Industry Canada

Consultation on a Policy and Technical Framework for the 700 MHz Band and Aspects Related to Commercial Mobile Spectrum

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Executive Summary

1. There are two sections to this submission concerning the technical framework for the 700 MHz auction. The first section deals with precise questions put forth by Industry Canada's Consultation document; in particular questions involving spectrum set-asides, spectrum aggregation limits (caps), length of licenses, measures to prevent spectrum warehousing, and open access provisions. This submission argues in favour of spectrum caps and set-asides for the 700 MHz auction, and recommends that the length of license be set for ten year periods, as was the case in earlier spectrum auctions. We also argue that Industry Canada must take steps to ensure Canadians derive full benefit from the commercial use of the public spectrum by placing safeguards in the spectrum auction to ensure licensed frequencies are not "warehoused" (purchased to keep out of hands of competitors but not used). We are supportive of requiring the use of open platform standards for devices and applications, but note that the term 'open access', used in the Consultation document to describe such standards has multiple meanings and should be very precisely defined in this context.

2. The second part of our proposal is an innovative new national communication infrastructure that will require consideration before the amount of spectrum available for auction is determined. We propose a tier one public access wireless service to ensure Canadians have access to public services at all times across the country. This is not public broadband internet access, but a 'walled garden' that will include mobile access to all three levels of government services and other services deemed essential. We call this the Canada Broadband Portal (CBP).

3. The idea behind the Canada Broadband Portal is to ensure key public interest objectives of the Telecommunications Act are maintained, while recognizing the role played by the private sector in providing many of the digital consumer-based products Canadians want. The Canada Broadband Portal is a logical progression from historic national communications projects (the railway, telecom, the CBC, the Trans-Canada highway), and will provide public communication infrastructure to enable and support citizens' participation in the digital economy. Our purpose in this submission is to provide an overview of the rationale behind the Canada Broadband Portal concept, and offer a rough sketch of how this plan might actually be realized. This proposal is by no means a complete plan.

4. In response to section 10-1 of the consultation (auction timing): given the tight time frame for submissions on this auction, and the opportunity to learn from holding auctions in succession, we recommend conducting an auction for licences in the 700 MHz band first, followed by an auction for licences in the 2500 MHz band approximately one year later.

Part One – Response to Specific Consultation Questions

7.1: Possible Need to Promote Competition

5. As per the Governor in Council's 2006 directive,[1] Canadian telecommunications policy objectives are to be achieved by reliance upon market forces. In particular, the directive notes the importance of enabling competition from new technologies. There is a real need to promote further competition in the Canadian broadband market, and wireless providers can offer a viable alternative to the cable and telco duopoly that currently controls more than 94% of the Canadian residential broadband market.[2] Although wireless broadband cannot match the speeds or full functionality of wired broadband networks,[3] for many Canadians wireless broadband services will be able to meet many of their needs for broadband connectivity in the short to medium term. As such, it is essential to recognize wireless broadband services as a facilities-based competitor to existing DSL, fibre and cable broadband services, and to develop policy for the allocation of spectrum that recognizes wireless broadband as an essential component of Canada's overall broadband infrastructure.

6. Wireless broadband must not be considered just as part of the existing wireless services market. However, in response to point 7-1 (c) requesting comparison between the Canadian wireless broadband market and the market in other jurisdictions, data from the International Telecommunication Union show that Canada had 4.6 potential mobile broadband subscribers per 100 inhabitants in 2008 (most recent data available), as compared to 40.6 in Australia, 22.6 in Denmark, 78.2 in Japan, 71.6 in Korea, 33.9 in the UK and 26.3 in the United States.[4] More recent OECD data (June 2010) report on mobile broadband subscriptions (used with smart phones) separately from mobile data subscriptions (standalone USB 'dongles' and personal hotspots used to provide broadband access to a

laptop or desktop computer, offering a substitute for wired broadband)[5]. Canada has just 2.4 mobile data subscriptions per 100 inhabitants, as compared to 78.6 in Korea, 23.3 in Sweden and 21.2 in Australia. These data suggest that there is enormous opportunity for growth in the Canadian mobile broadband market, provided that consumers are offered affordable, quality mobile broadband services.

7.2: Specific Mechanisms Applicable to the 700 MHz and 2500 MHz Auctions

Set asides for new entrants and small carriers

7. Despite continued government proposals and general high-level rhetoric depicting Canada as a leader in high speed connectivity, weak competition in the Canadian broadband sector has resulted in a lack of innovation and precipitated Canada's gradual decline as a world leader in this area.[6] The current Canadian system has failed to provide lower commercial rates for broadband services. In particular, public uptake of wireless broadband has proven slow. The June 2010 OECD data place Canada 22nd on the list of countries for mobile wireless broadband subscriptions (this figure includes data plans for phones as well as standalone mobile broadband services).[7] Canada's adoption rate of 17.9% is far behind countries such as the United States (9th place at 44.4%) or Australia (8th place at 47.1%). Across OECD member countries, wireless broadband usage has seen substantial growth in recent years. As Middleton and Given observe: "These data suggest that wireless broadband services are popular with OECD consumers. However, as fixed broadband subscriptions tend to serve households (with one or more users) and wireless subscriptions serve individuals, it should be noted that the fixed broadband services are likely serving more individuals than wireless broadband networks are."[8] This wireless access is a key technology in Canada's digital future. Further competition must be encouraged and the structure of the 700 MHz spectrum

auction offers a rare occasion to give some direction to the industry without stifling growth with excessive regulation.

8. The policy direction for Canadian telecom is now designed to encourage market forces, instead of the regulated economy that has been the tradition in this sector. Simply stating as much will not allow market forces to be realized. In his 2010 book The Master Switch, American-based Canadian scholar Tim Wu observes:

> "In the first decade of the twenty-first century…if you wanted to start a competitive mobile phone service, to take on AT&T, Verizon, and the rest, the price of entry – for a spectrum license, towers and other necessities – was somewhere north of $10 billion…Thus, for most of the twentieth and twenty-first centuries the phone market has been effectively closed".[9]

9. The example used may be American, but the sentiment also applies to Canada. The supposed benefits of market forces (innovation, lower prices, and variety of service) will not be actualized without significant changes to the current industry structure.

10. It is our position that some spectrum set asides are required in this auction as they were in the 2008 Advanced Wireless Services (AWS) auction. The AWS auction was a first step in enabling further competition in the Canadian wireless marketplace. The mobile service providers established after the 2008 auction have only recently began to establish a subscription base, and their business has thus far been limited to low-end service plans. These new entrants (e.g. Mobilicity, Wind) face barriers to competition because of the nature of the AWS spectrum. This spectrum is not widely used internationally, meaning that there are limited devices (handsets) available for use, and customers wanting to switch from

an incumbent provider are unable to use their existing handset. In contrast, it is anticipated that the 700 MHz band will be widely used, and all providers will compete on an equal basis. A set-aside for new entrants and small carriers is therefore warranted for the auction of the 700 MHz band, to foster additional competition (including a wireless broadband alternative to the DSL/cable duopoly that currently provides broadband to more than 94% of Canadians) and provide consumers with better mobile services. The 2009 700 MHz auction in the US included no provisions favoring new bidders and was subsequently dominated by incumbents.[10] That cannot be allowed to happen in Canada. We support setting aside 20% of the available 700 MHz spectrum for an auction among new telecommunications service providers and to carriers with less than 5% of current market share.

Spectrum caps

11. A concern with encouraging new growth is that small carriers may promptly be purchased by larger established companies, along with their spectrum reserves. This was the case after the 2001 PCS auction (for example Rogers' purchase of Sprint Canada). For this reason some degree of spectrum cap for companies and their affiliates will be required to sustain competition after the auction is complete. Spectrum aggregation limits or "Spectrum caps" are a proven effective method of ensuring plurality. In their 2010 essay on the US 700 MHz auction, *The Greatest Auction in History*, Preston, McMillan, and Wilkie note that spectrum caps are "a simple means of ensuring adequate competition in the final product market".[11]

12. Establishing a precise formula for spectrum caps is difficult, but certain benchmarks should apply to ensure plurality in this sector. Given the high value of this limited public resource, especially given the length of the licenses with an expectation of renewal, we believe that both set asides and spectrum caps are required for this auction. There is precedent for this

policy: in 1995 Industry Canada introduced a spectrum cap of 40MHz for an initial auction of PCS frequencies, and in 1999 the spectrum cap was increased to 55 MHz prior to the auction of the remaining 40 MHz of PCS spectrum. A purchase of a smaller company by an incumbent should not be allowed if it meant there would be less than three distinct providers in a region of the country. As a template, we recommend that Industry Canada look to the CRTC's 2008 Diversity of Voices decision which imposed limits on the ownership of broadcasting licenses to ensure that one party does not control more than 45 per cent of the total television audience share as a result of a transaction.[12] The caps should require no one company or affiliates own more than 45% of licensed spectrum in a region.

13. The high level of capital required to participate in the spectrum auction, immediately creates a substantial barrier of entry for new mobile broadband services in the 700 MHz spectrum. Spectrum caps and set asides will do much to contribute to a more vibrant and innovative telecommunications marketplace.

Usage clause

14. Bell, Rogers and Telus – the largest wireless service providers in Canada – hold a combined total of 55% of the Advanced Wireless Spectrum; however, as of 2011 they have not launched any services related to that spectrum. It is not an efficient use of public resources when the three biggest carriers buy spectrum that they have no plans to use. First of all, it limits the opportunities for new entrants and smaller players by removing that spectrum from the marketplace. Secondly, it denies Canadians use of their radio frequencies for any other purpose, including technologies which are yet to exist but must be prepared for given the length of license agreement. It would place future development in the position of leasing

space from an owner that has no intention of using the frequency. Canada must move to restrict this wasteful warehousing of spectrum.

15. The UK regulator Ofcom has the power to revoke a license if the frequency remains unused. Similar powers must be given to Industry Canada and/or the CRTC. We propose a four year limit on a spectrum license holders rights, in which time the licence holders must demonstrate tangible efforts to make use of the spectrum. Innovation cannot flourish while valuable spectrum sits idle.

10 year licenses

16. In November of 2010, Industry Minister Tony Clement presented his Interim Report on the Digital Economy and Telecom Strategies and announced in a speech that the previous spectrum license term of ten years would now be expanded to 20 years.[13] No context was given for this sudden doubling of the license tenure. The ten year limit for spectrum license was legislated in the 2001 *Framework for Spectrum Auctions in Canada* (section 4.5) and remained part of the 2009 *Consultation on Revisions to the Framework for Spectrum Auctions in Canada* (section 5.1). There was no public consultation on the topic of license terms prior to Minister Clement's speech and no public rationale for doubling the length of the term. This announcement represents a significant shift in Canadian spectrum policy.

17. We appreciate the investment planning required by bidders but we believe a 20 year license term is unwarranted. In the rapidly changing environment of mobile communications, a 10 year period with option for renewal is the best option for Canada. There are likely to be technological changes that improve spectrum efficiency over the next decade, as well as new uses for radio frequencies. To allow 20 years would be too restrictive on how the spectrum

may grow and develop by placing this public resource under complete private control. We therefore recommend that lease terms remain limited to 10 years.

18. In summary, we feel that setting limits on ownership via set-asides for new entries and spectrum caps to ensure plurality are completely appropriate for the 700 MHz auction. Companies must be allowed adequate spectrum to offer a robust range of services to Canadians, but it is in the best interest of consumers and the overall vibrancy of the marketplace in this sector that policy be established that encourages competition. We reiterate that it is essential for Industry Canada to take further measures to promote competition in the provision of broadband services in Canada through the 700 Mhz auction.

9. Open Access

19. The term "open access" is frequently used in the context of broadband network development to refer to a network that is designed to allow multiple providers to offer services over a single physical infrastructure. For example, Harvard University's Berkman Center for Internet & Society's report on the development of international broadband markets describes open access policies as those that encompass "unbundling, bitstream access, collocation requirements, wholesaling, and/or functional separation."[14] Australia's National Broadband Network and Singapore's Next Generation Nationwide Broadband Network are built on these principles, as is the Alberta SuperNet.[15] The CRTC has also used the term in a similar way, for instance referring to "open access and unbundling" throughout its 1994 review of the regulatory framework.[16] Although the CRTC no longer uses "open access" in this way, it is suggested that the term "open access" is a problematic one (for instance it is also used to refer to open access to science and scholarship[17]), and should not be used in when setting requirements for the 700 Mhz spectrum auction.

20. The consultation document asks for input on requirements that wireless network users be allowed to connect any device of their choosing to the network, and that application developers and users be allowed to use applications of their choice on the network. We support this requirement for open platform standards, and suggest that it be referred to in these terms (Open Platform Standards). Restrictions that restrict user and developer access to wireless networks with the devices and/or applications of their choice limit innovation and constrain consumer choice.[18] Open standards must be enabled to support increased competition and to foster innovation.

Part Two: The Canada Broadband Portal

21. This part of our submission on the 700 MHz spectrum auction is not in response to a specific question from the consultation paper but is a reply to the call for comments on general policy considerations related to commercial mobile broadband spectrum use.[19] What we propose is allocating 10 MHz (2 five MHz blocks is the spectrum allotment currently required to send and receive for new mobile devices) of the Canadian 700 MHz spectrum for a limited access (or 'walled-garden') government broadband portal. This *Canada Broadband Portal* (CBP) would provide all Canadians with access to key government services at all times in all places, regardless of whether or not they choose to pay for the service of a commercial wired or wireless internet service provider. To the best of our knowledge, this system does not exist in other jurisdictions and could make Canada an innovator in broadband development. The development of the Canada Broadband Portal should take place as a central component in a broader digital strategy.

22. The International Telecommunication Union's (ITU) Broadband Commission for Digital Development argues that "the social and economic development of every country on earth will depend on equitable and affordable access to broadband networks for all citizens." It observes that:

> Policy leadership and political willpower at the highest level are fundamental to promoting the deployment of broadband networks and development of content and ICT skills. Those countries that have succeeded in rolling out broadband networks and integrating them into their economic and social fabric have done so not necessarily on the back of vast wealth or huge investments, but on the basis of early and consistent prioritization of broadband at every level of policymaking. The most successful adopters of broadband (including Japan, the Republic of Korea and Scandinavian countries) were quick to recognize broadband as a national priority needing separate and steady investments, in addition to investments in the broader telecommunication domain.[20]

23. The ITU reports that as of 2010, 82 countries around the world have implemented or are planning a national broadband strategy, and more than 40 have included broadband in their universal access provisions.[21] Despite initiating discussions about "moving forward" with a digital economy strategy for Canada in 2009,[22] and launching a formal consultation process in 2010,[23] Industry Minister Tony Clement has yet to deliver a digital strategy for Canada. We believe that the 700 Mhz auction should be guided by a broader policy framework that addresses the development of Canada's broadband infrastructure. In the absence of such a framework, we make the case for the Canada Broadband Portal as one means of delivering broadband access to all Canadians.

24. The Canadian government has described broadband networks as "a critical component of the digital economy, enabling a range of new applications that include social media, video conferencing, new e-health applications and smart electrical grids."[24] Industry Canada has described broadband connectivity as essential, noting that broadband can "expand opportunities in many sectors of the economy and will become an important tool for healthcare, education and access to government services."[25] The proposed Canada Broadband Portal will help Canadians realize the potential of broadband connectivity, by extending mobile access to government services to all Canadians.

25. In 2009, the CRTC wrote in a key ruling on internet traffic management:

> Governments around the world are taking actions intended to establish the Internet as a fundamental part of society and a preferred means by which citizens engage with one another. Information and communications technologies are expected to be used increasingly to support health care, to provide educational opportunities, to connect and foster communities, to support cultural activities, and to facilitate trade and commerce.[26]

26. This statement echoed the 2006 Final Report of the Telecommunications Policy Review Panel which emphasized:

> The Panel believes certain key social objectives will remain a priority for Canadians as telecommunications becomes an increasingly important enabler of economic and social activities, and an increasingly critical infrastructure for the delivery of government and public services such as health and education.[27]

27. A vision of using broadband technologies to deliver services to Canadians was articulated by the 2001 National Broadband Task Force, which had the principal mandate of preparing "a strategy for achieving the Government of Canada's goal of ensuring that broadband services are available to businesses and residents in every Canadian community by 2004."[28] This task force built on the work done by the Information Highway Advisory Council in the mid to late 1990s,[29] and was motivated in part by the federal government's goal of "making the information and knowledge infrastructure accessible to all Canadians, thereby making Canada the most connected nation in the world."[30]

28. Canada has not become the most connected nation in the world, and is no longer a leader in the development and use of broadband infrastructure. The objective of the proposed Canada Broadband Portal is to extend essential broadband connectivity to all Canadians, allowing them access to government services so that they may accrue the socio-economic benefits of broadband even without a commercial internet connection.

29. In early 2011, Canadian media has been filled with stories concerning internet capacity. A CRTC decision that would have forced independent ISPs using Bell's wholesale services to cap their customers' internet usage is currently under review.[31] The general industry consensus is that pressure on ISP infrastructure increases exponentially as on-line video and other high data services become more popular. In an earlier hearing, major ISPs told the CRTC that some traffic management is necessary to ensure efficiency of their networks.[32] However one views this debate, it is apparent that pressure on internet networks is a growing concern.

30. The CBP ensures that Canadians, wherever they are in the country, and whatever future pressures on internet infrastructure may bring, will always have efficient access to important services. If broadband is indeed a "fundamental part of society" as stated by the CRTC and if the quality of this service is being threatened by exponential growth, it is important to consider the fundamental elements of internet access. These elements must be accessible to Canadians regardless of the inevitable tremors felt within the private sector.

31. The Canada Broadband Portal proposal sets aside a portion of the 700 MHz spectrum for use to provide Canadians with access to government services but still allows for robust private sector development. This spectrum allocation may be subject to change as compression technologies evolve. The CBP would not provide access to the wider internet but would be a streamlined, government-run access point for a range of services deemed to be in the public interest. The Portal would be a Tier One service, meaning it would have national coverage and be available to all Canadians via wireless, tablet computers, and smart phones. The Canada Broadband Portal would allow easy access to services from any mobile device.

32. We believe our proposal is in accordance with the objectives stated in Part 1 section 7 of the *Telecommunications Act*,

> 7. It is hereby affirmed that telecommunications performs an essential role in the maintenance of Canada's identity and sovereignty and that the Canadian telecommunications policy has as its objectives
> (a) to facilitate the orderly development throughout Canada of a telecommunications system that serves to safeguard, enrich and strengthen the social and economic fabric of Canada and its regions;[33]

It is with this core concept of safeguarding, enriching, and strengthening Canadian sovereignty that we propose the creation of the Canada Broadband Portal. At its core, our proposal seeks to address the central question: what are the essential public interest objectives involved in the 700 MHz spectrum auction and how can they best be achieved?

33. If licenses are indeed to be expanded from 10 to 20 year terms (which we oppose) it is essential that the auction of the 700 MHz spectrum be conducted with long-term perspective for public benefits beyond a one-time infusion to public coffers. Now is the moment for creative long-term planning. However wireless communications evolve in the coming decades, Canadians must be assured of certain essential digital services no matter where they reside or whether or not they choose to subscribe to an ISP. It is no longer a matter of all households having access to communication services, as was the case with the rise of the telephone, television, and early internet access; to be truly "public" in the 21st century means services must be available via digital mobile devices regardless of location. To lose connection with certain core services is to deny one the full benefits of Canadian citizenship. Vital public services must be protected.

34. As academics, our focus extends beyond commercial benefit for spectrum use, yet as political economists we recognize the important role played by private investment in developing Canadian communications infrastructure. This is why we see the CBP as a walled garden closed application: it should complement, not compete with, Canada's growing internet infrastructure. Around the world, governments are promoting the necessity of strong digital infrastructure as a key component for not only economic development, but also the "public institutions" and "social benefits" as described in the Industry Canada consultation paper.[34] A common problem arises when vast amounts of public revenue are

invested in broadband infrastructure, only to see private corporations reap enormous financial rewards by using this technology to deliver entertainment services, usually high definition streaming video. As Blair Levin of the Communications and Society Program at the Aspen Institute said to the International Institute for Communications in Ottawa in Nov, 2010: “We can’t justify supplementing HD” (referring to high definition television programming). If Canadians wish to subscribe to enhanced broadband services including the streaming of HD video, the private sector should be given ample opportunity to provide those commercial services.

35. The genesis of the Canada Broadband Portal concept came from a range of speakers at the 2010 meeting of the Canadian Chapter of the International Institute of Communications. It was here that Minister Clement announced the 700 MHz auction for 2012. Among the key points from other speakers was one made by Google’s Richard Whitt who encouraged a new approach to internet economics and emphasized that markets and governments need not be antagonistic entities. We believe the Canada Broadband Portal is a public venture that still recognizes the role of the private sector. There is very little overlap of services.

36. It was also at this meeting that Minister Clement announced that the government would be reviewing foreign ownership policies in the near future. Since that speech, momentum has been building in media outlets calling for the government to ease foreign ownership policies. It is not our purpose in this submission to take sides in this debate; however, one of the traditional reasons for foreign ownership restrictions has been the issue of the national sovereignty of Canada’s communication infrastructure. We believe the Canada Broadband Portal will keep essential elements of this Nation’s on-line services solidly in Canadian hands.

37. Precisely what would form the content for this portal can be subject to further consultation and we have every belief that it will evolve over time. The key stipulation is that this should be a non-commercial service, supported by Canadian public funds. If handled correctly, this portal could reduce overall government expenditures by streamlining service and reducing duplication. More importantly, it assures all Canadians have constant access to essential public services. Using the key issues as identified in the American National Broadband Plan, the Canada Broadband Portal would be a new and necessary conduit for civic engagement, education, health care, the environment, government performance and public safety.[35]

38. Among the potential services to be offered on the Canada Broadband Portal, we forsee:

- A wide range of government services at the federal, provincial and municipal level.
- Service Canada
- Basic e-health services such as on-call nurses.
- On-line language courses and other educational services.
- Community access.
- Weather reports from environment Canada.
- Road conditions.
- National and provincial park access
- Essential tourist information.

39. We recognize the wide scope of this proposal. However the time has come for bold initiatives. The 2010 Harvard study which justly criticized Canada's broadband development noted that Canada is "not a case of regulatory abstention but of regulatory hesitation".[36] There are logistical difficulties in establishing a project like the Canada Broadband Portal,

but these challenges pale in comparison to the obstacles faced by previous generations in establishing successive national communications projects in Canada. The system should be structured on a Long-Term Evolution (LTE) fourth generation wireless platform which can offer speeds of 100 Mbps, lower latencies, and seamless handovers between sites. We realize that this new national service will require years of development which is why the Canadian government should plan to use the best technology available at present. Such forward thinking policy is the hallmark of effective governance and will offer long-term benefit.

40. It may be possible that the Canada Broadband Portal could be constructed in tandem with new public safety infrastructure as outlined in section 5 of the consultation paper. Emergency responders have been vigorously lobbying for spectrum for what they refer to as "mission critical" requirements.[37] Canadian police, fire, medical and other emergency professionals have asked for priority access on dedicated spectrum, arguing it is in the best interest of public safety communication to utilize the same frequency band country-wide for interoperability of equipment. This would also be a suitable infrastructure for the CBP and it could be designed so that emergency responders hold priority access when required. This way two major national projects could be constructed on the same band of spectrum. Building and management of broadband networks across the country can be achieved in collaboration with industry – possibly via public/private partnerships and using tower-sharing as much as possible. Tower-sharing was also specifically mentioned by Minister Clement in his November 2010 speech as a cost-saving measure worth exploring.

Conclusion

41. Our submission has addressed specific elements of the 700 MHz auction that we believe are necessary for long term growth and innovation in the wireless broadband sector. After decades as a monopoly and then oligopoly, the Canadian telecommunications market will not offer true competition without clear policy initiatives by the Canadian government. The status quo will not suffice if Canada is to prosper in the digital economy.

42. Therefore we recommend the use of both spectrum set-asides and spectrum caps in the 2012 700 MHz auction - these methods encourage new entries in a sector that has resisted change for far too long. Also, to spur on true growth and innovation, we have requested the spectrum license term be kept at the ten year period as outlined in the 2001 *Framework for Spectrum Auctions in Canada*. This sector evolves far too quickly to allow any one non-public entity exclusive rights for a 20 year period. It is also in Canada's best interest to make certain valuable spectrum is used, and not purchased and warehoused for strategic gain. For this reason we request set limits for licensees to begin offering services or risk losing their spectrum. We also endorse the principle of open access on all platforms, but note that the "open access" descriptor is problematic and suggest it be replaced with "open platform standards."

43. The new direction recommended in this proposal is the creation of a wireless public services access network called the Canada Broadband Portal. This initiative calls for a freely accessible walled-garden wireless service which would allow all Canadians to reach key public services via laptop, phone or tablet computer anywhere in the country. The costs of the Canada Broadband Portal may be lessened by sharing spectrum with emergency responders, who would retain priority access when they require use of the spectrum. We

recommend tower sharing with established communication providers to avoid unnecessary duplication of hardware.

44. The purpose of our proposal is to instigate discussion, not provide a thorough blueprint. At its core, our proposal seeks to reinforce the place of public service in Canada's digital future.

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