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Spectrum Management and Telecommunications

Proposed Spectrum Utilization Policy, Technical and Licensing Requirements to Introduce Dedicated Short-range Communications-based Intelligent Transportation Systems Applications in the Band 5850-5925 MHz

Department of Industry

Radiocommunication Act

Notice No. DGTP-003-07 — Proposed Spectrum Utilization Policy, Technical and Licensing Requirements to Introduce Dedicated Short-range Communications-based Intelligent Transportation Systems Applications in the Band 5850-5925 MHz

Intent

The purpose of this notice is to announce the release of the above-mentioned document which seeks comments on proposals to establish the spectrum policy, technical and licensing provisions to accommodate Dedicated Short-range Communications (DSRC) in support of Intelligent Transportation Systems (ITS) in the band 5850-5925 MHz.

Background

DSRC systems are being designed to provide short-range, wireless links to transfer information between vehicles and roadside units, other vehicles, or portable roadside units. DSRC is anticipated to be essential to many ITS applications that improve traveller safety, decrease traffic congestion, facilitate the reduction of air pollution and help conserve fossil fuels.

Examples of such information transfer include: traffic light control, traffic monitoring, travellers' alerts, automatic toll collection, traffic congestion detection, emergency vehicle signal pre-emption of traffic lights and electronic inspection of moving trucks through data transmissions with roadside inspection facilities.

In Canada, research and development activities and deployment of ITS are being undertaken by federal, provincial and municipal governments, as well as industry groups, service operators, and the academic community. In the forefront of these activities are [ITS Canada](http://www.itscanada.ca) (<http://www.itscanada.ca>) and [Transport Canada](http://www.tc.gc.ca/eng/menu.htm) (<http://www.tc.gc.ca/eng/menu.htm>).

Recognizing the importance of safety and efficiency to Canada's transportation infrastructure, Industry Canada announced the addition of a mobile allocation and designated the band 5850-5925 MHz for use by DSRC-based ITS applications. The department received comments which supported this allocation and designation, and was further encouraged to undertake a full consultative review of the band.

Submitting Comments

Interested parties are invited to submit [comments](#) on the proposals outlined in the consultation no later than June 29, 2007, in electronic format (WordPerfect, Microsoft Word, Adobe PDF or ASCII TXT) to the following e-mail address: wireless@ic.gc.ca, along with a note specifying the software, version number and operating system used.

Written submissions should be addressed to the Director, Spectrum and Radio Policy, Telecommunications Policy Branch, Industry Canada, 1604A, 300 Slater Street, Ottawa, Ontario, K1A 0C8.

All submissions should cite the *Canada Gazette*, Part I, publication date, the title, and the notice reference number (DGTP-003-07).

Obtaining Copies

Copies of this notice and documents referred to herein are available electronically on the [Spectrum Management and Telecommunications website](#) at: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/Home>.

Official versions of *Canada Gazette* notices can be viewed on the [Canada Gazette website](#) at: <http://www.gazette.gc.ca/index-eng.html>. Printed copies of the notices can be ordered by calling the sales counter of Canadian Government Publishing at (819) 941-5995 or 1 800 635-7943.

March 23, 2007

Leonard St-Aubin
Director General
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1. Introduction

The purpose of this paper, announced in *Canada Gazette* notice DGTP-003-07, is to initiate public consultation and invite comments on proposals to introduce Dedicated Short-range Communications (DSRC) systems in support of Intelligent Transportation Systems (ITS) applications in the band 5850-5925 MHz. This paper seeks comments on the definition and applications of DSRC-based ITS applications, as well as technical and licensing criteria.

2. Background

DSRC systems are being designed to provide short-range, wireless links to transfer information between vehicles and roadside units, other vehicles, or portable roadside units. DSRC is expected to be essential to many ITS applications that are expected to improve traveller safety, decrease traffic congestion, facilitate the reduction of air pollution and help conserve fossil fuels.

Examples of such information transfer include: traffic light control, traffic monitoring, travellers' alerts, automatic toll collection, traffic congestion detection, emergency vehicle signal pre-emption of traffic lights and electronic inspection of moving trucks through data transmissions with roadside inspection facilities.

In Canada, research and development activities and deployment of ITS are being undertaken by federal, provincial and municipal governments, as well as industry groups, service operators, and the academic community. These activities are lead by ITS Canada and Transport Canada.¹

Recognizing the importance of safety and efficiency to Canada's transportation infrastructure, along with the need to harmonize with the United States, the Department proposed designating 75 MHz of spectrum for ITS systems in the band 5850-5925 MHz in DGTP-008-04.² Comments were requested on the requirement to add a mobile allocation to the band to accommodate ITS applications and the requirement, if any, for a moratorium on the licensing of new fixed systems. General support was expressed for the addition of an allocation for the mobile service in the band 5850-5925 MHz as well as for the designation of the band for DSRC-based ITS applications; while others thought it premature.

In October 2004, Industry Canada (the Department) announced the addition of a mobile allocation and designated the band 5850-5925 MHz for use by DSRC systems to support Intelligent Transportation Systems applications in the fixed and mobile services. In June 2006, the Department also released a moratorium on the licensing of any new fixed systems in the band 5850-5925 MHz (Spectrum Advisory Bulletin, SAB-001-06).

¹ ITS Canada's website <http://www.itscanada.ca> and Transport Canada's website is at: <http://www.transportcanada.ca>.

² SP 3-30 GHz, *Revisions to Spectrum Utilization Policies in the 3-30 GHz Frequency Range and Further Consultation*, October 2004.

More than two years have elapsed since the announcement of the allocation and designation, and now the Department is proceeding with this consultation to introduce new DSRC-based ITS applications in the band 5850-5925 MHz.

3. Dedicated Short-range Communications (DSRC)

3.1 DSRC Definition

DSRC systems provide the critical communications link for intelligent transportation systems, which is a key enabling technology in reducing traffic fatalities. This link is in the form of vehicle-to-vehicle and vehicle-to-infrastructure communications. Lives could be saved by warning drivers of an impending dangerous condition or event in time to take corrective or evasive actions. For example, one life-saving DSRC-based ITS application is intersection collision avoidance. The intersection collision avoidance application is anticipated to use roadside speed and location sensing equipment, DSRC equipment, in-vehicle signing and trajectory computing and control electronics to help drivers avoid intersection collisions, the most prevalent type of traffic accidents.

The Department proposes the following definition for *Dedicated Short-range Communications Systems* as follows:

The use of radio techniques to transfer information over short distances between roadside and mobile radio units, between mobile units, and between portable and mobile units to perform operations related to the improvement of traffic flow, traffic safety, and other intelligent transportation systems applications in a variety of environments. DSRC systems may also transmit status and instructional messages related to the units involved.

This aligns with the approved Federal Communications Commission (FCC) definition for DSRC Services under Section 90.7 of the Commission's Rules.

3.2 DSRC Applications

There are eight groups identified as DSRC-based ITS applications including: travel and traffic management, maintenance construction operations, public transit management, electronic payment, commercial vehicle operations, emergency management, advanced vehicle safety systems, and information management. These applications also vary by category (public or private radio), by range (less than 15 metres, 15-100 metres, 100-400 metres, and 400-1000 metres) and by vehicle type (all vehicles, buses, trains, heavy trucks and emergency vehicles).

Examples within these groups include: electronic toll collection, transit vehicle signal priority, gas (fuel) payment, parking payment, electronic commerce, traffic information, management of public transportation and commercial vehicles, fleet management, work zone warning, road condition warning, weather information, and border crossing clearance.

Comments are sought on the proposed definition and applications.

3.3 DSRC Operations

The majority of DSRC-based ITS wireless transmissions are anticipated to occur either between vehicles or between a moving vehicle and a transceiver at a fixed location in a near line of sight, point-to-point, or point-to-multipoint configuration.

DSRC operations involve the following two types of DSRC devices: a *roadside unit* (RSU) and an *on-board unit* (OBU). An RSU is a DSRC transceiver and is normally mounted along a road or a structure such as an overpass. It may also be vehicle-mounted or portable, but is only operational when stationary. Portable RSUs might be used for temporary situations such as work zone warnings. An OBU is a DSRC transceiver that is vehicle-mounted or portable and can be operational while in motion or stationary. A portable OBU could be used at the scene of a car crash, for example.

RSUs and OBUs are expected to communicate using short-range, low-power data transmissions of limited duration. Specifically, an RSU broadcasts data to, or exchanges data with, an OBU in its *communication zone* and provides channel assignments and operating instructions to it. OBUs can either contend for time to transmit or are assigned a time to transmit on one or more radio frequency channels. Except where specifically excluded, OBU operation is permitted wherever vehicle operation or human passage is permitted. OBUs may communicate with RSUs or other OBUs.

A *control channel* is accessible throughout the country and establishes a communication link between an RSU and an OBU or between OBUs. OBUs are required to listen to the control channel every few hundred milliseconds to check for messages. When tuned to the control channel, all RSUs and OBUs listen by default for a transmission. If an RSU or an OBU attempts to transmit a message but detects the broadcast of another message on the control channel, it must wait before transmitting. An OBU or an RSU initiates a *request to send* (RTS) and the control channel grants time first to high priority messages, then to lower priority messages. If an RSU or an OBU leaves the control channel to communicate on a service channel, a timer, defined by mandatory data transfer time limits, is activated to indicate it should return to the control channel to listen for additional transmissions and distinguish between priority and non-priority messages. In this connection, the control channel implements the priority through a priority interruption capability. Specifically, the control channel operates using a set of rules to provide a *quality of service* (QoS) that includes access time, access priority, and channel capacity service to RSUs and OBUs.

4. Spectrum Utilization

4.1 Frequency Allocation

In Canada, the band 5850-5925 MHz is allocated on a primary basis to the fixed service, the mobile service and fixed-satellite (Earth-to-space) service. Amateur and radiolocation services are secondary in the band.

Below is an excerpt from the current *Canadian Table of Frequency Allocations*, released May 2005 and amended January 2006, for the band 5850-5925 MHz:

5 850-5 925 FIXED FIXED-SATELLITE (Earth to space) MOBILE Amateur Radiolocation 5.150 C39C

To ensure that DSRC systems have priority over fixed-satellite service (FSS) operations the Department proposed footnote C39C in SP 3-30 GHz in 2004. Comments from the FSS community supported the footnote indicating that no plans for the band were anticipated. Subsequently, the Department adopted the following footnote:

C39C (CAN-05) In the band 5 850-5 925 MHz the use of the fixed and mobile services has priority over the use of the fixed-satellite service. The use of the fixed-satellite service in this band shall be limited to applications that pose minimal constraints on the deployment of fixed and mobile service systems. An example of such an application would be the use of a small number of large aperture earth stations, taking into account existing and potential service areas for ubiquitous deployment of fixed and mobile service systems.

4.2 Treatment of Incumbent Services

Presently, there are approximately 500 fixed systems in the band 5850-5925 MHz, predominantly used to support major cellular route expansion in the adjacent bands. Other incumbents include the FSS, whose operators have indicated earlier, that they have limited use and no plans for expansion within the band. The band has been allocated to the mobile service and designated for future DSRC-based ITS applications.

Incumbents in this band have been aware of the impending changes since the initial DSRC-ITS designation and allocation changes made in October 2004 by the Department. The Department studied the relationship between DSRC-based ITS applications and fixed systems in the 5.9 GHz band, and understands that coordination may be difficult. As such, the Department has since released a moratorium on new fixed system assignments in the band 5.9 GHz.

Nevertheless, the Department does anticipate that the roll-out of new DSRC-based ITS applications will be gradual and proposes a “where necessary” transition policy to ensure proper displacement. The Department proposes that the earliest displacement date of any fixed assignment in the band will be January 2012. This and other details of the proposed transition policy are outlined in Appendix A.

Comments are sought on the proposed transition policy outlined in Appendix A.

4.3 Band Plan

The Department is proposing to adopt the following band plan to promote harmonization between Canadian and U.S. DSRC-based ITS applications based on the American Society for Testing and Materials (ASTM)-DSRC standard.³

		Ch 175 Service 20 MHz		Control Channel	Ch 181 Service 20 MHz			
Ch 170 Reserve 5 MHz	Ch 172 Service 10 MHz	Ch 174 Service 10 MHz	Ch 176 Service 10 MHz	Ch 178 10 MHz	Ch 180 Service 10 MHz	Ch 182 Service 10 MHz	Ch 184 Service 10 MHz	
5850-5855 MHz	5855-5865 MHz	5865-5875 MHz	5875-5885 MHz	5885-5895 MHz	5895-5905 MHz	5905-5915 MHz	5915-5925 MHz	

This band plan divides the 75 MHz of spectrum into eight channels: one 5 MHz reserve channel (channel 170), one 10 MHz control channel (channel 178), and six 10 MHz service channels (channels 172, 174, 176, 180, 182, 184, 175 and 181). Channels 174 and 176 and channels 180 and 182 can be combined to provide two 20 MHz service channels – channels 175 and 181, respectively.

It is expected that this will provide users with maximum flexibility to employ technologies effectively and to facilitate economies of scale.

In its recent *Memorandum Opinion and Order* (FCC 06-110) released July 2006, the FCC designated channel 172 exclusively for vehicle-to-vehicle safety communications for accident avoidance and mitigation, and safety of life and property applications. The FCC also designated channel 184 exclusively for high-power, longer distance communications to be used for public safety applications involving safety of life and property including road intersection collision mitigation.

Comments are sought on the proposed channelling plan and whether to adopt U.S. designations for channels 172 and 184.

³ This Standard may be subject to periodic revisions in the future and the Department retains discretion to make changes as deemed necessary.

5. Eligibility

By opening this spectrum to as wide a range of potential licensees as possible, the Department believes it will encourage new entry and investment, as well as entrepreneurial efforts, to develop new DSRC-based technologies and applications. Along with promoting economic opportunity and competition, it will also allow entities to increase the effectiveness of safety of life and property communications, foster interoperability and further transportation-related initiatives.

The Department proposes that eligibility not be restricted. However, for those who intend to operate as radiocommunication carriers, applicants must be able to demonstrate that they meet the eligibility criteria for radiocommunication carriers as set out in subsections 9 and 10 of the *Radiocommunication Regulations*. For more information, refer to Client Procedures Circular 2-0-15, *Canadian Ownership and Control* (CPC-2-0-15), as amended from time to time.⁴

The Department seeks comment on the proposal for open eligibility.

6. Canadian and U.S. Coordination

At this time, international agreements between Canada and the United States concerning the 5.9 GHz spectrum for ITS applications have not been established. Although the agreement between the Canadian Government and the FCC, *Agreement Concerning the Coordination and Use of Radio Frequencies Above Thirty Megacycles per Second*⁵, with Annex, as amended, applies to the band 5850-5925 MHz, no agreement is in place for the current ITS designation. Consequently, licensees may be subject to future agreements with the United States. Until such time as agreements with the U.S. become effective, the Department proposes to apply the same technical restrictions at the border that are used for operation between service areas, i.e. operations must not cause harmful interference across the border.

7. Licensing Issues

7.1 Canadian Overview: Radio and Spectrum Licences

There are three general processes for issuing radio authorizations in Canada, all of which may, in whole or in part, prove applicable for the authorization of wireless networks operating in the band 5850-5925 MHz. These processes are spectrum licensing, radio station licensing, and equipment certification, in the form of technical acceptance certificates, in order to provide exemption from the need to hold a radio or spectrum licence.

⁴ CPC 2-0-15 can be found on Industry Canada's Spectrum Management and Telecommunications website at: <http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/en/sf01763e.html>.

⁵ *Treaty Series 1962 No. 15 - Coordination and Use of Radio Frequencies* can be found at: <http://strategis.ic.gc.ca/epic/internet/insmt-gst.nsf/en/sf01238e.html>.

A spectrum licence may be issued to provide for the operation of specified radio frequencies or frequency blocks over a geographic area, while a radio station licence is generally issued to authorize the use of specific radio frequencies being transmitted and received at specific geographic locations. Additionally, radio apparatus may be certified as technically acceptable to be exempted from the requirement of a radio authorization. In accordance with the powers of the Minister under the *Radiocommunication Act*, with the issuance of a radio authorization, the Minister may also fix terms and conditions of the authorization including the services that the holder is authorized to provide.

Fees for spectrum and radio station licences are generally determined by the type of communications service being authorized in conjunction with the amount of the radio frequency spectrum that is being utilized. For spectrum licences, pursuant to section 19 of the *Department of Industry Act*, licence fees are developed following a public consultation process whereby interested parties and the general public are allowed the opportunity to review and comment on fee proposals. Fees for radio station licences are prescribed as per the *Radiocommunication Regulations*, and are applied on a per channel, per site basis in conjunction with the type of communications service being authorized and the geographical area being served.

7.2 U.S. Approach

In the U.S., the FCC adopted a non-exclusive geographic area licensing scheme, coupled with a post-licence registration requirement. Licensees receive non-exclusive geographic area licences authorizing operation on seventy of the seventy-five megahertz of the 5.9 GHz band. This approach strikes a balance between the benefits of site-based licensing and the efficiencies and administrative convenience of geographic area licensing.

For governmental applicants, the licence area is based on the geo-political area encompassing the legal jurisdiction of the entity. All other applicants are issued a geographic area licence for their proposed area of operation based on county(s), state(s) or nationwide.

The FCC licences DSRC RSUs under Part 90 subpart M (“Intelligent Transportation Radio Service”) of the Commission’s Rules. The FCC requires DSRC licensees to register their RSUs on a site basis. Operation of RSUs may not begin until licensees register sites, channels, and other relevant data in the FCC’s Universal Licensing System (ULS). RSU licensees are required to notify the Commission of the date when the licensee constructs and places an RSU into operation. A twelve-month construction period is given. RSUs located within 75 kilometres of government radar sites are also subject to National Telecommunications and Information Administration (NTIA) coordination. Operation may not begin until NTIA approval is received.

The FCC also licences OBUs by rule under subpart L of Part 95 (personal radio service) of the Commission’s rules. DSRC OBUs are permitted to operate anywhere where Citizen’s Band (CB) station operation is permitted and must comply with the ASTM standard.

7.3 Licensing Discussion

7.3.1 Radio Authorizations

When deciding on the most appropriate type of radio authorization for DSRC-based ITS applications in the band 5850-5925 MHz the Department must balance the ease with which users may roll out their networks (i.e. promoting the use of spectrum) with providing an appropriate level of certainty that these networks can operate with minimum interference. Given the anticipated applications and operations of DSRC in the band 5850-5925 MHz the appropriate radio authorization procedure must be able to accommodate radio systems with numerous low-power fixed and portable stations.

The Department sees several potential disadvantages to the issuance of radio licences for fixed and portable RSUs. It is noted that managing and administering a radio station licensing regime can be very cumbersome and inefficient for radio systems comprised of several hundred low power transmitter sites. It is further noted that the radio station licensing regime deprives licensees of the flexibility to relocate fixed transmitter sites within a defined service area in a timely fashion, as they must obtain prior approval from the Department. All licensees would be required to be licensed for the control channel in addition to specific service channels.

In contrast, there are several potential advantages to spectrum licensing for DSRC-based ITS applications. Under spectrum licensing, the holder is authorized to operate the frequencies assigned within a defined geographic service area. The licensee may quickly modify, move, or add to its facilities within the specified geographic area without the need for prior approval from the Department (they are still required, however to supply the Department with minimal technical information on these site modifications). This not only increases a licensee's flexibility to manage its spectrum resource, it also reduces unnecessary administrative burden and operating costs. Spectrum licences also facilitate interoperability and operational standards while allowing economies of scale that encourage the development of low-cost equipment. For more information on spectrum licences please see Client Procedures Circular 2-1-23, *Licensing Procedure for Spectrum Licences for Terrestrial Services* (CPC-2-1-23).

The future use of the band 5850-5925 MHz will likely need to accommodate radio systems that transfer data over short distances between roadside and mobile units, mobile to mobile units and portable and mobile units. Recognizing the potential for the use of both communications services and wireless devices and, given the envisaged use of the band, the Department invites comments on the most appropriate methods for licensing.

The Department seeks comments on this or any other potential method for licensing DSRC-based ITS applications in the band 5850-5925 MHz.

7.3.2 Service Areas

When establishing geographic service areas, the Department must balance the competing need to provide large enough service areas with the need to permit the dissemination of licences among a wide variety of applicants. The Department also wishes to ensure service to rural areas and to promote investment in, and rapid deployment of, new technologies and services.

Over the past several years the Department has developed a four-tier service area structure applicable for spectrum licensing through the application of a competitive licensing process. While the tier system provides a ready and standardized scheme for describing geographical licence areas, the Department will consider other options for defining the geographic area to be licensed.

Comments are invited and should articulate the most appropriate process to determine geographical service areas for DSRC licensees.

7.4 Licensing OBUs and RSUs

As outlined in previous sections, OBUs are flexible devices that allow communication with RSUs and other OBUs. They can be tied to a specific DSRC system or may operate in an open non-aligned manner. As previously noted, in the U.S., OBUs are licensed by rule under subpart L of Part 95 of the Commission's rules. As a result, individual licensing of OBUs is not required and they are permitted to operate within the geographical area of any ITS network provided they comply with the ASTM standard. It is likewise anticipated that a similar authorization approach would be used in Canada and licensing of OBUs will not be required, provided the equipment being operated complies with the applicable ASTM standard.

Similar to the situation in the U.S., it is anticipated that in order to operate site-based RSUs, an entity must first obtain a DSRC authorization and pay the appropriate licence fee for the geographical area authorized. It is also anticipated that once a DSRC licence for an RSU has been obtained, licensees may be required to register and coordinate site based transmitter locations prior to commencing operation. As a condition of licensing, RSU equipment would also be required to comply with the applicable ATSM standard.

7.5 Licence Fees

The radio frequency spectrum supports a wide range of business, industrial, scientific, medical, research, personal and cultural activities, in both the private and public sectors.

In Canada, all public sector licensees are charged fees for their use of the radio frequency spectrum on the same basis as private sector licensees, in order to promote the use of the spectrum resource in an economically efficient manner. This also ensures that the public sector decision makers are aware of the full cost of the inputs consumed versus the benefits gained; it avoids cross subsidization amongst levels of government; and avoids distorting choices in the provision of radiocommunication services (e.g. undermining the provision of services by the private sector).

At this point in time, it is the view of the Department that proposing a spectrum licence fee is premature and will be the subject of a future public consultation on fees.

7.6 Conditions of Licence and Ministerial Authority

Conditions of licence will be established through a future public consultation process.

8. Technical Rules

8.1 ASTM Standard

The ASTM-DSRC standard, is based on the IEEE 802.11a standards, and was developed by the ASTM through the Standards Writing Group. It was approved on July 10, 2003 and published in September 2003.

The ASTM-DSRC standard describes a *medium access control layer* (MAC) and *physical layer* (PHY) specification for wireless connectivity using DSRC services. The ASTM standard enables wireless communications over short distances between information sources and transactions between stations on the roadside and mobile radio units, between mobile units, and between portable units and mobile units. DSRC operations generally occur over line of sight distances of less than 1000 metres between roadside units and mostly high speed (up to 120 mph), but occasionally stopped and slow moving, vehicles or between high speed vehicles.

The U.S. requires that all DSRC operations in the band 5.9 GHz comply with the ASTM-DSRC standard. No alternative standard or other technical rules would achieve both interoperability and allow open eligibility. The use of the ASTM-DSRC standard requires compliance with certain technical parameters, such as power limits and receiver performance specifications.

The Department believes that mandating the use of equipment that meets the ASTM-DSRC standard will help ensure that an adequate and efficient market develops. If this service is to succeed in facilitating rapid deployment of ITS technologies to improve the safety of our country's roadways, all DSRC licensees should be required to use only ASTM-DSRC compliant equipment.

Comments are sought on the applicability of the ASTM-DSRC standard and the degree to which the equipment should be compliant.

8.2 Power Limits

The Department is proposing power limits of the ASTM-DSRC standard as shown below.

- a. Public safety RSU installations operating in DSRC channel 172 are designated for applications involving safety of life and property. RSU installation transmissions in DSRC channel 172 shall not exceed 33 dBm e.i.r.p.
- b. Private RSU installations operating in DSRC channels 174, 175 and 176 are used to implement small and medium range operations. RSU installation transmissions in DSRC channels 174, 176 shall not exceed 28.8 dBm antenna input power and 33 dBm e.i.r.p. RSU installation transmissions in DSRC channel 175 shall not exceed 10 dBm antenna input power and 23 dBm e.i.r.p.
- c. Public safety RSU installation transmissions in DSRC channel 178 shall not exceed 28.8 dBm antenna input power and 44.8 dBm e.i.r.p. Private RSU installation transmissions in DSRC channel 178 shall not exceed 28.8 dBm antenna input power and 33 dBm e.i.r.p.
- d. The DSRC channels 180, 181, and 182 are used to implement small zone operations. Public safety and private RSU installations in these DSRC channels shall not exceed 10 dBm antenna input power and 23 dBm e.i.r.p. These installations shall use an antenna with a minimum 6 dBi gain. Interfering emissions from an RSU installation in these DSRC channels shall not exceed a maximum received power level of -76 dBm at 15 m from the installation being evaluated. The received power level is measured at 1.2 m above the ground with a 0 dBi antenna.
- e. Public safety RSU and OBU operation in DSRC channel 184 is designated for public safety applications involving safety of life and property. Public safety RSU and OBU operations in DSRC channel 184 shall not exceed 28.8 dBm antenna input power and 40 dBm e.i.r.p.
- f. Private OBU operations in DSRC channels 174, 176, and 178 shall not exceed 28.8 dBm antenna input power and 33 dBm e.i.r.p. Private OBU operations in DSRC channel 175 shall not exceed 10 dBm antenna input power and 23 dBm e.i.r.p. Private OBU operations in DSRC channels 180, 181, and 182 shall not exceed 20 dBm antenna input power and 23 dBm e.i.r.p.
- g. Public safety OBU operations in DSRC channels 172, 174, and 176 shall not exceed 28.8 dBm antenna input power and 33 dBm e.i.r.p. Public safety OBU operations in DSRC channel 175 shall not exceed 10 dBm antenna input power and 23 dBm e.i.r.p.
- h. Public safety OBU operations in channel 178 shall not exceed 28.8 dBm antenna input power and 44.8 dBm e.i.r.p.
- i. RSUs and OBUs shall transmit only the power needed to communicate over the distance required by the application being supported.

Comments are sought on the ASTM-DSRC standard above and its application in Canada noting that it segregates public safety applications and private use.

The Department retains discretion to revisit these limits at such time as the ASTM E17.51 DSRC Standards Writing Group may determine that revisions are necessary.

8.3 Certification of Equipment

All radio equipment must be certified by the Department. The Department will release a Radio Standards Specification (RSS) at a later date to specifically address this issue. Out-of-band emission limits will also be specified.

Issued under the authority
of the Radiocommunication Act

Leonard St-Aubin
Director General
Telecommunications Policy Branch

Appendix A - Proposed Transition Policy Provisions for the Displacement of Existing Fixed Assignments in the Band 5850-5925 MHz

General Transition Policy Principles

The *Spectrum Policy Framework for Canada* (2002) outlines, among other things, the policy guidelines dealing with the allocation of spectrum resources and the displacement of radio systems. The policy, formulated under the *Radiocommunication Act* and *Radiocommunication Regulations*, states that:

“The radio frequency spectrum, as a national public resource, will be allocated and planned to advance public policy objectives, while ensuring a balance between public and private radiocommunication use to benefit Canadians. The reallocation of, and access to, the spectrum resource will be adapted to meet changing user requirements, to provide spectrum that best meets the needs of the user and to facilitate the deployment of new and innovative services.”

Moreover, the policy reconfirms that there is no liability or responsibility or intent by the Department to financially compensate spectrum users being displaced. Furthermore, as new services have been introduced, it has not been the practice of Industry Canada to ask new radio users to compensate existing users who are displaced. Of course, private arrangements may be made between new radio users and existing users on a voluntary basis, within the provisions of the spectrum transition policy.

Proposed Transition Policy Provisions

The Department proposes the following provisions to provide a reasonable notification period for the displacement of fixed microwave assignments and allow for the timely deployment of new Dedicated Short-range Communications (DSRC) systems, specifically roadside units (RSUs), in the band 5850-5925 MHz. DSRC licensees authorized under the proposed non-exclusive process will be able to invoke the transition policy provisions to ensure timely access to spectrum.

These provisions for displacement will apply to incumbent fixed service stations in the band 5850-5925 MHz. The incumbents and associated station data can be found on the Spectrum Direct website at <http://sd.ic.gc.ca> in the Radio Frequency Search section.

The provisions below advocate a “where necessary displacement” approach that links the displacement of fixed assignments to DSRC system implementation and spectrum requirements. The proposed provisions are as follows:

1. Once the final policy on the band 5850-5925 MHz has been released, the Department will be in a position, on behalf of the licensee(s), to issue formal notifications to the incumbent licensees for the displacement of affected fixed frequency assignments on an as-required basis.
2. The displacement of existing fixed frequency assignments and the dates indicated in the Department’s notifications will be based on the minimum notification periods outlined in provision 3 and be for the spectrum necessary for the implementation of DSRC systems. DSRC operators will ensure that such displacements are required for service implementation.

3. Following the issuance of DSRC licences for the band 5850-5925 MHz, existing fixed stations affected by the implementation of DSRC systems will be afforded a minimum notification period of two years for those systems operating in rural areas, and one year for those operating in urban areas⁶ which have a population of 25,000 or more. The earliest date of displacement will be January 2012.
4. Fixed station operators will cease operation of the identified frequency assignments on or before the date in the served notification.
5. Earlier displacement than the formal notification date may be achieved through mutually acceptable arrangements between the DSRC operator(s) and the affected fixed operator(s).
6. In addition to provision 3 above, existing Canadian fixed station assignments operating in the band 5850-5925 MHz are afforded interference protection from U.S. RSU operations, according to FCC regulations Part 90 Section 90.383 until such time that an alternate arrangement is finalized between Canada and the United States.
7. Industry Canada will retain oversight of the displacement process and will assist, where appropriate, affected fixed operators in identifying new replacement frequency assignments.
8. In the event the DSRC operator(s) needs to defer a notified displacement date, an amendment to the date should be identified to the Department as early as possible.
9. Industry Canada will monitor the effectiveness of the spectrum policy provisions related to the displacement of fixed systems. In the long term, changes to these provisions and/or licence conditions may be made to ensure that the continued availability of spectrum for DSRC systems is accomplished in the most efficient manner.

⁶ Urban areas are defined in the Statistics Canada *Census Dictionary* and in *A National Overview - Population and Dwelling Counts* (data products: 2001 Census of Canada).