m above ground level) may operate while airborne on their assigned channel provided the aircraft transmits within the licensed altitude and location, as well as all other conditions identified in their licence.

44. Table 6 lists the channels in this band available for assignment to low altitude aircraft operations.

Table 6 - Channels available for low altitude aircraft operation

Channel # 6.25 kHz (AA#)	Centre Frequency (MHz)	Channel # 12.5 kHz (AB#)	Centre Frequency (MHz)
AA315	770.965625	AB158	770.96875
AA316	770.971875		
AA355	771.215625	AB178	771.21875
AA356	771.221875		
AA371	771.315625	AB186	771.31875
AA372	771.321875		
AA395	771.465625	AB198	771.46875
AA396	771.471875		
AA411	771.565625	AB206	771.56875
AA412	771.571875		

Channel # 6.25 kHz (AA#)	Centre Frequency (MHz)	Channel # 12.5 kHz (AB#)	Centre Frequency (MHz)
AA435	771.715625	AB218	771.71875
AA436	771.721875		
AA451	771.815625	AB226	771.81875
AA452	771.821875		
AA475	771.965625	AB238	771.96875
AA476	771.971875		
AA491	772.065625	AB246	772.06875
AA492	772.071875		
AA515	772.215625	AB258	772.21875
AA516	772.221875		
AA531	772.315625	AB266	772.31875
AA532	772.321875		
AA555	772.465625	AB278	772.46875
AA556	772.471875		
AA571	772.565625	AB286	772.56875
AA572	772.571875		
AA595	772.715625	AB298	772.71875
AA596	772.721875		
AA611	772.815625	AB306	772.81875
AA612	772.821875		
AA635	772.965625	AB318	772.96875
AA636	772.971875		
AA651	773.065625	AB326	773.06875

Channel # 6.25 kHz (AA#)	Centre Frequency (MHz)	Channel # 12.5 kHz (AB#)	Centre Frequency (MHz)
AA652	773.071875		

45. Low-altitude aircraft are not permitted to transmit when operating at altitudes above 914 m or when operating within the applicable proximity limits to the Canada-U.S. border as specified in table D1 of annex D.

46. High-altitude aircraft (operating at or below 3,048 m above ground) may only be licensed to operate on channels in the band 768 to 768.15 MHz and 798 to 798.15 MHz identified in table 7. Aircraft are not permitted to operate in this band at altitudes greater than 3,048 meters above ground.

Table 7 - Designated high-altitude channels

Channel #	Base Centre Frequency (MHz) at 12.5 kHz bandwidth	Mobile Centre Frequency (MHz) at 12.5 kHz bandwidth
BB1	768.00625	798.00625
BB2	768.01875	798.01875
BB3	768.03125	798.03125
BB4	768.04375	798.04375
BB5	768.05625	798.05625
BB6	768.06875	798.06875
BB7	768.08125	798.08125
BB8	768.09375	798.09375
BB9	768.10625	798.10625
BB10	768.11875	798.11875
BB11	768.13125	798.13125
BB12	768.14375	798.14375

47. Licensees intending to deploy aircraft operations in the bands 768-776 MHz and 798-806 MHz must ensure that their signal does not exceed a power flux density (pfd) of -124 dBW/m^2/25 kHz at the extent of Zone IV and Zone V in the U.S. as described in annex B. In the event of harmful interference, regardless of signal strength, the licensee should take immediate action to eliminate such interference. ISED may require licensees to demonstrate that they have taken action regardless if they comply with the limits of the Arrangement.

6 Spectrum availability and sub-allocation plan

48. This section specifies the channel usage and sub-allocations in the 768-776 MHz and 798-806 MHz bands.

6.1 Interoperability channels in the bands 769-775 MHz and 799-805 MHz

49. The following channels are available as public safety interoperability (I/O) channels. These channels are available for use in all areas and are to be used only for coordination of tactical communications between different public safety agencies or for other similar emergency communications. Usage of these channels is shared between Canadian and U.S. public safety agencies and may be locally coordinated in accordance with the interoperability requirements of Canadian and U.S. licensees.

50. In table 8, the channel numbers correspond to the AA-series 6.25 kHz channels in table 1. Channels which are used to establish contact between public safety entities in order for the parties to move to an interoperability channel are designated as “I/O Calling”. These channels are not for use as traffic channels. Channels generally intended for the transmission of data are designated as “I/O Mobile data”. Channels to be used for communication between aircraft and mobile units are designated as “I/O Aeronautical”, operating within the limits specified in section 5.5.

Table 8 - Interoperability channels

Base/mobile (AA-series channels)	To	Base/mobile (AA-series channels)	Designation
23 / 983	to	24 / 984	I/O (Interoperability)
39 / 999	to	40 / 1000	I/O Calling
63 / 1023	to	64 / 1024	I/O
79 / 1039	to	80 / 1040	I/O
103 / 1063	to	104 / 1064	I/O
119 / 1079	to	120 / 1080	I/O
143 / 1103	to	144 / 1104	I/O
159 / 1119	to	160 / 1120	I/O
183 / 1143	to	184 / 1144	I/O
199 / 1159	to	200 / 1160	I/O
223 / 1183	to	224 / 1184	I/O Aeronautical
239 / 1199	to	240 / 1200	I/O
263 / 1223	to	264 / 1224	I/O
279 / 1239	to	280 / 1240	I/O Mobile data
303 / 1263	to	304 / 1264	I/O
319 / 1279	to	320 / 1280	I/O
641 / 1601	to	642 / 1602	I/O
657 / 1617	to	658 / 1618	I/O
681 / 1641	to	682 / 1642	I/O Calling
697 / 1657	to	698 / 1658	I/O
721 / 1681	to	722 / 1682	I/O
737 / 1697	to	738 / 1698	I/O
761 / 1721	to	762 / 1722	I/O
777 / 1737	to	778 / 1738	I/O
801 / 1761	to	802 / 1762	I/O
817 / 1777	to	818 / 1778	I/O
841 / 1801	to	842 / 1802	I/O
857 / 1817	to	858 / 1818	I/O
881 / 1841	to	882 / 1842	I/O
897 / 1857	to	898 / 1858	I/O
899 / 1859	to	900 / 1860	I/O Aeronautical
921 / 1881	to	922 / 1882	I/O Mobile data
937 / 1897	to	938 / 1898	I/O

51. RSS-119 specifies that transmitters operating on the interoperability channels in the bands 769-775 MHz and 799-805 MHz shall conform to the following technical standards:

52. Transmitters designed for voice operation on the interoperability channels shall include a 12.5 kHz bandwidth mode of operation that conforms to the following standards, which are incorporated by reference:

    - *Project 25 – FDMA Common Air Interface – New Technology Standards Project – Digital Radio Technical Standards*, Telecommunications Industry Association, TIA-102.BAAA; and

    - *Project 25 – Vocoder Description*, Telecommunications Industry Association, TIA-102.BABA.

53. Transmitters designed for data transmission on narrowband interoperability channels shall include a 12.5 kHz bandwidth mode of operation that conforms to the following standards, which are incorporated by reference*:*

    - *Project 25 – Data Overview – New Technology Standards Project – Digital Radio Technical Standards*, Telecommunications Industry Association, TIA-102.BAEA;

    - *Project 25 – Packet Data Specification – New Technology Standards Project – Digital Radio Technical Standards*, Telecommunications Industry Association, TIA-102.BAEB;

    - *Project 25 – Radio Management Protocols – New Technology Standards Project – Digital Radio Technical Standards*, Telecommunications Industry Association, TIA-102.BAEE; and

    - *Project 25 – FDMA Common Air Interface – New Technology Standards Project – Digital Radio Technical Standards*, Telecommunications Industry Association, TIA-102.BAAA.

54. Mobile and portable transmitters operating on narrowband channels in the bands 769-775 MHz and 799-805 MHz must be capable of operating on all of the designated nationwide narrowband interoperability channels pursuant to the technical standards as specified above. However, mobile and portable transmitters that are designed to operate only on the low power channels specified in section 6.2 are exempt from this interoperability channel requirement.

55. Mobile and portable transmitters that are designed to operate only in the data mode, with the exception of the 25 kHz and 50 kHz bandwidth systems, must be capable of operation on the data interoperability channels specified in table 8, but need not be capable of voice operation on other interoperability channels.

56. Mobile and portable transmitters that are designed to operate only in the voice mode do not have to operate on the data interoperability channels specified in table 8.

6.2 Low-power channels in the bands 769-775 MHz and 799-805 MHz

57. Channels 1 to 12, 949 to 972 and 1909 to 1920, corresponding to the AA-series 6.25 kHz channels, are available for narrowband low power use.

58. These channels will be available for mobile operations only. No fixed station will be allowed on these channels. These channels are available on an unprotected basis. Operation on these low power channels is limited to a maximum ERP of 2 watts.

6.3 National radio systems in the bands 769-775 MHz and 799-805 MHz

59. As shown in table 9 below, 34 paired narrowband channels are sub-allocated for national land mobile radio systems.

60. A national land mobile frequency assignment will be considered if the operational function satisfies the following requirements: (1) operational necessity for the mobile and/or portable radio equipment to travel and be used on a regular basis, normally within all regions of the country, and operational necessity for the mobile and/or portable radio equipment to operate on the same frequency (or frequencies) at all operating locations; or (2) to provide response to unpredictable emergencies of national geographic scope and concern. National systems can be conventional or trunked type.

61. As a guide, the national channels are set out in trunking groups as shown in table 9. Variations and combinations of these trunking groups can be assigned at the discretion of the regional office.

Table 9 National channels/trunking groups

Group (first channel in group)	National trunking channels (AA-series channels)								
309	309	349	389	429	469	509	549	589	629
310	310	350	390	430	470	510	550	590	630
363	363	403	443	483	523	563	603	643	
364	364	404	444	484	524	564	604	644	

62. Assignment of the national channels will begin with trunking groups 309, 310, 363 and 364.

63. In areas where there is spectrum congestion, national channels may be assigned for local use at the discretion of the regional office.

6.4 Conventional channels in the bands 769-775 MHz and 799-805 MHz

64. As outlined below, 148 paired 6.25 kHz channels are sub-allocated as conventional channels.

Table 10 Conventional channels (AA-series channels)

Base/mobile	To	Base/mobile	Base/mobile	To	Base/mobile
31/991	to	38/998	517/1477	to	520/1480
71/1031	to	78/1038	557/1517	to	560/1520
111/1071	to	118/1078	597/1557	to	600/1560
151/1111	to	158/1118	637/1597	to	640/1600
195/1151	to	198/1158	671/1631	to	680/1640
235/1191	to	238/1198	711/1671	to	720/1680
275/1231	to	278/1238	751/1711	to	760/1720
317/1277	to	318/1278	791/1751	to	800/1760
357/1317	to	360/1320	831/1791	to	840/1800
397/1357	to	400/1360	871/1831	to	880/1840
437/1397	to	440/1400	911/1871	to	920/1880
477/1437	to	480/1440			

65. In areas where there is spectrum congestion, conventional channels may be combined to create trunking groups at the discretion of the regional office.

6.5 Trunking channels in the bands 769-775 MHz and 799-805 MHz

66. The remaining 656 paired 6.25 kHz channels that are not sub-allocated in previous sections will be sub-allocated as trunked channels (see table A1 in annex A).

67. Variations and combinations of the trunking groups in table A1 of annex A can be assigned at the discretion of the regional office.

7 Technical criteria

68. This section describes the technical criteria for assignment and operation in this band, including the requirements for channel sharing, the guidelines for channel loading, and the limits for co-channel assignments.

7.1 Channel sharing

69. Section 40 of the *Radiocommunication Regulations* states: “The assignment of a frequency or frequencies to a holder of a radio authorization does not confer a monopoly on the use of the frequency or frequencies, nor shall a radio authorization be construed as conferring any right of continuing tenure in respect of the frequency or frequencies.”

7.2 Loading guidelines

70. Channel loading guidelines are specified in GL-04, *Channel Loading Guidelines*.

71. In the frequency assignment process, these guidelines may be used in conjunction with current observed channel occupancy data (obtained with automatic occupancy measuring equipment) to determine whether additional channels are required. Such observations will also be used to assess the general loading criteria and the inherent trade-off between sound spectrum management and acceptable Grades of Service.

72. ISED is using this approach to make frequency assignments, but may also take into account other considerations when assessing the number of radio channels to be assigned to a system. Applicants should provide as much traffic-related data as possible with their application.

7.3 Limits and co-channel assignments

73. The ERP shall be limited to that necessary to provide the required service as determined by the system requirements. In addition, the ERP will be subject to the limitations within the sharing and protection zones, as defined in the Arrangement. Outside the sharing and protection zones, systems requiring an ERP greater than 125 watts may require additional justification and will be considered on a case-by-case basis by the local spectrum management office.

74. In urban areas and areas of intensive mobile use, the minimum geographic separation between co-channel base stations of different networks will be calculated based on a non-overlap of the 40 dBµV/m protected contour of the existing station and the 22 dBµV/m interference contour of the proposed station. This criterion is not applicable to systems operating on the same channel at different times (vertical loading) within the same service area.

75. The protected contour of the existing station is calculated based on a probability of service of 50% of the time for 50% of the locations at the edges of the contour.

76. The interference contour is calculated using the probability that the interfering signal level used is not exceeded more than 10% of the time for 50% of the locations at the edges of the contour (i.e. 90% of the time it is below the threshold for 50% of the locations).

Annex A: Trunking channel sub-allocations in the bands 768-776 MHz and 798-806 MHz

Trunked sub-allocations

Table A1: Trunked sub-allocations (AA-series channels)

Group (first channel of group)	Trunking channels							
13	13	53	93	133	173	213		
14	14	54	94	134	174	214		
15	15	55	95	135	175	215		
16	16	56	96	136	176	216		
17	17	57	97	137	177	217		
18	18	58	98	138	178	218		
19	19	59	99	139	179	219		
20	20	60	100	140	180	220		
21	21	61	101	141	181	221		
22	22	62	102	142	182	222		
25	25	65	105	145	185	225		
26	26	66	106	146	186	226		
27	27	67	107	147	187	227		
28	28	68	108	148	188	228		
29	29	69	109	149	189	229	269	
30	30	70	110	150	190	230	270	
41	41	81	121	161	201			
42	42	82	122	162	202			
43	43	83	123	163	203	243	283	323
44	44	84	124	164	204	244	284	324
45	45	85	125	165	205			
46	46	86	126	166	206			
47	47	87	127	167	207			
48	48	88	128	168	208			
49	49	89	129	169	209			
50	50	90	130	170	210			
51	51	91	131	171	211	251	291	331
52	52	92	132	172	212	252	292	332
191	191	231	271	311	351	391		
192	192	232	272	312	352	392		
193	193	233	273	313	353	393		
194	194	234	274	314	354	394		
241	241	281	321	361	401			
242	242	282	322	362	402			
245	245	285	325	365	405			
246	246	286	326	366	406			
247	247	287	327	367	407	447		

Group (first channel of group)	Trunking channels							
248	248	288	328	368	408	448		
249	249	289	329	369	409	449		
250	250	290	330	370	410	450		
253	253	293	333	373	413	453		
254	254	294	334	374	414	454		
255	255	295	335	375	415	455		
256	256	296	336	376	416	456		
257	257	297	337	377	417			
258	258	298	338	378	418			
259	259	299	339	379	419	459		
260	260	300	340	380	420	460		
261	261	301	341	381	421	461		
262	262	302	342	382	422	462		
265	265	305	345	385	425	465		
266	266	306	346	386	426	466		
267	267	307	347	387	427	467		
268	268	308	348	388	428	468		
343	343	383	423	463	503			
344	344	384	424	464	504			
431	431	471	511	551	591	631		
432	432	472	512	552	592	632		
433	433	473	513	553	593	633		
434	434	474	514	554	594	634		
441	441	481	521	561	601			
442	442	482	522	562	602			
445	445	485	525	565	605			
446	446	486	526	566	606			
457	457	497	537	577	617			
458	458	498	538	578	618			
487	487	527	567	607	647	687		
488	488	528	568	608	648	688		
489	489	529	569	609	649	689		
490	490	530	570	610	650	690		
493	493	533	573	613	653	693		
494	494	534	574	614	654	694		
495	495	535	575	615	655	695		
496	496	536	576	616	656	696		
499	499	539	579	619	659	699		
500	500	540	580	620	660	700		
501	501	541	581	621	661	701		
502	502	542	582	622	662	702		
505	505	545	585	625	665	705		
506	506	546	586	626	666	706		
507	507	547	587	627	667	707		
508	508	548	588	628	668	708		
543	543	583	623	663	703			
544	544	584	624	664	704			
645	645	685	725	765	805	845	885	925

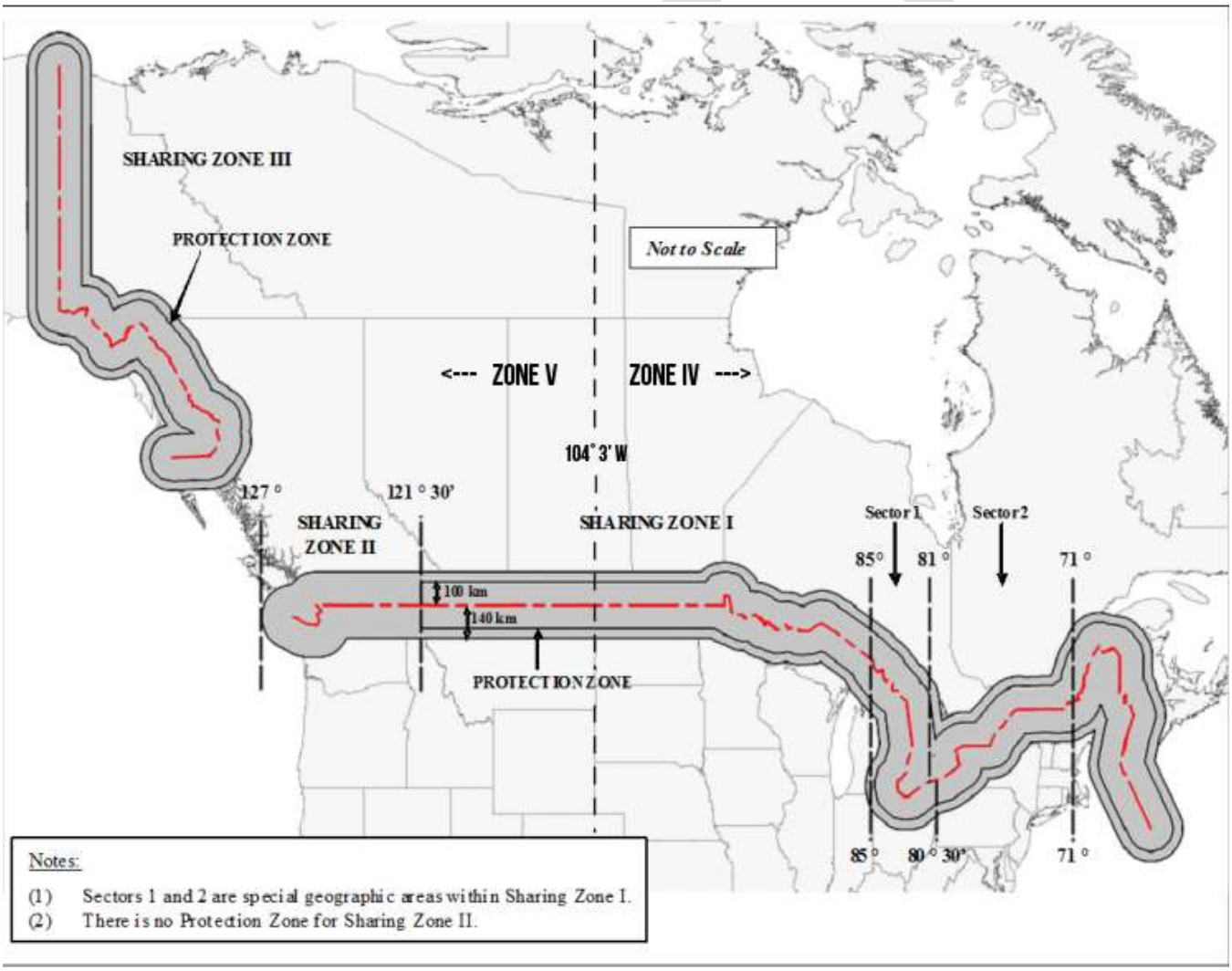
Group (first channel of group)	Trunking channels							
646	646	686	726	766	806	846	886	926
669	669	709	749	789	829	869	909	
670	670	710	750	790	830	870	910	
683	683	723	763	803	843	883	923	
684	684	724	764	804	844	884	924	
691	691	731	771	811	851	891	931	
692	692	732	772	812	852	892	932	
727	727	767	807	847	887	927		
728	728	768	808	848	888	928		
729	729	769	809	849	889	929		
730	730	770	810	850	890	930		
733	733	773	813	853	893	933		
734	734	774	814	854	894	934		
735	735	775	815	855	895	935		
736	736	776	816	856	896	936		
739	739	779	819	859	899	939		
740	740	780	820	860	900	940		
741	741	781	821	861	901	941		
742	742	782	822	862	902	942		
743	743	783	823	863	903	943		
744	744	784	824	864	904	944		
745	745	785	825	865	905	945		
746	746	786	826	866	906	946		
747	747	787	827	867	907	947		
748	748	788	828	868	908	948		

Annex B: Channel usage along the Canada-United States border

Editor's note: A new cross-border Arrangement, superseding Arrangement Q, is likely to be published prior to the publication of SRSP-511 Issue 3. Once the new Arrangement is in force, this section will be removed or modified in favour of a reference to the new Arrangement.

B1. Sharing along the Canada-United States border

B1.1 The coordination zone along the Canada-United States border is made up of the 5 sharing zones and 2 sectors described in tables B1a and B1b and shown in the figure below.



B1.2 Distribution/allotment of frequencies

B1.2.1 Tables B1a and B1b below show the channels allocated for Canadian unrestricted use in the coordination zone.

Table B1a - Channels allocated for Canadian unrestricted use along the Canada-United States border in the bands 769-775 MHz and 799-805 MHz

Area	Channels	Restrictions
SHARING ZONE I (Outside Sectors 1 and 2) East of 121° 30' W, within 100 km of the Canada-United States border area	181-182, 185-198, 221-222, 225-238, 261-262, 265-278, 301-302, 305-318, 327-634, 643-656, 659-660, 683-696, 699-700, 723-736, 739-740, 763-776, 779-780	Table B4
-Within Sector 1 (81°W to 85°W) (Portion of Zone I)	305-318, 429-532, 643-656	Table B4
-Within Sector 2 (71°W to 81°W) (Portion of Zone I)	101-102, 105-118, 141-142, 145-158, 181-182, 185-198, 211-222, 225-238, 241-262, 265-278, 281-302, 305-318, 321-640, 643-656, 659-680, 683-696, 699-720, 723-736, 739-750, 763-776, 779-780, 803-816, 819-820, 843-856, 859-860	Table B4
SHARING ZONE II Between 121° 30' and 127° W. and extending within 140 km of the Canada-United States border area	181-182, 185-198, 221-222, 225-238, 261-262, 265-278, 301-302, 305-318, 327-634, 643-656, 659-660, 683-696, 699-700, 723-736, 739-740, 763-776, 779-780	Table B5
SHARING ZONE III Adjacent to the Alaska-British Columbia/Yukon Territory border and extending a distance of 100 km within the Canada-United States border area	181-182, 185-198, 221-222, 225-238, 261-262, 265-278, 301-302, 305-318, 327-634, 643-656, 659-660, 683-696, 699-700, 723-736, 739-740, 763-776, 779-780	Table B4

Note: All channel numbers refer to AA-series 6.25 kHz channels. Paired mobile station channels are 30 MHz (960 channels) higher.

Table B1b: Blocks allocated for Canadian unrestricted use along the Canada-United States border in the bands 768-769 MHz, 775-776 MHz, 798-799 MHz and 805-806 MHz

Area	Blocks	Restrictions
SHARING ZONE I (Outside Sectors 1 and 2) East of 121° 30' W, within 100 km of the Canada-United States border area	768 to 768.50 MHz 798 to 798.50 MHz 775 to 775.50 MHz 805 to 805.50 MHz	Table B4
-Within Sector 1 (81°W to 85°W) (Portion of Zone I)	768 to 768.15 MHz 798 to 798.15 MHz 775 to 775.15 MHz 805 to 805.15 MHz	Table B4
-Within Sector 2 (71°W to 81°W) (Portion of Zone I)	768 to 768.70 MHz 798 to 798.70 MHz 775 to 775.70 MHz 805 to 805.70 MHz	Table B4
SHARING ZONE II Between 121° 30' and 127° W. and extending within 140 km of the Canada-United States border area	768 to 768.50 MHz 798 to 798.50 MHz 775 to 775.50 MHz 805 to 805.50 MHz	Table B5
SHARING ZONE III Adjacent to the Alaska-British Columbia/Yukon Territory border and extending a distance of 100 km within the Canada-United States border area	768 to 768.50 MHz 798 to 798.50 MHz 775 to 775.50 MHz 805 to 805.50 MHz	Table B4

B1.2.2 The following special provisions will apply:

(a) Peterborough, Ontario 44° 18' 00.2" N, 78° 18' 59.2" W and Kitchener-Waterloo, Ontario 43° 27' 30.2" N, 80° 29' 59.4" W are considered to fall outside of Sharing Zone I (given by centre coordinates and encompassing a circle of a 30-km radius).

(b) Within the area of a 30-km radius from the city centre coordinates of London, Ontario 42° 59'N, 81° 14'W, Canada shall have unrestricted geographic use of Sector 2 frequencies on an uncoordinated basis.

B1.3 Coordination necessitated by the special sharing arrangements

B1.3.1 As a result of the division of spectrum described above, portions of the bands allotted to both countries overlap. Therefore, proposed frequency assignments in the overlapping portions in those bands, as described in paragraphs B1.3.2 and B1.3.3 below, will be coordinated.

B1.3.2 Coordination is required for assignments on the frequencies listed below in the following geographical areas (see annex C, figure C1):

(a) the geographical area in Canada enclosed by the Canada-United States border, the meridian 71º W; and the line beginning at the intersection of 72º W and the Canada-United States border, thence running north along meridian 72º W to the intersection of 45º 45' N, thence running east along 45º 45' N to the meridian 71º W; and

the geographical area in the United States enclosed by the Canada-United States border, the meridian 71º W; and the line beginning at the intersection of 44º 25' N, 71º W, thence running by great circle arc to the intersection of 45º N, 70º W, thence north along meridian 70º W to the intersection of 45º 45' N, thence running west along 45º 45' N to the intersection of the Canada-United States border.

Table B2a: Channels requiring coordination in specific areas in the bands 769-775 MHz and 799-805 MHz (annex C, figure C1)

(Base/Mobile)	To	(Base/Mobile)
101 / 1061	to	102 / 1062
105 / 1065	to	118 /1078
141 / 1101	to	142 / 1102
145 / 1105	to	158 / 1118
211 / 1171	to	220 / 1180
241 / 1201	to	260 / 1220
281 / 1241	to	300 / 1260
321 / 1281	to	326 / 1286
635 / 1595	to	640 / 1600
661 / 1621	to	680 / 1640
701 / 1661	to	720 / 1680
741 / 1701	to	750 / 1710
803 / 1763	to	816 / 1776
819 / 1779	to	820 / 1790
843 / 1803	to	856 / 1816
859 / 1819	to	860 / 1820

Note: All channel numbers refer to AA-series 6.25 kHz channels.

Table B2b: Blocks requiring coordination in specific areas in the bands 768-769 MHz, 775-776 MHz, 798-799 MHz and 805-806 MHz (Annex C, Figure C1)

Base	Mobile
768.50 to 768.70 MHz	798.50 to 798.70 MHz

775.50 to 775.70 MHz	805.50 to 805.70 MHz

B1.3.3 Coordination is required for assignments on the frequencies listed below in the following areas (see annex C, figure C2):

(a) the geographical area in Canada enclosed by the meridian of 81º W longitude, the arc of a circle of 100-km radius centred at 41º 58' N latitude and 80º 30' W longitude at the southern shore of Lake Erie and drawn clockwise from the northerly intersection with 81º W longitude to intersect the Canada-United States border east of 80º 30' W, and the Canada-United States border; and

(b) the geographical area in the United States enclosed by the meridian of 81º W longitude, the arc of a circle of 100-km radius centred at 42º 39' 30" N latitude and 81º W longitude at the northern shore of Lake Erie and drawn clockwise from the southerly intersection with 80º 30' W longitude to intersect the Canada-United States border west of 81º W, and the Canada-United States border.

Table B3a: Channels requiring coordination in specific areas in the bands 769-775 MHz and 799-805 MHz (annex C, figure C2)

(Base/Mobile)	To	(Base/Mobile)
101 / 1061	to	102 / 1062
105 / 1065	to	118 /1078
141 / 1101	to	142 / 1102
145 / 1105	to	158 / 1118
181 / 1141	to	182 / 1142
185 / 1145	to	198 / 1158
211 / 1171	to	222 / 1182
225 / 1185	to	238 / 1198
241 / 1201	to	262 / 1222
265 / 1225	to	278 / 1238
281 / 1241	to	302 / 1262
321 / 1281	to	428 / 1388
533 / 1493	to	640 / 1600
659 / 1619	to	680 / 1640
683 / 1643	to	696 / 1656
699 / 1659	to	720 / 1680
723 / 1683	to	736 / 1696
739 / 1699	to	750 / 1710
763 / 1723	to	776 / 1736
779 / 1739	to	780 / 1740
803 / 1763	to	816 / 1776
819 / 1779	to	820 / 1790
843 / 1803	to	856 / 1816

859 / 1819	to	860 / 1820

Note: All channel numbers refer to AA-series 6.25 kHz channels.

Table B3b: Blocks requiring coordination in specific areas in the bands 768-769 MHz, 775-776 MHz, 798-799 MHz and 805-806 MHz (annex C, figure C2)

Base	Mobile
768.15 to 768.70 MHz	798.15 to 798.70 MHz
775.15 to 775.70 MHz	805.15 to 805.70 MHz

B2. Special provisions concerning the use of the bands 768-776 MHz and 798-806 MHz

B2.1 Use of frequencies allotted to the United States

B2.1.1 Frequencies allotted for primary, unrestricted use by the United States may be assigned for use within the coordination zone under the conditions established in section 7 of Arrangement Q – *Sharing arrangement between the Department of Industry Canada and the Federal Communications Commission of the United States of America concerning the use of the frequency bands 768-776 MHz and 798-806 MHz by the Land Mobile Service along the Canada-United States border*, published in October 2013.

B2.2 In making assignments for use of any frequency in the bands 768-776 MHz and 798-806 MHz by the land mobile service, U.S. TV stations must be protected according to the following Desired to Undesired (D/U) signal ratios:

(a) The minimum D/U ratio is 40 dB for co-channel analogue TV stations and 0 dB for adjacent channel analogue TV stations. The minimum D/U ratio must be satisfied within the analogue TV stations' 64 dBµV/m contour and is based on interference at 50% of locations, no more than 10% of the time.

(b) The minimum D/U ratio is 17 dB for co-channel DTV stations and -23 dB for adjacent channel DTV stations. The minimum D/U ratio must be satisfied within the DTV stations' 41 dBµV/m contour and is based on interference at 50% of locations, no more than 10% of the time.

B3. Limits of effective radiated power (e.r.p.) and antenna height along the Canada-United States border

E.r.p. is defined as the product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction.

B3.1 For base stations in Sharing Zones I and III, Sectors 1 and 2 and the Protection Zones, Table B4 lists the limits of e.r.p. corresponding to the effective antenna height (EAH) ranges shown. In this case, EAH is calculated by subtracting the assumed average terrain elevation given in table B6 from the antenna height above mean sea level.

Table B4: Limits of e.r.p. corresponding to EAH of base stations in Sharing Zones I and III, Sectors 1 and 2 and the Protection Zones

EAH		e.r.p. watts (Maximum)
Metres	**Feet**	
0-152	0-500	500
153-305	501-1000	125
306-457	1001-1500	40
458-609	1501-2000	20
610-914	2001-3000	10
915-1066	3001-3500	6
Above 1067	Above 3501	5

B3.2 For base stations in Sharing Zone II, table B5 lists the limits of e.r.p. corresponding to the antenna height above mean sea level ranges shown.

Table B5: Limits of e.r.p. corresponding to antenna heights above mean sea level of base stations in Sharing Zone II

Antenna Height Above Mean Sea Level		e.r.p. watts (Maximum)
Metres	**Feet**	
0-503	0-1650	500
504-609	1651-2000	350
610-762	2001-2500	200
763-914	2501-3000	140
915-1066	3001-3500	100
1067-1219	3501-4000	75
1220-1371	4001-4500	70
1372-1523	4501-5000	65
Above 1523	Above 5000	5

B3.3 Table B6 lists the values of assumed average terrain elevations (AATE) within the Sharing and Protection Zones on both sides of the Canada-United States border.

Effective Antenna Height = Antenna Height Above Mean Sea Level – Assumed Average Terrain Elevations

Table B6: Values of Assumed Average Terrain Elevation Within the Sharing and Protection Zones on Both Sides of the Canada-United States Border

Longitude (Φ) (°West)	Latitude (Ω) (°North)	Assumed Average Terrain Elevation			
		United States		Canada	
		Feet	Metres	Feet	Metres
65 ≤Φ< 69	Ω< 45	0	0	0	0
"	45 ≤Ω< 46	300	91	300	91
"	Ω≥ 46	1000	305	1000	305
69 ≤Φ< 73	All	2000	609	1000	305
73 ≤Φ< 74	"	500	152	500	152
74 ≤Φ< 78	"	250	76	250	76
78 ≤Φ< 80	Ω< 43	250	76	250	76
"	Ω≥ 43	500	152	500	152
80 ≤Φ< 90	All	600	183	600	183
90 ≤Φ< 98	"	1000	305	1000	305
98 ≤Φ< 102	"	1500	457	1500	457
102 ≤Φ< 108	"	2500	762	2500	762
108 ≤Φ< 111	"	3500	1066	3500	1066
111 ≤Φ< 113	"	4000	1219	3500	1066
113 ≤Φ< 114	"	5000	1524	4000	1219
114 ≤Φ< 121.5	"	3000	914	3000	914
121.5 ≤Φ127	"	0	0	0	0
Φ≥ 127	54 ≤Ω< 56	0	0	0	0
"	56 ≤Ω< 58	500	152	1500	457
"	58 ≤Ω< 60	0	0	2000	609
"	60 ≤Ω< 62	4000	1219	2500	762
"	62 ≤Ω< 64	1600	488	1600	488
"	64 ≤Ω< 66	1000	305	2000	609
"	66 ≤Ω< 68	750	228	750	228
"	68 ≤Ω< 69.5	1500	457	500	152
"	Ω≥ 69.5	0	0	0	0

Table B7: Cities in Canada and the United States that are considered as falling outside of Sharing Zone I

These cities are defined as circles with a 30-km radius around the centre coordinates listed below.

Location	Coordinates [NAD83]	
	Latitude	Longitude
Akron, Ohio	41° 05' 00.2" N	81° 30' 39.4" W
Youngstown, Ohio	41° 05' 57.2" N	80° 39' 01.3" W
Syracuse, New York	43° 03' 04.2" N	76° 09' 12.7" W
Kitchener-Waterloo, Ontario	43° 27' 30.2" N	80° 29' 59.4" W
Peterborough, Ontario	44° 18' 00.2" N	78° 18' 59.2" W

Annex C: Band overlap coordination areas

Editor's note: A new cross-border Arrangement, superseding Arrangement Q, is likely to be published prior to the publication of SRSP-511 Issue 3. Once the new Arrangement is in force, this section will be removed or modified in favour of a reference to the new Arrangement.

Areas in which coordination is required

Figure C1

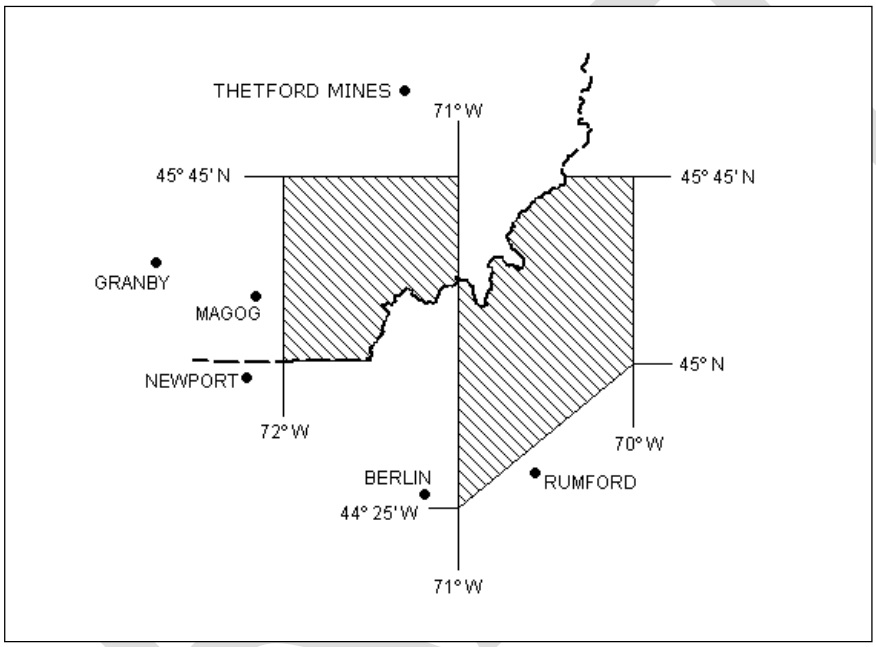
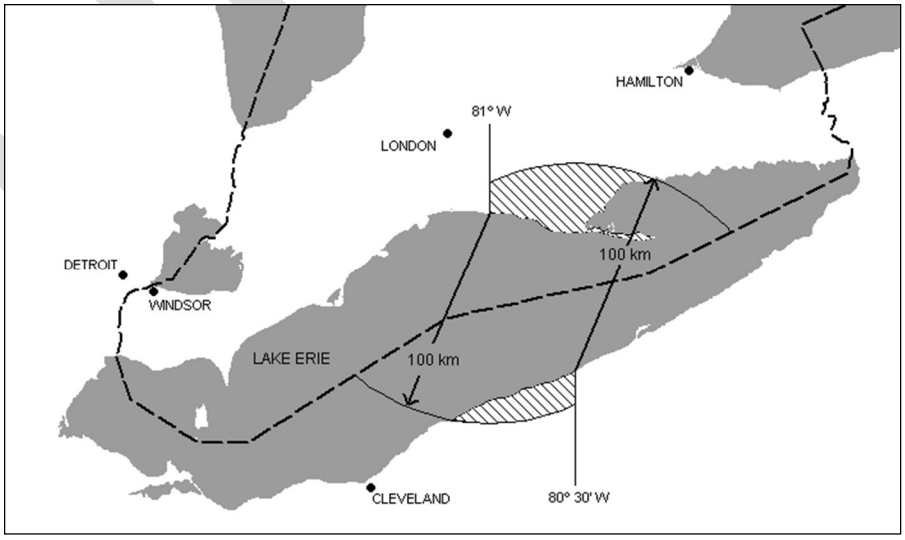


Figure C2



Annex D: Minimum separation distances for low altitude aircraft

TABLE D1
MINIMUM DISTANCES TO U.S.-CANADA BORDER FOR LOW ALTITUDE AIRCRAFT

Editor's note: A new cross-border Arrangement, superseding Arrangement Q, is likely to be published prior to the publication of SRSP-511 Issue 3. Once the new Arrangement is in force, this section will be removed or modified in favour of a reference to the new Arrangement.

Maximum Altitude of Aircraft Above Ground	Operating on a Channel	Aircraft Transmitting on Base Side of the Channel Pair (769-775 MHz)		Aircraft Transmitting on Mobile Side of the Channel Pair (799-805 MHz)
		Sharing Zones I and III	Sharing Zone II	All Sharing Zones
Up to 305 meters	Primary to its home country at all locations within its area of operation.	0 km from the border	0 km from the border	40 km from the border
	Primary to the other country at any locations within its area of operation.	100 km from the border	140 km from the border	140 km from the border
Above 305 meters and up to 457 meters	Primary to its home country at all locations within its area of operation.	0 km from the border	0 km from the border	60 km from the border
	Primary to the other country at any locations within its area of operation.	100 km from the border	140 km from the border	160 km from the border
Above 457 meters to 914 meters	Primary to its home country at all locations within its area of operation	0 km from the border	0 km from the border	80 km from the border

	Primary to the other country at any locations within its area of operation.	100 km from the border	140 km from the border	180 km from the border