Industry Canada

SP 23/38 GHz
September 1996

Spectrum Management

Spectrum Utilization Policy

Spectrum Policy and Licensing Considerations, Fixed Radio Systems in the 23 GHz and 38 GHz Frequency Bands

Amended by:

DGTP-005-99/ DGRB-003-99 Policy and Licensing Procedures for the Auction of the 24 and 38 GHz Frequency Bands (May 1999)

Note: See also the Decision on the Renewal of 24 and 38 GHz Spectrum Licences and Consultation on Spectrum Licence Fees for 24, 28 and 38 GHz Bands, issued in March 2009

Canada

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DEPARTMENT OF INDUSTRY

RADIOCOMMUNICATION ACT

NOTICE NO. DGTP-007-96

SPECTRUM POLICY AND LICENSING CONSIDERATIONS, FIXED RADIO SYSTEMS IN THE 23 GHz AND 38 GHz FREQUENCY BANDS

This notice announces new microwave spectrum utilization policies for the deployment of fixed radio facilities in the 23 GHz and 38 GHz bands with the release of the policy document entitled *Spectrum Policy and Licensing Considerations, Fixed Radio Systems in the 23 GHz and 38 GHz Frequency Bands*. Also Industry Canada invites public comments with regard to the definition of licensing areas for frequency block assignments and the proposed licensing fees.

In early 1995, Industry Canada solicited public comments on the use of the radio spectrum in certain bands above 20 GHz (e.g. 23, 28 and 38 GHz). This consultation, initiated through Canada Gazette Notice DGTP-013-94, focussed on specific radio service applications including fixed systems for emerging local carriages.

The Department invited comments on the use of the band 21.2-21.8/22.4-23.0 GHz and the 36-40.5 GHz band for innovative fixed service applications. Fourteen of the twenty-five submissions received on DGTP-013-94 addressed the use of these bands.

The Canadian telecommunication industry has indicated their strong support for the opening of frequency bands near 23 GHz and 38 GHz to provide new fixed service applications for broadband local wireless facilities. The recent release of the PCS policy and subsequent awarding of licences has generated some urgency to identify suitable spectrum above 20 GHz for PCS (and cellular) cell site network support and possibly other PCS network components including backbone/backhaul facilities. In addition, since the release of the consultation document DGTP-013-94, it has become apparent that there is interest by existing and new service providers in developing wireless access facilities using point-to-point and point-to-multipoint systems in these frequency ranges.

The new 23 GHz and 38 GHz spectrum policies will be consolidated in the package of microwave utilization policies, released in January 1995, entitled *REVISIONS TO THE MICROWAVE SPECTRUM UTILIZATION POLICIES IN THE RANGE OF 1-20 GHz, (SP 1-20 GHz).*

This document entitled **Spectrum Policy and Licensing Considerations, Fixed Radio Systems in the 23 GHz and 38 GHz Frequency Bands** is available electronically via the Internet at the following addresses:

Anonymous file transfer (FTP)
info.ic.gc.ca/pub/ic-data/telecom/gazette

Gopher
info.ic.gc.ca port 70/Industry Canada Documents/
telecom/gazette

World Wide Web (WWW)
http://info.ic.gc.ca/ic-data/telecom/telecom-e.html

Submissions in response to Section 6.0 of the policy document should be addressed to the Director General - DGRB, Industry Canada, 300 Slater Street, Ottawa, Ontario, K1A 0C8 and must be received on or before October 22, 1996 to receive full consideration. All representations should cite the Canada Gazette Part 1 Notice publication date, title, and the Notice reference number.

Written comments received in response to this Notice will be made available for viewing by the public two weeks after the closing date of this Notice, during normal business hours, at the Industry Canada Library, 365 Laurier Ave. West, Ottawa, and at the offices of Industry Canada at Moncton, Montréal, Toronto, Winnipeg and Vancouver, for a period of one year from the close of the comment period.

Copies of the subject document are also available from the Communications Branch, Industry Canada, 235 Queen Street, Ottawa, Ontario K1A 0H5, (613) 947-7466, and from the offices of Industry Canada at Moncton, Montréal, Toronto, Winnipeg and Vancouver.

Dated at Ottawa this 28th day of August, 1996.

Larry Shaw
Acting Director General
Telecommunications Policy Branch

1. Introduction

The purpose of this policy statement is to make spectrum available for the deployment of fixed microwave radio facilities in the 23 GHz and 38 GHz frequency bands.

2. Background

In early 1995, Industry Canada solicited public comments on the use of the radio spectrum in certain bands above 20 GHz (e.g. 23, 28 and 38 GHz). This consultation, initiated through Canada Gazette Notice DGTP-013-94, focussed on specific radio service applications including the following:

- Local multipoint communication systems (LMCS), for the distribution of a wide variety of services, such as interactive video, broadcasting, multimedia, voice, narrowband and broadband data services to Canadian households and businesses;

- Fixed point-to-point radio systems for emerging local carriages including backbone/backhaul facilities for the Personal Communications Service (PCS).

The policy consultation was to take into account the spectrum needs for feeder links for non-geostationary mobile satellite networks, and future advanced communication satellites in the 28 GHz range.

On February 29, 1996, Industry Canada released a new policy and call for applications for the implementation of Local Multipoint Communication Systems (LMCS) in the frequency range 25.35-28.35 GHz, noting that initial implementation will be in the band 27.35-28.35 GHz. These systems, typically requiring 500-1000 MHz of spectrum, will operate as local common carrier facilities and will accommodate a wide range of basic and advanced telecommunications, multimedia and broadcasting services.

The Department has responded to the need for mobile satellite feeder links and advanced satellite communications through separate actions, including the preparations for the 1995 World Radiocommunication Conference (WRC-95). Canada was successful at WRC-95 in having the ITU designate sufficient spectrum for feeder links in the C and Ka bands while ensuring the availability of spectrum for advanced satellite applications. In the near future the Department will issue proposals for consequential amendments to the *Canadian Table of Frequency Allocations*.

The remaining item from the consultation process, fixed radio facilities, is the subject of this policy document. The Department invited comments on the use of the band 21.2-21.8/ 22.4-23.0 GHz and the 36-40.5 GHz band for innovative fixed service applications. Fourteen of the twenty-five submissions received on DGTP-013-94 addressed the use of these bands.

The Canadian telecommunication industry has indicated their strong support for the opening of frequency bands near 23 GHz and 38 GHz to provide new fixed service applications. The

recent release of the PCS policy and subsequent awarding of licences has generated some urgency to identify suitable spectrum above 20 GHz for PCS (and cellular) cell site network support and possibly other PCS network components including backbone/backhaul facilities. In addition, since the release of the consultation document DGTP-013-94, it has become apparent that there is interest by existing and new service providers in developing wireless access facilities using point-to-point and point-to-multipoint systems in these frequency ranges.

3. Discussion

The nature of microwave point-to-point systems has evolved considerably over the past 10 years. Existing medium and long haul transmission systems have in many cases moved from radio based technologies to optical cable technology, in order to meet burgeoning capacity requirements. On the other hand, the new competitive telecommunication environment has provided many opportunities for new service providers. In many cases the new entrants have elected to develop microwave point-to-point systems for economic and deployment timing reasons.

Since the introduction of cellular radio systems in the mid 80's, there has been a continued growth in microwave communication systems as a key component of the cellular backbone network. The cellular deployment of new point-to-point microwave facilities has outpaced all other uses of microwave facilities in the last 10 years and as cellular systems expand, so does their use of higher microwave frequency bands which has traditionally been in bands below 20 GHz.

With the introduction of broadband PCS in the 2 GHz band there is now a further need to find radio spectrum to support interconnection of cells within urban areas. In the case of PCS, the cells vary in size; some small enough to be contained within the floor of a building or at a street intersection; some considerably larger, comparable to cellular. Equipment manufacturers have developed new lines of short range, rapid deployment, microwave equipment in frequency bands above 20 GHz which meet the backbone/backhaul requirements of PCS and cellular systems and emerging high speed digital access requirements for business.

Industry Canada recognizes the need to provide radio spectrum above 20 GHz to support emerging applications such as fixed wireless access and private data networks. Given the phenomena of the expanding use of the Internet and other computer networks, service providers are racing to provide high speed digital communications to business and residential subscribers. Industry experts have indicated that the data transmission speeds will have to increase to support continued growth of computer networks.

Telecommunication service providers have more recently expressed interest in multipoint communications system (MCS) technology to provide wide access to clients for delivery of a full range of voice and data services. MCS equipment can take advantage of the propagation characteristics and available bandwidth found in spectrum above 20 GHz to support wireless access applications to a large number of users.

In the consultation process respondents suggested that there is need to move away from the conventional fixed service frequency assignment methods and technical requirements. The general direction that was supported by the respondents is as follows:

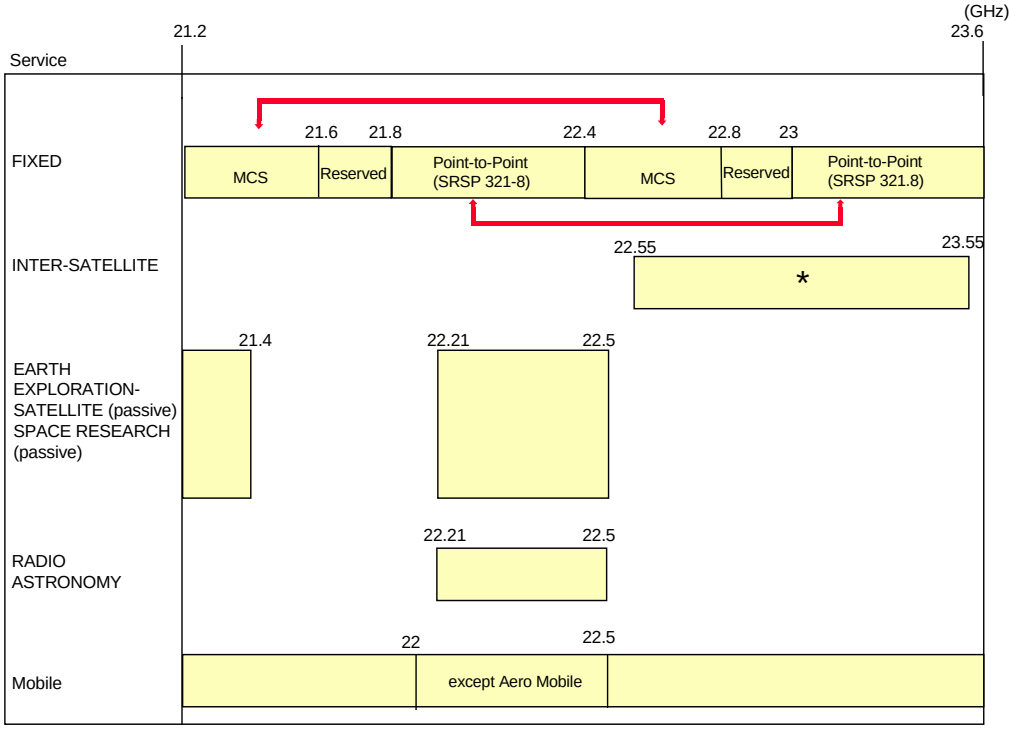
1. Spectrum blocks should be made available to users, on a self-managed basis, to permit the rapid deployment of communication facilities.

2. The technical and operational constraints on the use of spectrum blocks should be minimal, allowing flexibility to the licensee to meet particular service demands in the most efficient and economic manner.

3. Assignment of the blocks of spectrum should be over a given service area(s) and not subject to site-by-site authorization.

Given the variety of applications that could emerge employing both point-to-point and point-to-multipoint technologies, Industry Canada will provide sufficient spectrum in the 23 GHz and 38 GHz frequency bands to accommodate that diversity. In addition, the Department recognizes the need to update existing policies and standards for the current fixed service band in the 23 GHz range to ensure the spectrum is used in the most efficient manner.

4. Spectrum Utilization Policy for the 23 GHz Frequency Band



* Inter-satellite links of low-earth orbitting mobile satellites

Currently, the paired frequency bands 21.8-22.4 GHz and 23-23.6 GHz are available for use by point-to-point fixed systems under the provisions established in the spectrum utilization policy SP 1-20 GHz and the standard radio systems plan SRSP 321.8. The policy and technical standards for the use of this spectrum permit a wide variety of applications operating under minimal technical restrictions. It has been recognized by microwave manufacturers and service providers that a review of SRSP 321.8 is necessary in order to facilitate new product lines and to ensure that the spectrum is used in the most efficient manner.

Industry Canada concurs with the proposal to review and revise SRSP 321.8. The Department assessed the current usage of the bands 21.8-22.4 GHz and 23-23.6 GHz and has concluded that nearly all channels are lightly used in metropolitan areas. Consequently the planned updating of the technical standards for the existing bands should provide sufficient opportunity for deployment of point-to-point systems in this frequency range for the foreseeable future.

Emerging technology trends in the frequency bands above 20 GHz suggest that some spectrum should be available to service providers to develop a variety of business opportunities and implement new technology within exclusively licensed spectrum blocks.

Industry Canada recognizes that competition in the telecommunication industry will continue to unfold creating new wireless service opportunities for Canadian companies. In support of this new environment, new radio spectrum is being made available in the bands 21.2-21.6 GHz and 22.4-22.8 GHz, for a wide variety of fixed service applications employing multipoint communication systems (MCS).

The spectrum in the bands 21.2-21.6 GHz and 22.4-22.8 GHz will be divided into 50 MHz paired blocks and each paired block will be assigned on an exclusive basis over an area. Increased flexibility is provided through a block assignment structure, where operators will have considerable freedom to use the spectrum within their licensed blocks to suit their particular business needs. There will be a limit on the maximum number of paired blocks assigned to each licensee in any area, in order to provide equitable access to the available spectrum,

The Department is of the view that the remaining spectrum in the bands 21.6-21.8 GHz and 22.8-23 GHz should not be designated for use at this time. Therefore, this spectrum is held in reserve. These bands could be available for point-to-point and/or multipoint systems at a later date, depending on the emerging demands and the rate at which spectrum is depleted in the adjacent bands.

The specific spectrum utilization policy provisions are as follows:

4.1 A full description of the relationship between frequency bands and services, as contained in related international and domestic footnotes, can be found in the Canadian Table of Frequency Allocations.

4.2 The use of the existing bands 21.8-22.4 GHz and 23.0-23.6 GHz by the fixed service:

4.2.1 These paired bands are designated for point-to-point microwave systems.

4.2.2 The permitted transmission capacity, as defined in SP 1-20 GHz, is low, medium and high capacity. (See Annex A)

4.2.3 The technical standards within the Standard Radio System Plan (SRSP 321.8) should be revised to improve the efficient use of this band. Until a new SRSP is adopted, all licensing of new microwave systems in these bands will be on non-standard basis.

4.3 The use of the new bands 21.2-21.6 GHz and 22.4-22.8 GHz by the fixed service:

4.3.1 The paired bands 21.2-21.6 and 22.4-22.8 GHz are designated for multipoint communication systems (MCS).

4.3.2 The permitted transmission capacity, as defined in SP 1-20 GHz, is low, medium and high capacity. (See Annex A)

4.3.3 The spectrum is assigned on a paired block basis, as follows:

Block A/A'	21 200 - 21 250 MHz	22 400 - 22 450 MHz
Block B/B'	21 250 - 21 300 MHz	22 450 - 22 500 MHz
Block C/C'	21 300 - 21 350 MHz	22 500 - 22 550 MHz
Block D/D'	21 350 - 21 400 MHz	22 550 - 22 600 MHz
Block E/E'	21 400 - 21 450 MHz	22 600 - 22 650 MHz
Block F/F'	21 450 - 21 500 MHz	22 650 - 22 700 MHz
Block G/G'	21 500 - 21 550 MHz	22 700 - 22 750 MHz
Block H/H'	21 550 - 21 600 MHz	22 750 - 22 800 MHz

4.3.4 Paired frequency blocks are assigned within a geographical area and any paired block will be assigned only once in a given area.

4.3.5 The paired frequency blocks will be assigned according to the size of the service area. Operators requiring large service areas, employing multiple hub sites, covering a metropolitan area, will be assigned the lowest available block pair. Conversely, where a small service area is required, employing only a few hub sites, the highest available block pair will be assigned. In this case, every effort will be made to re-use the highest block pairs in metropolitan areas. To ensure that the spectrum is used efficiently, the Department will give assignment preference to applicants requiring large service areas.

4.3.6 Licensees are permitted to use any channelling arrangement within the assigned block(s) of spectrum.

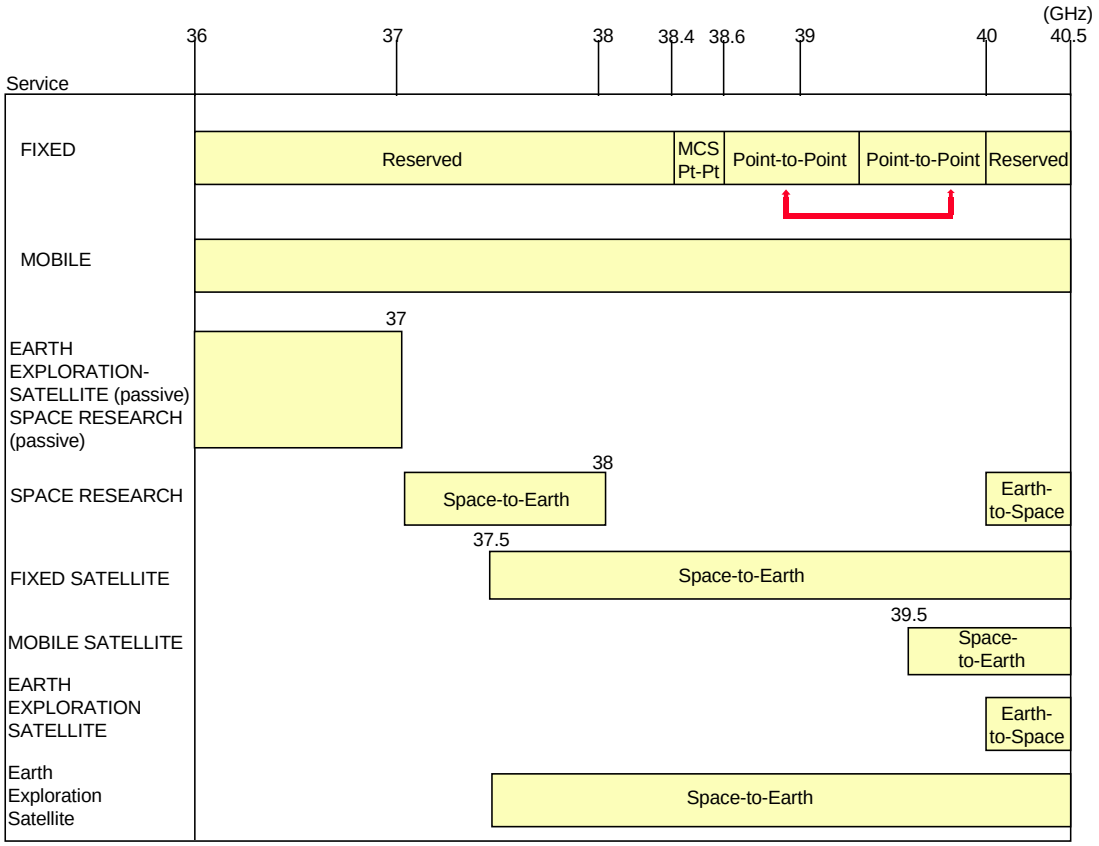
4.3.7 Licensees are limited to one (1) paired block in a given area. A second paired block may be granted to a licensee on a case by case basis.

4.3.8 Asymmetrical forward/return transmission rates are permitted provided that either the forward or return direction does not exceed 50% of the assigned spectrum. For example, for a single block pair an operator may not exceed 50 MHz in the forward direction.

4.3.9 Point-to-point fixed service links are also permitted on a limited basis in these bands. Such use should be complementary or incidental to the deployment of multipoint systems. Point-to-point links in a hub configuration are also permitted.

4.3.10 The Geographical Differences Policy, as outlined in SP 1-20 GHz, does not apply.

5. Spectrum Utilization Policy for the 38 GHz Frequency Band



Industry Canada is of the view that sufficient spectrum must be designated in the band 36-40.5 GHz to support a wide range of applications for a diversity of fixed service systems. Accordingly, 1600 MHz is made available for fixed systems in the band 38.4-40.0 GHz and the balance is being held in reserve until demand warrants the use of this spectrum. The band 38.6-40 GHz is designated for point-to-point fixed systems and the spectrum will be assigned on a paired block basis to provide deployment and equipment flexibility. Each paired block will be assigned on an exclusive basis in a given area. In addition, radio systems may be structured in a variety of ways including single and multiple hops, and hub site configurations. In order to ensure spectrum is available to a number of licensees, Industry Canada will limit the number of paired blocks assigned to each licensee in any given area.

The band 38.4-38.6 GHz is designated for one-way, point-to-point and multipoint systems. Similar to the 38.6-40 GHz band, it will be assigned by frequency blocks over a given area. Operating experience in other frequency bands has indicated that including one-way systems in paired spectrum designated for two-way systems does not always result in efficient use of spectrum.

The specific spectrum utilization policy provisions are as follows:

5.1 A full description of the relationship between bands and services, as contained in related international and domestic footnotes, can be found in the Canadian Table of Frequency Allocations.

5.2 The use of the new bands 38.6-39.3 GHz and 39.3-40.0 GHz by the fixed service:

5.2.1 These bands are designated for point-to-point microwave systems.

5.2.2 The permitted transmission capacity, as defined in SP 1-20 GHz, is low, medium and high capacity. (See Annex A)

5.2.3 The spectrum is assigned on a paired block basis as follows:

Block A/A’	38 600 - 38 650 MHz	39 300 - 39 350 MHz
Block B/B’	38 650 - 38 700 MHz	39 350 - 39 400 MHz
Block C/C’	38 700 - 37 750 MHz	39 400 - 39 450 MHz
Block D/D’	38 750 - 38 800 MHz	39 450 - 39 500 MHz
Block E/E’	38 800 - 38 850 MHz	39 500 - 39 550 MHz
Block F/F’	38 850 - 38 900 MHz	39 550 - 39 600 MHz
Block G/G’	38 900 - 38 950 MHz	39 600 - 39 650 MHz
Block H/H’	38 950 - 39 000 MHz	39 650 - 39 700 MHz
Block I/I’	39 000 - 39 050 MHz	39 700 - 39 750 MHz
Block J/J’	39 050 - 39 100 MHz	39 750 - 39 800 MHz
Block K/K’	39 100 - 39 150 MHz	39 800 - 39 850 MHz
Block L/L’	39 150 - 39 200 MHz	39 850 - 39 900 MHz
Block M/M’	39 200 - 39 250 MHz	39 900 - 39 950 MHz
Block N/N’	39 250 - 39 300 MHz	39 950 - 40 000 MHz

5.2.4 Paired frequency blocks are assigned within a geographical area and any paired block will be assigned only once in a given area.

5.2.5 The paired frequency blocks will be assigned according to the size of the service area. Operators requiring a large service area, such as a metropolitan area, will be assigned the lowest available block pair. In the case where the area to be served is relatively small compared to the metropolitan area the highest available block pair will be assigned. In this case, every effort will be made to re-use the highest block pairs amongst several users within a metropolitan area. To ensure that the spectrum is used efficiently, the Department will give assignment preference to applicants requiring large service areas.

5.2.6 Licensees are permitted to use any channelling arrangement within the assigned block(s) of spectrum.

5.2.7 Aggregation of paired spectrum blocks is permitted, however, licensees are limited to a maximum of two (2) paired blocks in any given area.

5.2.8 One way systems are not permitted.

5.2.9 Radio systems using analogue transmission are not permitted in these bands.

5.2.10 The Geographical Differences Policy, as outlined in SP 1-20 GHz, does not apply.

5.3 The use of the new band 38.4-38.6 GHz by the fixed service.

5.3.1 The frequency band 38.4-38.6 GHz is designated for one-way, point-to-point and one-way, multipoint communication systems (MCS).

5.3.2 The permitted transmission capacity, as defined in SP 1-20 GHz, is low and medium capacity. (See Annex A)

5.3.3 The spectrum is assigned on a block basis as follows:

Block A	38 400 - 38 450 MHz
Block B	38 450 - 38 500 MHz
Block C	38 500 - 38 550 MHz
Block D	38 550 - 38 600 MHz

5.3.4 Frequency blocks are assigned within a geographical area and any block will be assigned only once in a given area.

5.3.5 The frequency blocks will be assigned according to the size of the service area. Operators requiring a large service area, such as a metropolitan area, will be assigned the lowest available block. In the case where the area to be served is relatively small compared to the metropolitan area the highest available block will be assigned. In this case, every effort will be made to re-use the highest frequency blocks amongst several users within a metropolitan area. To ensure that the spectrum is used efficiently, the Department will give assignment preference to applicants requiring large service areas.

5.3.6 Licensees are permitted to use any channelling arrangement within the assigned block(s) of spectrum.

5.3.7 Licensees are limited to one (1) block in a given area. A second block may be granted to a licensee on a case by case basis.

5.3.8 Radio systems using analogue transmission are not permitted in these bands.

5.3.9 The Geographical Differences Policy, as outlined in SP 1-20 GHz, does not apply.

5.4 The use of the 36.0-38.4 GHz and 40-40.5 GHz bands by the fixed service.

5.4.1 With regards to fixed and mobile service applications, this spectrum is held in reserve.

5.4.2 No fixed service licences will be permitted, unless they are of an experimental nature.

5.4.3 The Department will consider opening these bands for fixed service applications when it is evident that sufficient demand exists for point-to-point or other types of fixed systems in this frequency range.

6. Licensing Considerations

6.1 General

Radio licensing of local fixed systems in the 23 GHz and 38 GHz bands shall be in accordance to the Radio Licensing Policy for Limited Area Radio Systems (DGTP-003-95). This policy applies equally to site licensing and non-site specific licensing of point-to-point and multipoint systems.

Non-paired and paired frequency blocks will be assigned to applicants on a first come, first served basis and in accordance with the conditions outlined in the spectrum policy sections of this document.

In certain areas, if it becomes evident that the spectrum available for authorization is not sufficient to meet the demand, the Department may proceed with a competitive bidding[1] process to award licences for the remaining blocks.

In order to fix a spectrum licence fee, the Minister wishes to consult with interested parties. During the consultation period, applicants who wish to provide service may apply to the Department for a radio authorization. This authorization will be valid only until the final licensing procedure comes into effect. The conditions and procedures

[1] Further licensing considerations can be found in Gazette Notice DGRB-001-96, entitled *Review of the Comparative Selection and Radio Licensing Process - Findings.*

associated with a radio authorization in the 23 GHz and 38 GHz bands are outlined in section 6.5.

6.2 Eligibility

Applicants intending to provide common carrier services must comply with the Canadian carrier eligibility criteria as set out in section 16 of the *Telecommunications Act* and in the Canadian Telecommunications Carrier Ownership and Control Regulations. Further, all applicants must comply with the eligibility requirements contained in Section 5 of the General Radio Regulations Part I.

6.3 Service Areas

Industry Canada proposes to issue spectrum licences for non-paired and paired blocks of spectrum for a given service area. Assignments will not be subject to site-by-site authorization.

As a first step, Industry Canada proposes to license service providers to offer service over large areas such as the 66 geographic areas identified as the LMCS service areas. These areas are those defined in the *Local Multipoint Communications Systems (LMCS) in the 28 GHz range: Policy, Authorization Procedures and Evaluation Criteria* document. A list of the areas can be found in Annex B and graphic representations can be found in Annex C.

The Department recognizes that licensees may see advantages to being licensed for service areas that are different from the LMCS geographic areas. Once the issues outlined in Section 7, technical considerations, are addressed the Department will be in a position to examine the possibility of having users play a greater role in defining service areas for which they wish to be licensed. The Department is interested in receiving comments as to the most appropriate definition of service areas. Also comments are invited on the best approach of incorporating suggestions for service area definition in the area licensing concept.

6.4 Licence Fees

Industry Canada is of the view that licence fees should reflect the economic value of the radio frequency spectrum being used. However, in the absence of a market based mechanism by which this economic value can be revealed, the Department recognizes that such determinations are difficult.

Industry Canada proposes to apply a fee proportional to the geographic area being licensed. An annual fee of 20$ per square kilometer per paired block would be applied to each of the 8 pairs of frequency blocks in the 23 GHz band and to each of the 14 pairs of frequency blocks in the 38 GHz band, and an annual fee of 10$ per square kilometer per block would be applied to the 4 single blocks in the 38 GHz band. This fee was derived from the LMCS fee of $.50 per household per 500 MHz frequency

block, as the total fee for the 66 service areas, divided by the total area served, and pro-rated for 50 MHz blocks. A list of the fees associated to each of the 66 proposed geographic areas is given in Annex B.

The Department seeks comments on the appropriateness of applying a fee based on the area served, especially with respect to the question of whether the Department should prescribe the geographic areas to be authorized. If a fee based on the area served is not appropriate, the Department seeks comments on the methodology that should be used to set fees for each of pre-defined and user defined service areas.

Future competitive bidding processes for licences will generate market data which the Department may use to calibrate fees for licences assigned previously on a first-come first-served basis. As an example, in situations where a licence assigned by auction is practically identical to an existing licence, the licence fee for the latter may be adjusted to match the auction determined fee that will be paid for the former.

6.5 Provisional Licensing Procedure

The Department wishes to complete its consultation on the issues discussed in this document before it releases its area licensing procedure for the 23 GHz and 38 GHz bands. The Department also realizes that some parties may be ready to start providing service before the end of the consultation period. Consequently the Department is prepared to issue radio authorizations in the interim. Interested parties who meet both the policy requirements as described herein and the eligibility requirements as defined in section 6.2 above may apply for an authorization to use frequency block(s) in the 23 GHz and 38 GHz bands. A block, or block pair, will be assigned once in a geographic area and applicants will be eligible for one block, or block pair, during the provisional licensing period. Applicants are not required to provide site specific information with their application, and there will be no fee attached to these authorizations. Once the area licensing procedure comes into effect every effort will be made by the Department to accommodate holders of radio authorizations as well as maintain the block(s) they have been assigned.

These radio authorizations will only be valid until such a time as the final area licensing procedure is released and comes into effect.

6.6 Conditions of Licensing

When installing radio stations, applicants must comply with the procedures for non-site specific stations as outlined in Client Procedures Circular (CPC) 2-0-03 - Environmental Process, Radio frequency Fields and Land-use Consultation. Radio apparatus will need to conform with the appropriate Industry Canada regulations and technical standards.

6.7 Spectrum Availability

At such time as the assignment of single blocks or paired blocks reaches a level of 75% of the spectrum available for authorization in a geographic area, (with the current allocation, 6 of the 8 paired frequency blocks available in the 23 GHz band, 10 of the 14 paired blocks in the 38 GHz band, or 3 or the 4 single blocks in the 38 GHz band) the Department will cease licensing on a first come, first served basis.

At that time, the Department will decide whether or not to undertake a process the objective of which would be to make additional spectrum available. Should additional spectrum ultimately be made available, first come first served licensing would resume. On the other hand should additional spectrum not be made available the Department may initiate a competitive bidding process for the remaining frequency blocks. The first stage of this process would consist of a request for expressions of interest for the remaining blocks. If the results of the request for expressions of interest demonstrate that the number of remaining blocks is sufficient to accommodate the expressed demand, the Department will continue to issue licences on a first come, first served basis. If, on the other hand, the results show that the spectrum availability does not meet the demand, the Department will proceed with a competitive bidding process for the remaining blocks in the service area defined.

6.8 Public Comments

Interested parties are invited to comment on a number of issues related to area licensing in the 23 GHz and 38 GHz bands, as described in section 6 of this document. Interested parties should submit their comments on or before **October 22, 1996** to the office of:

Director General
Radiocommunication and Broadcasting Regulatory Branch
Industry Canada
Journal Tower North
300 Slater Street
Ottawa, Ontario
K1A 0C8

7. Technical Considerations

Channel blocks will be assigned where there is a requirement for multiple service points or transmission paths within a geographic area, as per the spectrum policy provisions outlined in Sections 4 and 5. Assigned frequency channel blocks may be subdivided and used anywhere within the authorized service area, subject to the rules which will be developed in consultation with industry, in order to reduce the possibility of co-channel and adjacent channel interference.

7.1 Co-existence With Other Systems

There are two aspects to the potential for interference between systems:

(1) power levels into adjacent areas (co-channel)
(2) power levels into adjacent channels (same area)

Operators within the same general area are encouraged to enter into mutually beneficial arrangements to foster efficient spectrum use near their common boundaries. One of the attractive aspects of the block/area assignment is the freedom to use the given spectrum in a particular area with the minimum number of restrictions. Operators will be expected to take full advantage of interference mitigation techniques such as antenna discrimination, polarization, frequency offset, shielding, site selection, power control, etc. to facilitate co-existence with systems of other service providers.

To minimize the occurrence of adjacent channel interference an emission mask that is fixed at the channel edge i.e. independent of frequency tolerance, would be the preferred solution.

These aspects, as well as minimum bit efficiency, antenna standards etc. will be developed in consultation with the Radio Advisory Board of Canada subsequent to the release of this policy. Further, type approval of equipment will be used to facilitate the application of the block/area licensing concept, and the conditions for such should also be considered at the same time.

8. Implementation

It is suggested that applicants contact the nearest office of Industry Canada regarding radio licensing in the bands covered in this policy document. General inquiries about the policy provisions may be addressed to the Spectrum and Radio Services Directorate, Telecommunication Policy Branch, 300 Slater St., Ottawa, Ontario, K1A 0C8 (Phone: 613-998-4470/3974) (Fax: 613-952-0567)

Issued under the authority
of the Radiocommunication Act

Larry Shaw
Acting Director General
Telecommunications Policy Branch

Annex A

Transmission Capacity (SP 1-20 GHz)

RF Channel Capacity	Traffic Load (Mbit/s)[3]	
Low Capacity (LC) [1][2]	≥ 1.544	≤ 24.704
Medium Capacity (MC)	> 24.704	≤ 51.840
High Capacity (HC)	> 51.840	

Notes: (1) Smaller system capacities are also permitted in LC bands on a case-by-case basis.

(2) Capacities of less than 1.544 Mbit/s are not permitted in channels identified for MC or HC, unless specifically identified in the spectrum policy for the band.

(3) System capacities do not include radio system overhead bits.

Digital Signal (DS) levels and their relation in the digital transmission hierarchy are shown in the following table:

DS-0	64kbit/s	1 voice ch. + signalling	
DS-1	1.544 Mbit/s	1 T1	24 DS-0
DS-2	6.312 Mbit/s	1 T2	96 DS-0
DS-3	44.736 Mbit/s	1 T3	672 DS-0
STS-1	51.84 Mbit/s	1 OC-1	672 DS-0
STM-1	155.52 Mbit/s	OC-32	2,016 DS-0
16 STM-1	2.48832 Gbit/s	OC-48	32,256 DS-0
32 STM-1	4.97664 Gbit/s	OC-96	64,512 DS-0

Notes: SONET is the North American technology used for STM-1

T1	24 circuits
T2	96 circuits
T3	672 circuits
OC-1	1 T3
OC-3	3 T3

Annex B

Proposed Service Areas and Associated Licence Fees

Service Area	Fee ($) per paired block
Barrie	4195
Belleville	2138
Brandon	744
Brantford	1717
Brockville	4285
Calgary	11 669
Charlottetown	1421
Chatham	2209
Chicoutimi-Jonquière-Alma	17 775
Cobourg	3013
Cornwall	1486
Courtenay	9277
Drummondville	2860
Edmonton	59 882
Fort McMurray	1327
Fredericton	9622
Granby	3516
Grande Prairie	3690
Guelph/Kitchener	11 675
Halifax	17 281
Joliette	1478
Kamloops	10 215
Kelowna	17 633
Kingston	3661
Lethbridge	3859
London/Woodstock/St Thomas	10 400
Medicine Hat	2090
Moncton	2895
Montréal	58 756
Moose Jaw	920
Nanaimo	25 802
Niagara/St Catharines/Welland	5892
North Bay	2071
Orillia	1882
Ottawa/Hull	40 788
Pembroke	5564
Penticton	1422
Peterborough	3441

Service Area	Fee ($) per paired block
Prince George	5577
Québec	17 741
Red Deer	1241
Regina	4521
Rimouski	2720
Rouyn-Noranda	1439
Saint John	7132
Sarnia	3395
Saskatoon	4366
Sault Ste Marie	6259
Sherbrooke	10 146
Sidney	12 998
Sorel	2047
St-Hyacinthe	763
St. John's	6126
Stratford	1128
Sudbury	15 129
Thunder Bay	8064
Timmins	20 118
Toronto	80 279
Trois-Rivières	9805
Val-D'Or	8975
Vancouver	52 900
Victoria	12 440
Victoriaville	1260
Windsor/Leamington	12 441
Winnipeg	12 737

Annex C

Geographic representation of proposed service areas

(The maps contained in Annex C are not available on the Internet. Please request a printed copy of this document for this information.)