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DGSO-001-18
November 2018

Spectrum Management and Telecommunications

Consultation on Licence Fees for Fixed Point-to-Point Radio Systems

Note (effective January 10, 2019):
The text in paragraph 58 has been updated as follows:

- Reply comments will be accepted no later than January 25, 2019.

Aussi disponible en français

Canada

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Contents

1. Intent

1. The radiocommunication industry has evolved dramatically over the last 20 years and will continue to transform with 5th generation (5G) technologies. These technologies are expected to support innovative and data intensive applications within most industries while fostering smart city development.

2. Through the release of this paper, Innovation, Science and Economic Development Canada (ISED) is initiating a consultation on modernizing the radio licence fee model for fixed point-to-point systems and their associated fees. These systems support data traffic carried by current networks and future 5G networks which will demand even more capacity. ISED seeks comments on modernizing the fee model with a view to increasing spectrum efficiencies, utilization and flexibility while considering an evolving radiocommunication industry, where consumer demand for extended coverage, faster broadband data rates and connectivity anytime and everywhere continues to grow significantly.

2. Scope

3. This consultation applies to radio licence fees for fixed stations in the fixed service, specifically point-to-point systems. Examples of point-to-point systems include backhaul communications (defined as transport of aggregate communication signals from base stations to the core network), studio-to-transmitter links, and point-to-multipoint systems that use antennas that are directional in nature and not intended to serve an area. ISED is not proposing to change the fees for all radio licences as noted in the paragraph below.

4. Radio licence fees related to systems operating in the land mobile, aeronautical, amateur, maritime, public information and radiodetermination services, transportables and their associated links in any service, as well as licences related to space services (i.e. satellites or earth stations) are outside the scope of this consultation. Transportables are defined as stations that are authorized to operate in an area and are able to transmit or receive only when stationary. While some are in the land mobile service, others may be designated as fixed stations in the fixed service. Regardless, they are not in scope for this consultation. Until further review, these fees will continue to be calculated in accordance with the appropriate fee schedules in the *Radiocommunication Regulations*.

3. Mandate

5. Under the *Department of Industry Act*, the Minister of Innovation, Science and Economic Development may fix fees regarding the use of radio apparatus and spectrum in Canada, including new licence fees. Under the *Radiocommunication Act*, the Governor-in-Council may make regulations prescribing fees for radio authorizations.

6. The Minister is responsible for developing goals and national policies for spectrum resource use and for ensuring effective management of the radio frequency spectrum.

4. Policy objectives

7. Spectrum is a scarce and valuable natural resource. ISED encourages its efficient and optimal use through policy and standards to ensure its continued availability. Radio licence fees are one mechanism designed to promote both the effective use of spectrum and to earn a fair return for the Canadian public for the privilege of access to this public resource.

8. Through Canada's Innovation and Skills Plan and its focus on skills, research, technology and commercialization, program simplification, and investment and scale, the Government of Canada is committed to promoting innovation-led growth across all sectors of the Canadian economy. Spectrum is widely used by all economic sectors and is integral to Canada's telecommunications infrastructure.

9. As set out in the *Spectrum Policy Framework for Canada* (SPFC) and its enabling guidelines, ISED aims to maximize the economic and social benefit that Canadians derive from the use of the radio frequency spectrum in light of the challenges of a rapidly changing technological environment. ISED has committed to ensuring that Canada has a world-class telecommunications infrastructure and that Canadian consumers, businesses and public institutions continue to benefit from advanced wireless telecommunications services and applications.

5. Marketplace and technology developments

10. Consumer demand for extended coverage, faster broadband data rates, and connectivity anytime and everywhere are driving the significant growth of data traffic volumes. As noted in the *Spectrum Outlook 2018-2020*, the Cisco Visual Networking Index (a collection of reports and forecasts, updated annually, regarding global fixed/mobile traffic and Internet trends) is forecasting that globally, average per capita monthly traffic will increase to 35.5 GB by 2021, up from 12.9 GB per capita in 2016. According to the *Ericsson Mobility Report* (June 2018), North America has the highest monthly usage of mobile data traffic per smartphone, at 7.2 GB in 2017, and this is expected to reach 49 GB by the end of 2023.

11. The number of wireless backhaul systems as well as the amount of traffic that each carries (capacity) has steadily increased, driven by both commercial and consumer demand. Moreover, the demand for backhaul capacity is expected to grow to support the large data demands anticipated for 5G networks. Current Long Term Evolution (LTE) systems require 90 Mbps of backhaul capacity for a typical site, with some requiring up to 1 Gbps. For 5G networks in 2021, the capacity requirements are expected to be 300 Mbps for a typical site and, for some sites, between 3 and 10 Gbps. By 2025 the anticipated requirements are 600 Mbps and 10-20 Gbps, respectively, according to the *Ericsson Microwave Industry Outlook* (December 2017).

12. To meet increasing demands, wireless service providers are actively upgrading their networks with state-of-the-art technologies. New and innovative technologies have been and continue to be developed so that spectrum is used more efficiently and more data can be transmitted using less spectrum (i.e. smaller bandwidths).

13. Given the current increases in traffic and demand on wireless backhaul networks, the expected capacity requirements and deployment scenarios of 5G, as well as continued demand for broadband and other services, ISED is carefully considering all options for encouraging the efficient use of spectrum as well as accurately reflecting its value. One such option is licence fees.

14. ISED recognizes that because the radiocommunication sector has grown and introduced greater innovation, fixed point-to-point radio licence fees need to be modernized accordingly.

6. Licence fees

15. In considering options for fixed point-to-point radio licence fees, ISED reviewed fee models in other countries and in Canada. Further, ISED considered recent feedback from stakeholders in response to the *Consultation on the Spectrum Outlook 2018-2020*, which indicates that fees in Canada for radio licences for backhaul discourage innovation and investment in new technology and hinder the effective use of spectrum.

6.1 International comparison

16. ISED examined the fee-setting methodologies of other countries that have similar spectrum management policies as Canada, such as the United Kingdom and Australia, as part of its review. While many factors used to calculate fees in other countries are comparable, it is difficult to draw definitive conclusions on the international value of spectrum given the differences in each country's spectrum environment and market. Differences include demographics, geography, timing of fee initiatives, and relative competitiveness—all of which have a significant impact on the value of spectrum.

17. Most regulators seek to reflect the utility of spectrum in licence fees, but the approaches for accomplishing this vary considerably and are often affected by other historical and institutional factors. The United Kingdom and Australia, as well as other countries, set higher radio licence fees for frequency bands below 1 GHz, given their technical characteristics. In the area of spectrum management, ISED compares relatively closely with the regulators in the United Kingdom and Australia, where fees are used as a policy tool to promote efficient use of this resource and are directly linked to spectrum consumption.

18. In the United Kingdom, radio licence fees are designed to reflect spectrum consumption and its overall availability, as well as take into account technical and operational factors. In addition to the amount of spectrum used (bandwidth), the fee also reflects the popularity of the frequency band as well as the system's availability, distance of the link

and the use of spectral efficient technologies (additional information regarding the U.K.'s fixed link licence fees can be found on the Ofcom website).

19. Australia's pricing framework for fixed systems combines consumption-based fees (to provide incentives for efficient spectrum usage) with additional charges designed to recover administrative costs. In addition to the amount of spectrum consumed, the fee algorithm also takes into account the density of services and demand for spectrum at different frequencies and corresponding geographic areas. The fee is also updated each year by the consumer price index (additional information regarding Australia's apparatus licence fee schedule can be found on the ACMA website).

6.2 Canada's radio licence fees

20. In Canada, radio licence fees are considered charges for a limited privilege, and permit access to and the use of, a publicly-controlled natural resource. They are designed to further spectrum management objectives such as those outlined in this consultation.

21. Current fees for licences under consideration are set out in the *Radiocommunication Regulations*. Radio licence fees are capacity- and apparatus-based, with the telephone voice channel[1] forming the basic unit, regardless of whether the system is digital or analog. Schedule III, Part II of the *Radiocommunication Regulations* is used to calculate radio licence fees for these types of systems. There is a separate fee for each transmit and receive frequency. The current capacity-based fee regime, based on the number of equivalent telephone channels, has the effect of generating higher fees for systems which use spectrum efficiently.

22. ISED has implemented measures for bands, including those used by point-to-point systems, to promote efficiency and reduce spectrum congestion through technical requirements, such as specifying the use of narrower channels, reduced power levels and directional antennas in congested environments. Such technical measures, combined with an effective licence fee model, form a balanced approach to encouraging efficient use of spectrum.

7. Radio licence fee guiding principles

23. Recognizing the evolving wireless radiocommunication industry and taking into account stakeholder feedback, ISED is seeking to improve the fixed point-to-point radio fee model to accommodate new developments in technology, service and architecture, such that the fee model:

- encourages innovation and rewards spectral efficiency

[1] For the purpose of calculating the radio licence fees payable for a radio licence authorizing operation on certain frequencies for radio apparatus installed in a fixed station or space station referred to in section 61 or 65 or 73 of the *Radiocommunication Regulations*, paragraph 58(*c*) applies: one digitally modulated channel is equivalent to the number of telephone channels calculated by dividing the modulation bit rate by 64 kilobits per second.

- reflects the relative utility of different spectrum bands (utility in the context of this consultation refers to the frequency band's usefulness and overall amount of available spectrum, that is abundance or scarcity)
- is clear and predictable but can be adjusted to changing markets and technological advances
- reflects the requirements of the *Service Fees Act* including the implementation of a periodic fee adjustment

8. Proposed consumption-based point-to-point fee model

24. To promote more efficient use of the radio spectrum while continuing to earn Canadians a fair return for the amount of spectrum assigned or consumed by licensees, ISED proposes to establish a consumption-based fee model for fixed point-to-point systems (as described in section 2). The proposed model takes into account the amount of spectrum used and technical factors that influence the spectrum's value.

Proposed annual radio licence fee = consumption factor × base rate ($/MHz)

whereby:

- the **consumption factor** is based on the amount spectrum assigned (detailed explanation to follow)
- the **base rate** is dependent on the frequency band

8.1 Guiding principle 1: Rewards spectral efficiency and encourages innovation

25. Modern radio equipment can transmit more capacity using the same or even less spectrum than previously required. As radio technologies evolve, licence fees should support more innovative solutions. In the proposed model, the radio licence fee would depend on the amount of spectrum assigned to or consumed by the licensee. The more (or less) spectrum a licensee uses for their system, the higher (or lower) their fees, within a given frequency range. A consumption-based fee model would provide incentives to licensees to be more spectrally efficient, encourage them to make use of and invest in the latest radio technology, and give them control over their costs.

Consumption factor

26. ISED proposes that the channel bandwidth, as established by ISED in the relevant Standard Radio System Plans (SRSPs), be used as a proxy for the consumption factor in the fee calculation formula. This corresponds directly to the amount of spectrum assigned to the licensee (i.e. based on the bandwidth on the licence).

27. Specifically, for frequency bands with associated SRSPs, the assigned spectrum would equate to the narrowest channel width (as per the SRSP) that is greater than or equal to the system's occupied bandwidth. For frequency bands without an associated SRSP, or when the occupied bandwidth is greater than the largest channel in the associated SRSP, the spectrum assigned would be the occupied bandwidth.

28. With this proposal, there is now an incentive for licensees to maximize the efficiency of the spectrum used. With the proposed fee model, the fees would be identical whether 10 Mbps or 300 Mbps is transmitted using the same channel width. Since the proposed fee would be based on the consumption of spectrum, the licence fee for a 20 MHz link that transmits the same amount of data as a 40 MHz link (using the same frequency) would be half the amount.

8.2 Guiding principle 2: Reflects the relative utility of different spectrum bands

29. Different frequency ranges exhibit different properties making some bands inherently more valuable than others depending on the particular point-to-point system and type of application. For instance, mid-range frequency bands are heavily used for backhaul, to transmit telephone, data and Internet traffic between cities, given these bands' propagation characteristics.

30. ISED proposes that the fees reflect a frequency band's utility. This would provide not only an incentive to use spectrum efficiently (i.e. using higher frequency bands for shorter distances) but also to innovate, for example, by developing new applications and technologies in low-cost, underutilized bands.

31. The use of a particular frequency range depends on a variety of technical requirements (e.g. long-, medium- or short-haul), design characteristics, operational practicalities, propagation characteristics and the overall amount of available spectrum, making some frequency ranges more suitable and attractive than others.

32. The proposed frequency ranges are based on similar propagation characteristics of the bands, as well as categories of use and types of applications (e.g. backhaul systems and studio-to-transmitter links).

33. ISED proposes that base rates, expressed as $/MHz, be established for a series of frequency ranges covering the full radio spectrum. This fee schedule would ensure fees are in place, regardless of when new frequency bands are made available for specific services.

34. ISED also proposes that the base rates reflect their relative value and utility to each other, taking into account propagation characteristics, the amount of available spectrum within the bands, channel sizes available, and usage. Table 1 outlines the proposed fee schedule of frequency ranges and base rates.

Table 1: Proposed fee schedule of frequency ranges and base rates

Frequency range	Base rate ($/MHz)
≤ 890 MHz	2750
> 890 and ≤ 960 MHz	138
> 960 and ≤ 4200 MHz	45
> 4.2 and ≤ 10.55 GHz	34
> 10.55 and ≤ 19.7 GHz (reference band)	24
> 19.7 and ≤ 60 GHz	16
> 60 GHz	1

35. The mid-range frequency bands (10.55-19.7 GHz) are the most frequently assigned in Canada for point-to-point systems. These bands are predominantly used to provide a range of high-, medium- and low-capacity applications. As such, ISED has used it as its reference band. ISED is proposing a base rate of $24/MHz for the mid-range frequency bands, which aligns with the average annual fee currently paid by licensees on a per MHz basis.

36. Lower base rates are proposed for higher frequency ranges, since transmitted signals do not travel as far and therefore the impact on neighbouring areas (i.e. congestion) is reduced, which increases the spectrum that can be reused by other licensees. In the same vein, licensees require additional infrastructure (i.e. more investment) to cover larger distances when using higher frequency bands. Finally, the abundance of available spectrum in the higher frequency bands further reduces their relative value.

37. Applications using spectrum below 890 MHz typically have smaller channels widths and are measured in kilohertz rather than megahertz. The proposed base rate for this frequency range is set with consideration to the relative channel size and the limited amount of spectrum below 1 GHz (compared with 10 GHz of spectrum available in the 70 GHz band).

8.3 Guiding principle 3: Clear and predictable

38. ISED is of the view that licensees will benefit from a fee model that is easily understood and applied. While other fixed point-to-point fee models may take into consideration additional factors such as path length (i.e. distance of a link), these factors can be accounted for in other values such as the base rate for each frequency range (e.g. reliability of the path length decreases as frequencies increase and are therefore valued accordingly).

39. In keeping the model straight-forward, licensees will be able to quickly determine the fees associated with their network plans and make any necessary adjustments to control their costs. Furthermore, a fee model which is based on the utility of the frequency range and the amount of spectrum used enables service providers to make investment decisions.

40. ISED's proposed fee schedule (table 1) is designed to be sufficiently flexible to accommodate technological advances and usage trends. ISED can account for these technological changes by adjusting base rates when required, upon consultation with stakeholders. The application of the proposed fee schedule for different types of configurations, technology and systems is discussed in annexes A and B.

8.4 Guiding principle 4: Periodic fee adjustment

41. The *Service Fees Act* (SFA) requires that all federal fees be periodically adjusted. If a fee escalator is not in place, departments are to apply the consumer price index (CPI) annually. ISED would consider establishing a fee escalator using a fixed rate of increase instead of a variable amount to provide fee predictability.

Q1: ISED invites comments on the proposed consumption-based fee model for the radio licence fees under consideration. Q2: ISED invites proposals for a fee escalator that takes into account fee predictability for the radio licence fees under consideration.

8.5 Minimum fees

42. The minimum fee that licensees currently pay is $68 for a single frequency link (typically uni-directional). ISED proposes that the minimum annual fee be increased to $70. ISED proposes a simple, standard and consistent fee to align with the guiding principles noted above.

8.6 Short-duration licence fees

43. A short-duration licence is defined as an authorization for a period of up to 30 days. ISED proposes that the applicable fee be 1/12 of the total annual fee rather than using a set monthly fee.

8.7 Prorated fees

44. ISED does not propose to change the timing around the issuance and renewal of licences. ISED's fiscal year begins April 1st and concludes March 31st. Annual licence renewal fees are payable each year by March 31st. Once paid, licences are valid until March 31st of the following year.

45. Licences will continue to be issued by ISED at any point during the year. However, ISED proposes that the annual fee be prorated based on the month in which the licence is issued. Specifically, the prorated fee would be 1/12 of the total annual licence fee, for each calendar month until March 31st of the current fiscal year, rather than a set monthly fee used in the calculation.

Q3: ISED invites comments on the proposals for minimum fees, short-duration licence fees and prorated fees.

9. Impact of proposed fee model

46. With the continued increases in traffic and capacity carried over networks in response to consumer demands and within the context of 5G, the proposed fee model would provide licensees with greater control over their licensing costs. Further, licensees with systems operating on higher frequencies where there is less congestion and an abundance of spectrum available would see a great reduction in licence fees.

47. For example, the current fee for a two-frequency, bi-directional link transmitting 3 Gbps in the 70 GHz band is approximately $40,000 each year. The annual licence fee for the same system, transmitting over a 750 MHz channel, using the proposed model is roughly $1,500 (a 96% fee decrease). A two-frequency, bi-directional link transmitting 300 Mbps currently pays an annual licence fee of approximately $4,000; under the proposed model, the fee would be reduced by 87% to $500 (using a 250 MHz channel). For more examples of fee calculations, see annex B.

48. Licensees deploying spectrally efficient equipment would see a reduction in their licence fees. These cost savings would enable licensees to continue investing in and installing higher capacity backhaul equipment to provide new services and technologies (e.g. 5G) to Canadians, without incurring corresponding increases in licence fees as is the case with the current fee regime. Moreover, all licensees would be provided the opportunity to reduce their fees and/or improve their service by using spectrally efficient equipment or by transmitting more data with the same equipment (resulting in a reduction of their unit data costs).

49. In some instances, licensees would see an increase in fees. Because the proposed fees increase with spectrum consumption, point-to-point links using less efficient wide-band equipment would pay higher fees than those using more efficient narrow-band equipment for the same capacity. However, an important feature of the proposed consumption-based radio licence fee model is that licensees would benefit from the ability to control licence costs. More throughput/capacity can be added to existing systems without any change in fees, which is not the case under the current fee regime.

50. Based on the current fees for fixed point-to-point systems, the implementation of the proposed fee model would see the overall fees paid by licensees for their existing deployments decrease by approximately $11M, from $42M to $31M annually.

10. Implementation

51. Recognizing that existing and potential licensees may require time to adjust to the new fee approach, ISED proposes that the model be implemented for fees payable starting April 1, 2020. This will provide an opportunity for licensees to review and optimize their systems and associated licences, taking full advantage of new features that allow them to control costs.

52. As per the recently enacted *Service Fees Act*, many federal fees, including radio licence fees, are subject to mandatory annual adjustments based on the All-items Consumer Price

Index for the previous year, as published by Statistics Canada. These adjustments will occur until an alternative fee escalator is established.

11. Submitting comments

53. Respondents are requested to provide their comments in electronic format (Microsoft Word or Adobe PDF) by email.

54. Printed submissions can be mailed to:

Senior Director, Spectrum Management Operations Branch
Innovation, Science and Economic Development Canada
235 Queen Street (6th Floor, East Tower)
Ottawa, Ontario K1A 0H5

55. All submissions should cite the *Canada Gazette*, Part I, the publication date, the title and the notice reference number (DGSO-001-18). Parties should submit their comments no later than January 4, 2019, to ensure consideration.

56. Respondents are asked to specify question numbers for ease of reference and provide supporting rationale for their comments. As all comments and reply comments will be posted on the departmental website, respondents are asked not to provide confidential or private information in their submissions.

57. Soon after the close of the comment period, all comments received will be posted on the Spectrum Management and Telecommunications website.

58. ISED will also provide interested parties with the opportunity to reply to comments from other parties. Reply comments will be accepted no later than January 25, 2019. Following the initial comment period, ISED may, at its discretion, request additional information if needed to clarify significant positions or new proposals. In such a case, the reply comment deadline may be extended. Reply comments will also be posted on the Spectrum Management and Telecommunications website.

12. Next steps

59. After reviewing any input received, the Minister of Innovation, Science and Economic Development will make a final policy decision. Implementation of fee changes will require amendments to the *Radiocommunication Regulations*. Any such changes will be subject to further consultation through a *Canada Gazette* (Part I) notice.

13. Obtaining copies

60. All spectrum-related documents referred to in this paper are available on ISED's Spectrum Management and Telecommunications website.

Annex A: Proposed application of radio licence fees for various point-to-point configurations

Below are examples of a number of different radio configurations and how they may be treated under the proposed point-to-point (PTP) fee model.

Single-frequency and two-frequency links (e.g. uni- and bi-directional radio links)

A single-frequency link would be charged for the spectrum consumed over that single frequency. A two-frequency link would be charged for the spectrum consumed over both frequencies.

Point-to-multipoint systems

The total fee for a fixed point-to-multipoint (PTMP) system would be the sum of the PTP fees for each of the individual links within the system.

Standby and diversity links

Provided no additional spectrum is used, no additional fees will be incurred when the following links or kinds of equipment are deployed by a licensee along the route of a licensed link:

- space diversity
- hot standby
- co-channel dual polarization (CCDP, on the same channel but orthogonal polarization)
- active and passive repeaters

For the purposes of route and frequency diversity, where independent links are deployed across different paths or additional frequencies are used along the same route, the spectrum used by each link would be charged fees accordingly.

Adaptive modulation

Adaptive modulation allows systems to maximize their throughputs by varying the modulation during adverse propagation conditions (e.g. rain fade). Provided no additional radio spectrum is consumed, no additional fees will be applied when adaptive modulation is employed.

Annex B: Calculating PTP radio licence fees

This annex describes how to calculate PTP radio licence fees using the proposed fee models. Included are three examples of common systems, their fee calculations and explanations on how fees are affected by spectrum consumption. For convenience, table 1 from the section 8 is provided below.

Table B1: Proposed fee schedule of frequency ranges and base rates

Frequency range	Base rate ($/MHz)
≤ 890 MHz	2750
> 890 and ≤ 960 MHz	138
> 960 and ≤ 4200 MHz	45
> 4.2 and ≤ 10.55 GHz	34
> 10.55 and ≤ 19.7 GHz	24
> 19.7 and ≤ 60 GHz	16
> 60 GHz	1

Concepts used in calculating the annual radio licence fee for PTP systems

1. The range of your assigned frequency: Find the range of your frequency assignment in table B1 to determine the base rate you will use in the fee calculation.

2. The bandwidth of each frequency assignment: Consult the SRSP that applies to the frequency band for the standard channel widths—in general, using a narrower standard channel width would result in lower fees. Where your bandwidth is within a standard channel width, that channel width is used. Where your bandwidth exceeds the maximum standard channel width, your actual (occupied) bandwidth will be used.

3. Radio licence fees apply to each frequency, so the fees for a single frequency link would be half that of a two-frequency link, everything else being equal.

Example 1: 5G short-range data link

Base rates for high frequency ranges have been set lower due to larger channel widths. Current fees for these bands will vary greatly depending on data transmission rates. This example is based on 3 Gbps, which is a rate typical of 5G technology, using 750 MHz bandwidth. Using the proposed model, the fee is over 26 times lower than what a licensee would pay now. The example also demonstrates the complexity of current fee calculations which require the conversion of Mbps to equivalent voice channels. The fee table used for current licence fee calculations comes from the *Radiocommunication Regulations* Schedule III Part II.

Points to consider:

Fee model:	Consumption factor × base rate = licence fee
PTP base rate:	$1/MHz for frequencies over 60 GHz
Channel width (see SRSP-371.0):	750 MHz
Number of frequencies:	2

Fee calculation:

Proposed yearly radio licence fee for a bi-directional link in the 70 GHz band using a 750 MHz channel:

Proposed fee: 750 MHz × 2 frequencies × $1/MHz = **$1,500**

The **current** yearly radio licence fee for this system would be **$39,664**.

Detailed fee calculation for current licence fee:

3 Gbps, using 750 MHz bandwidth:

Converting Mbps to Equivalent Voice Channels (EVC):
3,000 Mbps/0.064 = 46,875 EVC

Fee for 1,200 EVC = $277

Using rate of $63 per 300 telephone channels or portion thereof in excess of 1,200 EVC:
46,875-1,200=45,675
45,675/300= approx. 153 EVC
153 x $63 = $9,639

Current licence fee for two sites, using a receiver and transmitter at each site (i.e. four apparatus):
= ($277+$9,639) x 4 = **$39,664**

Example 2: 5G mid-range data link

A backhaul, two-frequency, PTP, fixed link is assigned a 60 MHz channel in the 6 GHz band and carries 1 Gbps of data.

Points to consider:

Fee model:	Consumption factor × base rate = licence fee
PTP base rate:	$34/MHz for frequencies in the 4.2 to10.55 GHz range
Channel width (see SRSP-305.9 and SRSP-306.4):	60 MHz
Number of frequencies:	2

Fee calculation:

Proposed fee: 60 MHz × 2 frequencies × $34/MHz = **$4,080**

The **current** yearly radio licence fee for this link is **$13,456.**

Notes on the proposed fees:

1. With this consumption model, if the licensee increases the data to **2 Gbps**, without increasing the channel width, there would be no change to the licence fee. Under the current fee regime, the licence fee would approximately double.

   Proposed fee: 60 MHz × 2 × $34/MHz = **$4,080**

2. If the licensee uses more efficient radio equipment, 30 MHz compared to 60 MHz channel width, there would be a 50% reduction in the licence fee:

   Proposed fee: 30 MHz × 2 frequencies × $34/MHz = **$2,040**

Example 3: Studio-to-transmitter link

A studio-to-transmitter link (STL) for a radio broadcasting station is a point-to-point fixed one-frequency link which is typically assessed as 3 equivalent voice channels. For this example, it is assigned a 375 kHz channel in the 953-960 MHz band.

Points to consider:

Fee model:	Consumption factor × base rate = licence fee
PTP base rate:	$138/MHz for frequencies between 953 MHz and 960 MHz
Channel width (see SRSP-300.953):	0.375 MHz
Number of frequencies:	1

Fee calculation:

Proposed fee: 0.375 MHz × 1 frequency × $138/MHz = **$51.75**

As the proposed fee is less than the minimum fee per frequency assignment, the **minimum fee of $70 would apply**.

The **current** yearly radio licence fee for this studio-to-transmitter link is **$68**